

Pressure Systems Policy

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Summary

Purpose of Policy

This policy is designed to ensure the safe purchase, installation, use and maintenance of pressure systems in operation at the University of Portsmouth. This policy is intended to ensure that the University is compliant with current legislation and sets out procedures on how to achieve a safe environment for University staff, students, contractors and visitors.

Who is this Policy for?

This policy is intended for all University staff and students as well as visitors and contractors, who may be required to work with Pressure Systems, (or frequent areas where they are in use), whilst on University owned and controlled property.

How does the University ensure the Policy is implemented?

The Health & Safety Office together with Estates & Campus Services monitors results from inspections of all University buildings and property, accident and incident data, as well as feedback from staff and students. This includes monitoring the implementation of control measures and procedures identified in risk assessments for the installation, maintenance and use of pressure systems. Results from audits of procedures, risk assessments, accident and incident data, as well as feedback from staff and students are utilised to ensure continual improvement.

This Policy and associated procedures and documentation are subject to internal audit.

Who can you contact for enquiries about this Policy?

Any questions about this Policy should be directed to the Health & Safety Office and Estates & Campus Services.

Introduction

A pressure system is a closed system designed to hold steam at any pressure, any fluid or mixture of fluids which is at a pressure greater than 0.5 bar above atmospheric pressure or a gas dissolved under pressure in a solvent (e.g. acetylene).

Pressure systems used at the University include: steam boilers, autoclaves, pressurised storage vessels for cryogenic liquids and compressed gas distribution systems.

Pressure equipment failures can kill or seriously injure users as well as people nearby and cause serious damage to property.

Note: The term 'fluids' includes gases and liquids which are capable of exerting a vapour pressure. They do not include hydraulic oils. Hydraulic systems, whilst using high pressures, do not store energy in the system and therefore are not classed as pressure systems.

Note: Gas cylinders (the legal term for them being transportable pressure vessels TPV) are covered by separate legislation ([The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009](#))

Legislation

The installation and use of pressure vessels requires compliance with 6 pieces of legislation:

[The Health and Safety at Work Act 1974 \(HASWA\)](#)

The University is required under section 2 of the Health and Safety at Work Act 1974 to ensure, so far as is reasonably practicable, the health, safety and welfare of employees whilst at work. This legislation includes a general duty of care to protect our students. These requirements are applicable to all work situations, including provision of a working environment that is safe and without risk to health.

[The Management of Health and Safety at Work Regulations 1999 \(MHSWR\)](#)

Requires the University to make suitable and sufficient assessment of the risks to the health and safety of employees whilst they are at work and to ensure the health and safety of third parties (i.e. students, visitors and contractors) arising out of, or in connection with University activity.

[The Pressure Equipment Regulations 1999 \(PER\):](#)

These Regulations apply to the purchase of pressure equipment; they enable the free trading of products within the EU by removing the need for separate documentation and testing for each individual European market. Manufacturers may use a single CE mark on their products to show compliance with these Regulations. The Regulations cover pressure equipment and assemblies with a maximum allowable pressure greater than 0.5 bar above atmospheric pressure (gauge pressure).

[The Pressure Systems Safety Regulations 2000 \(PSSR\):](#)

The aim of these Regulations is to prevent serious injury from the hazard of stored energy as a result of the failure of a pressure system or one of its component parts. To determine which regulations of the PSSR apply to a given system see Appendix 1.

[The Electricity at Work Regulations 1989 \(EAWR\):](#)

The EAWR 1989 places a legal responsibility on employers and employees, as duty holders, to ensure that electrical systems used at work under their control are safe. To achieve compliance with the legal requirements of the EAWR 1989 requires proof that an electrical system is safe, which involves amongst other things, proper inspection and testing of a system by competent people and the creation and maintenance of records.

[Control of Substances Hazardous to Health Regulations 2002 \(COSHH\)](#)

Requires the University to carry out suitable and sufficient assessment of the risks with work involving exposure to hazardous substances. Where necessary the University should ensure that exposure of staff, students, visitors and contractors to substances hazardous to health is either prevented or, where this is not reasonably practicable, adequately controlled.

COSHH however does not cover flammable and explosive substances, lead and lead salts, asbestos and radioactive substances which are only harmful by nature of their radioactivity. These substances are subject to separate pieces of legislation.

[The Provision and Use of Work Equipment Regulations \(PUWER\) 1998](#)

Applies to all work equipment. The regulations require that:

- Work equipment is suitable for the purpose it is used or provided for, and is properly maintained and inspected at suitable intervals
- Where the use of work equipment is likely to involve specific risks, the use, maintenance etc. of that equipment is restricted to people given the task of using and/or maintaining it
- Users, supervisors and managers have received adequate training for the purposes of health and safety

Responsibility

Areas of responsibility are defined in the University Health and Safety Policy. This Policy forms part of the University's Health and Safety Policy and disciplinary action may be taken as a result of non-compliance.

The Heads of Departments, professional services or equivalent, who own pressure systems and/or equipment are responsible for ensuring they are fit for purpose and installed, operated and maintained competently and safely.

The Estates & Campus Services Department is required to retain an up to date inventory of all pressure vessels and systems in use within the University. This is achieved by notification via the [Pressure Systems registration form](#).

Estates & Campus Services should be consulted prior to procurement of any system so that written schemes of examination can be devised and the necessary follow up arrangements can be put in place. For autoclaves, Estates & Campus Services should be consulted to ensure that the necessary building services are in place.

Arrangements for Managing Health and Safety

Purchase and installation of new or pre-owned pressure systems

In order to comply with the [PSSR](#) when purchasing and installing new equipment or pre-owned equipment, it must be ensured that it is suitable for its intended purpose and that it is installed correctly by a competent installer. This requirement can normally be met by using the appropriate design, construction and installation standards and/or codes of practice. Since 2002, most pressure equipment placed on the market has had to meet the requirements of the [PER](#). For pressure equipment not covered by the [PER](#), the more general requirements of the [PSSR](#) apply.

Regulations 4 to 7 of the PSSR apply to manufacturers, importers and suppliers of pressure systems. Staff involved in the purchasing of pressure systems should be aware of the requirements of these regulations. This is particularly important if the pressure system has been pre-owned. In summary these are:

[Regulation 4](#) Design and construction

This regulation places duties on designers, manufacturers and any person who supplies equipment or a component intended to be part of a pressure system to ensure that it is fit for purpose, so as to prevent danger.

[Regulation 5](#) Provision of information and marking

The aim of this regulation is to ensure that adequate information about any pressure system subject to PSSR is made available to users/owners by designers, suppliers or those who modify or repair equipment. Basic information about pressure vessels should be permanently marked on the vessel, including the Safe Operating Limit.

Regulation 6 Installation

“The employer of a person who installs a pressure system at work shall ensure that nothing about the way in which it is installed gives rise to danger or otherwise impairs the operation of any protective device or inspection facility.”

Regulation 7 Safe operating limits

The designer, manufacturer and supplier are responsible for providing adequate information about the system or its component parts. It prohibits the user/owner from operating the system or allowing it to be operated before the safe operating limits have been established.

Safe operation and maintenance of pressure systems equipment

In order to operate and maintain pressure equipment the following [PSSR](#) must be complied with.

Regulation 8 Written scheme for periodic examination

If a pressure system contains steam at any pressure or has a relevant fluid at a stored pressure above 0.5 bar and has pressure x internal volume of greater than 250 bar litres or more, a written scheme of periodic examination must be in place. The scheme must state the nature and frequency of the examinations and specify any extra measures necessary to prepare the system for safe examination and, where appropriate, must provide for the examination to be carried out before the system is first used.

The HSE's publication [Written Schemes of Examination, Pressure Safety Systems Regulations 2000](#), includes a list of typical pressurised systems that are likely to require a written scheme of examination.

The scheme must be drawn up by a competent person who is normally an engineer appointed by the University's insurer; this can be arranged through Estates & Campus Services. It is important that the user of the pressure system liaises with the engineer so that he or she has clear understanding of how the system will be used and the environment in which it will be used. The presence of substances that may cause corrosion or weakening of the components of the system need to be taken into account when the scheme is drawn up.

Regulation 9 Examination in accordance with the written scheme

Line Managers and Senior Managers are responsible for ensuring that examinations in accordance with the [written scheme](#) are carried out. These should coincide with the annual maintenance, as the system may need to be stripped down for the inspector to access specific components.

Once a pressure system has been registered on PLANON using the [Pressure System Registration Form](#) automatic e-mail reminders will be sent out informing users when maintenance and inspections are due.

Regulation 10 Action to be taken in case of imminent danger

Concerns serious defects identified by the competent person whilst carrying out maintenance under the written scheme of examination. Serious defects are those that require immediate attention where there is a risk of imminent failure of the system, if immediate repairs are not undertaken or other suitable modifications are not made to the operating conditions. The competent person should immediately issue the user or owner of the equipment a written report identifying the system and detailing defects and arrange to remove the equipment from use, as well as any remedial action required.

Regulation 12 Maintenance

A suitable maintenance schedule is required in addition to examinations conducted under the written scheme. Suggestions for a suitable maintenance schedule are detailed in the [Approved Code of Practice, L122 Safety of pressure systems, PSSR](#). General requirements for equipment maintenance are also covered in the [Approved Code of Practice, L22 Safe use of work equipment, PUWER](#) for regulation 5 of PUWER.

Regulation 13 Modification and repair

“The employer of a person who modifies or repairs a pressure system at work shall ensure that nothing about the way in which it is modified or repaired gives rise to danger or otherwise impairs the operation of any protective device or inspection facility.”

Therefore all maintenance work must be carried out by a competent person.

Regulation 15 Precautions to prevent pressurisation of certain vessels

Regulation 15 states:

‘Paragraph (2) shall apply to a vessel:

(a) which is constructed with a permanent outlet to the atmosphere or to a space where the pressure does not exceed atmospheric pressure; and

(b) which could become a pressure vessel if that outlet were obstructed.

(2)The user of a vessel to which this paragraph applies shall ensure that the outlet referred to in sub-paragraph (a) of paragraph (1) is at all times kept open and free from obstruction when the vessel is in use.’

The purpose of this regulation is to prevent an unintentional build-up of pressure in a vessel which is provided with a permanent outlet to atmosphere, or to a space where the pressure does not exceed atmospheric pressure.

Arrangements for the safe disposal pressure systems and equipment

Pressure systems and/or equipment that are being disposed of shall be deregistered via the [Pressure Systems registration form](#).

Equipment must be made safe and if necessary decontaminated and disposed in accordance with the [University Recycling and Waste Management Procedures](#).

Control measures

Risk Assessment

Senior Managers shall ensure a suitable and sufficient risk assessment is conducted in order that effective controls are developed and implemented for the safe use of pressure systems they are responsible for. The risk assessment should identify risks in all areas where staff, students, visitors and contractors have direct contact with pressure systems and vessels.

Senior Managers shall ensure that suitable and sufficient risk assessments are conducted for all planned maintenance and reactive work undertaken and that staff and contractors carrying out the work are competent to do so and aware of all potential risks.

Operation

Senior Managers shall ensure that newly purchased pressure systems or pressure systems requiring disposal are registered using the [Pressure System Registration Form](#).

If pre-owned equipment is purchased or received as a donation it must be thoroughly assessed and safety tested by a competent person, who is normally an engineer appointed by the University's insurer. These systems must also be registered using the [Pressure System Registration Form](#).

Senior Managers are responsible for ensuring that only competent persons operate pressure systems equipment and that operatives understand the safe operating limits of the equipment. Operatives must be competent with start-up and shut-down procedures including emergency procedures and the appropriate use of any safety devices.

Inspection, Maintenance and Testing

Senior Managers are responsible for ensuring a suitable written scheme for examination of pressure systems is drawn up or certified by a competent person and that examinations and maintenance are carried out by a competent person at the intervals set down in the scheme.

The pressure system shall be maintained in good repair and adequate records kept for inspections, testing and maintenance carried out.

Information, Instruction, Training and Supervision

Regulation 11 Operation

“(1) The user of an installed system and the owner of a mobile system shall provide for any person operating the system adequate and suitable instructions for:

- (a) the safe operation of the system; and*
- (b) the action to be taken in the event of any emergency”*

There is an additional training requirement under regulation 9 of [PUWER](#) to ensure employees are provided with sufficient information, instruction and training. Senior Managers must ensure that training is provided to all those involved in the operation, maintenance, examination, etc. of pressure systems and equipment.

An outline of the content of the training is given in the [Approved Code of Practice, L122 Safety of pressure systems, PSSR](#).

Record Keeping

The Health and Safety Office at the University of Portsmouth administers a computer based record system of all data gathered during workplace inspections and audits. Complaints and feedback from staff and students are also recorded.

Regulation 14 Keeping of records

Places a duty on the user of an installed system and the owner of a mobile system to keep maintenance and inspection records. The results of periodic examination are kept on the University insurers data base ‘Crimson’.

Full information on the recording examination and maintenance is given in the [Approved Code of Practice, L122 Safety of pressure systems, PSSR](#).

Estates & Campus Services stores records of examination and maintenance reports (including examinations carried out under the written scheme) for all pressure systems in operation, owned and maintained by the Estates & Campus Services Department. Records are stored within Schools and Departments for pressure systems they own and maintain.

Thorough inspection records are stored on the Crimson Register which is operated and maintained by the Competent Person (Zurich Inspection Engineer).

Competency training records for University of Portsmouth staff operating or maintaining pressure systems are retained by the Faculty, Department or equivalent responsible for providing the training.

Equality and Diversity

The University's Equality Analysis Impact procedure was used in the development of this Policy and is available on request.

This Policy is subject to review to ensure it is used appropriately and that it meets with the University's commitment to equality and diversity.

Further Information

To find out how the Pressure Systems Safety Regulations 2000 Regulations apply to your pressure system, see Appendix 1.

The meaning of the terms used in this policy can be found in the [Technical Guidance Note WE02 - Pressure Systems Glossary](#).

External Sources

Health and Safety Executive: [INDG178: Written Schemes of Examination, Pressure Systems Safety Regulations 2000](#).

Health and Safety Executive: [L122: Safety of Pressure Systems, Pressure Systems Safety Regulations 2000. Approved Code of Practice and guidance](#).

Health and Safety Executive: [L22: Safe use of work equipment. Provision and Use of Work Equipment Regulations 1998. Approved Code of Practice and guidance](#).

Health and Safety Executive: [ING229: Using Work Equipment Safely, Guidance for the Provision and Use of Work Equipment Regulations 1998](#).

Appendix 1: Chart to determine which Regulations apply to a given system



