

SAFE USE OF PRESSURE SYSTEMS POLICY

Date	Purpose of Issue / Description of Change	Equality Impact Assessment Completed
13 th Nov 2014	Initial Issue	
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Policy Officer	Senior Responsible Officer for Policy	Initially Approved By	Date of Initial Approval
Head of Health & Safety	Chief Operating Officer	Health & Safety Committee	12 th Nov 2014

This Policy will be reviewed in 2028

1. INTRODUCTION

Pressure is the amount of force exerted on a certain area and is a form of energy that, if handled incorrectly, can have devastating consequences. As such, pressure systems are controlled by the Pressure Systems Safety Regulations (PSSR), and other legislation as noted in Section 3.

The PSSR Regulations purpose is to prevent, control and mitigate the risks from stored energy were there a failure of a system or part of it and applies to applicable pressure system and all associated protective devices, such as regulators and some pipe work.

It is essential that robust procedures are in place to ensure systems are safe to operate, with subsequent maintenance, inspections and operations carried out by person(s) with the necessary skills and experience to safely undertake the task assigned.

Some systems, dependent on their nature, will also require formal examinations to be undertaken and a Written Scheme of Examination to be prepared (see Sections 6 & 7).

2. POLICY STATEMENT AND SCOPE

It is the policy of Bangor University, so far as is reasonably practicable, and in accordance with the relevant statutory requirements and good practice, to ensure the health and safety of staff, students, and visitors to the University.

This Policy states the requirements placed on the University and its Colleges and Professional Services regarding the identification, notification and subsequent use, inspection, and maintenance of workplace pressure systems.

The Policy applies to:

- The University and its Colleges and Professional Services.
- All pressure systems, as defined by the Pressure Systems Safety Regulations (PSSR).
- All other pressure systems that fall outside the scope of PSSR, but which are regulated through the Provision and Use of Workplace Equipment Regulations (PUWER).
- Transportable gas cylinders and pressure receptacles, as defined by the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations.
- Acetylene, as defined by the Acetylene Safety (England and Wales and Scotland) Regulations.
- Breathing gas cylinders (diving and emergency).

The Policy does not apply to:

- Systems under vacuum.
- Hydraulic systems.
- The content (e.g., toxicity / flammability) of the pressure system / vessel. A separate Risk Assessment will be required where necessary.
- Systems covered by the Medical Devices Regulations.
- Rented gas cylinders owned and certified by Suppliers.

3. RELATED POLICIES AND LEGISLATION

In addition, to those general duties in law, the University and its constituent Colleges and Services, have a specific obligation under the Pressure Systems Safety Regulations (PSSR) and relevant aspects of the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment

Regulations to ensure the suitability, safe use, examination, and maintenance of pressure systems / vessels and the Provision and Use of Work Equipment Regulations (PUWER).

4. DEFINITIONS / TERMINOLOGY

For the purpose of this Policy the following terms and definitions apply:

- **System:** Generic term used to describe any pressure system / pressure vessel.
- **Competent Engineer:** Person (Competent Person under PSSR) who is appointed by the University's Engineering Inspection provider (via the Insurance Officer) to undertake specific duties as defined in the PSSR, and where appropriate, to draw up, certify and formally examine systems against a Written Scheme of Examination and who produces the Insurance Provider's Engineer's Report.
- **Nominated Person:** Staff appointed to undertake the duties outlined in Section 8(h).
- **Technical Person:** Staff / supplier / contractor with the necessary skills and experience to undertake their role e.g., inspections, maintenance, installation, commissioning / decommissioning.
- **University Insurance Officer:** Located within the University's Finance Office. Person appointed to liaise with the University Engineering Inspection Provider and their Competent Engineer on notification of a relevant system by a College / Service.
- **Schedule:** Central database of all relevant PSSR University systems notified by a College / Service and maintained by the Insurance Officer.

As per PSSR a Pressure System / Vessel includes:

Term	What this Covers
Pressure	<ul style="list-style-type: none"> • Defined as: the normal force per unit area exerted by a moving fluid on a small body immersed in it if the body were carried along with the fluid. Si Unit is in Pascals (Pa) but referenced as Psi or Bar • Safe Working Pressure: the pressure level for which the system/vessel has been designed to operate at (sometimes referred to as Maximum Operating Pressure, MOP, or Maximum Allowable Working Pressure, MAWP). Measured as above Atmospheric Pressure
Relevant Fluid	<ul style="list-style-type: none"> • <u>All steam (at any pressure)</u> • Any gas or mix of gases at a pressure greater than 0.5 bar (above atmospheric) • Any liquid if it could turn into a gas with a pressure greater than 0.5 bar above atmospheric pressure • Hot water stored / contained above its boiling point at atmospheric pressure if a vapour pressure above 0.5 bar is created • Gas dissolved under pressure in a solvent at ambient temperature and which could be released without heating (e.g., acetylene)

Pressure System	<ul style="list-style-type: none"> • <u>All steam (at any pressure)</u> • The following if it contains a relevant fluid with a maximum allowable pressure greater than 0.5 bar (above atmospheric pressure): <ul style="list-style-type: none"> ○ A system comprising one or more pressure vessels of rigid construction, related pipe work & protective devices ○ Pipework with its protective devices which a transportable pressure receptacle is, or is intended to be, connected ○ Pipeline and its protective devices
Pipework	<ul style="list-style-type: none"> • Pipe or system of pipes and associated pressure containing components used to convey a relevant fluid e.g., valves, pumps, compressors, hose, bellows
Pipeline	<ul style="list-style-type: none"> • Pipe, system of pipes used to convey a relevant fluid • Components used to assist the flow of a relevant fluid through or via part of the pipe or system e.g., valves, compressors, other devices used to cause the gas to flow • Primary shut-off valve at each end of the pipeline
Protective Devices	<ul style="list-style-type: none"> • Devices designed to protect a system which contains or is liable to contain a relevant fluid against system failure or those designed to give warning of a failure (e.g., blow-off disc, pressure relief valve) • The term includes regulators

1 Bar = 14.504 PSI

5. DUTIES OF THE UNIVERSITY

The University will:

- Through this Policy and supplementary documents establish a management system that complies with legislation and controls associated with the safe use of pressure systems.
- Provide adequate resources to support the implementation of this Policy.
- Delegate, in line with the University's health and safety management system, the duty to implement this Policy to Heads of College and Directors of Professional Services.

6. NOTIFICATION TO THE UNIVERSITY INSURANCE OFFICER

In accordance with PSSR, some systems require a formal examination by a Competent Engineer. At the University this is arranged through the Insurance Officer who maintains the central Schedule of all relevant University systems notified by Colleges / Services.

To ensure the Schedule is up to date and the Competent Engineer is aware of systems requiring a formal examination, it is imperative Colleges / Services notify all new, redundant, and modified systems to the Insurance Officer using the PSR1 Form.

NOTIFICATION REQUIRED?	
<u>YES</u>	<ol style="list-style-type: none"> <u>All items containing steam</u> (above atmospheric) Pressure vessels and systems containing a relevant fluid other than steam with a pressure X volume product of 250 bar litre or more

	iii. 'Unusual' types of equipment that produce steam automatically under pressure e.g., autoclaves, pressure cookers, barista coffee machines iv. Hydrogenation Reactors / Bomb Calorifiers (safety devices), as applicable v. High-risk gas regulators, including corrosive gases, flammable and explosive gases, and oxygen vi. College / Service 'built / designed' systems meeting the criteria detailed above NOTE: <i>The Competent Engineer may need to prepare a Written Scheme of Examination <u>before first use</u></i>
<u>NO</u>	i. If the pressure of the relevant fluid (except steam) drops below 0.5 bar along the pipeline or pipework ii. If the pressure system (except steam) has a ' <i>pressure x volume</i> ' product less than 250 bar-litre (<i>if in doubt or where there is a heightened level of concern notify the item, and the Engineer will then advise</i>). Such systems are regulated by PUWER and should be risk assessed and inspected accordingly iii. Lower-risk gas primary regulators e.g. those attached to a transportable pressurised gas container or those designed to regulate the flow of a relevant fluid along a pipeline / pipework, for example, cylinders in an external cage that feed a relevant fluid to a laboratory, both directly and via a manifold. These should be inspected regularly and replaced in accordance with manufacturer's instructions, normally every 5 years. Note: regulators for flammable, oxygenation, corrosive and specialist gases must be notified iv. Secondary regulators i.e., those attached downstream to be inspected regularly

If in Doubt – 'Notify' the item and the Competent Engineer will advise

7. WRITTEN SCHEME OF EXAMINATION (WSE)

Some systems may require a formal 'Written Scheme of Examination' (WSE). The WSE is drawn up by a Competent Person and contains information about selected items of plant or equipment which form a pressure system, operate under pressure, and contain a relevant fluid or steam.

Once a system is notified as per *Section 6* the Competent Engineer (Competent Person) or Designer will, if necessary, produce the WSE. A copy of the WSE will be available to the Nominated Person.

8. COLLEGES / PROFESSIONAL SERVICE RESPONSIBILITIES

Each College and Professional Service is required to introduce and monitor systems to ensure the safe use of relevant systems under their direct responsibility. This includes ensuring:

- Competent suppliers are used to purchase, hire, install, commission / decommission systems.
- Systems are suitable for the environment to be used in, with advice sought from Campus Services or the Competent Engineer, where appropriate e.g. increased fire risk, structural loading concerns, lifting equipment needed to move a system.
- If required, WSE's are prepared by the Designer or Competent Engineer with the item not used until such time the WSE has been produced.

- d. Systems are clearly labelled e.g. Examination Labels, Safe Operating Limits (if required) displayed, piped gases clearly marked with their content and direction of flow.
- e. Only competent, authorised personnel operate systems.
- f. A Technical Person ensures systems are maintained and inspected as per manufacturer's requirements and those detailed in the WSE, where applicable.
- g. Systems are notified, as required, to the Insurance Officer.
- h. That a **Nominated Person(s)** (can also be the nominated Technical Person) is appointed, who will:
 - i. Notify new / redundant / altered College / Service systems (includes applicable regulators) to the University Insurance Officer, using the PSR1 Form, as required.
 - ii. Maintain a Log of PSSR systems and label all applicable equipment.
 - iii. Ensure all maintenance and inspections are undertaken by a Technical Person.
 - iv. Accompany the Competent Engineer and / or Technical Person (if required) whilst they examine, inspect, test and / or maintain systems.
 - v. Receive and maintain records of inspections, maintenance, Competent Engineer's Reports, Written Schemes of Examination and Safe Operating Procedures.
 - vi. Maintain lists of competent operators, as appropriate to the risk.
 - vii. Display and maintain an 'Authorised Users List' if required by the WSE or required due to the level of risk or complexity of the system.
 - viii. Check Examination Labels and Safe Operating Limits are affixed and are legible.
 - ix. Act upon actions or recommendations made by a Competent Engineer or Technical Person, arranging remedial works as required.
 - x. Ensure gas cylinders owned by Suppliers (e.g. *BOC, Air Products*) are certified by that Supplier and returned within the period of certification.
 - xi. Ensure all regulators (primary and secondary) are inspected regularly and replaced and / or serviced as indicated by the manufacturer's mark (normally every 5 years).
 - xii. Establish procedures to ensure systems cannot be used if faulty with relevant persons notified immediately if actions identified in (vii) could impact on their activities.
 - xiii. Ensure pressure equipment and systems that fall outside the scope of PSSR are suitably risk assessed, inspected and maintained in accordance with PUWER.
 - xiv. Ensure acetylene systems are risk assessed, installed are operated in accordance with Schedule 1 of the Acetylene Safety (England and Wales and Scotland) Regulations and University guidance, available on the Health and Safety Website.
 - xv. Ensure flammable gas systems and cylinders are assessed for risk of fire and explosion, in accordance with the University Fire Safety Policy and associated University health & safety guidance and the Dangerous Substances and Explosive Atmospheres Regulations.
 - xvi. Ensure that other associated risks, such as heat and hazardous substances, are suitably risk assessed and controlled as per relevant University policies and guidance.

For systems that are the responsibility of Campus Services and located within Colleges / Services, each College / Service must ensure they:

- i. Operate systems safely.
- j. Cooperate and communicate with Campus Services, e.g. provide safe access to systems, and do not make any modifications to those systems.
- k. Notify faults with the system to Campus Services, who shall address the risk promptly.

9. INSURANCE OFFICER RESPONSIBILITIES

The University Insurance Officer maintains a central 'Schedule' for University PSSR pressure systems as notified by Colleges / Services. In addition to maintaining this schedule, the Insurance Officer will:

- a. Update the 'Schedule' as necessary upon notification of new/redundant/modified systems.
- b. Inform the Engineering Inspection Provider and their appointed Competent Engineer of systems, and of system to be added, removed, or amended on the 'Schedule'.
- c. Ensure the Engineering Inspection Provider is supplied with contact details of the 'Nominated Person' to ensure Competent Engineer's Reports and relevant information is communicated (normally electronically).
- d. Communicate with Colleges / Services with regards to systems, as required.
- e. Periodically review / audit the 'Schedule' to confirm all applicable systems have been examined by the Competent Engineer as appropriate.

10. STAFF AND STUDENT RESPONSIBILITIES

As with those duties placed upon the University and its Colleges / Services, staff and students also have responsibilities in law and through this policy, and must:

- a. Follow all management controls implemented by their College / Service.
- b. Only use systems they have been instructed and / or trained and authorised to operate.
- c. Never move or connect transportable gas cylinders unless authorised and competent to do so.
- d. Not interfere with or mis-use systems in their work area.
- e. Immediately report defects with systems to a designated / nominated person.

11. EQUALITY IMPACT ASSESSMENT

This Policy statement and its associated guidance should have no detrimental impact on any person with a protected characteristic.

12. REVIEW AND AUDIT PROCEDURES

The central Health and Safety team will carry out general and periodic audits to ensure compliance against this or aspects of this Policy and applicable legislation.

Colleges/Professional Services must periodically review their own procedures to ensure the requirements of this Policy are implemented, suitable and effective.

The Health, Safety and Emergency Management Committee will review this Policy in accordance with the agreed Review Schedule, with any significant changes considered by the University Executive.

End.