



Pressure Systems

The Safety, Health and Welfare at Work (General Application) (Amendment) Regulations 2012 (S.I. No.445 of 2012).

Pressure systems are defined as “a system comprising one or more pressure vessels of rigid construction, any associated piping and protective devices and pressure accessories which contains or is liable to contain a relevant fluid.”

Examples of pressure system and equipment in NUI Galway include:

- Boilers and steam heating systems
- Pressurised process plant and piping
- Compressed air and gas systems, fixed and portable
- Pressure cookers, autoclaves, etc
- Vacuum systems and equipment (above 0.5 bar)
- Heat exchangers and certain refrigeration plant
- Valves, steam traps and filters
- Pressure gauges and filters
- Pressure relief and safety valves

Certain equipment is exempted (Part A of Schedule 12) because of reasons of practicality, lack of incident history or because it's safety is addressed by other legislation.

Principal causes of incidents include:

- Poor equipment and/or system design
- Poor maintenance of equipment
- An unsafe system of work
- Operator error, poor training/supervision
- Poor installation
- Inadequate repairs or modifications

The main hazards are:

- Impact from a blast or explosion or release of a compressed liquid or gas
- Impact from parts of equipment that fail
- Contact with released liquid or gas
- Fire resulting from escape of flammable liquids or gases

The level of risk from the failure of pressure systems and equipment depends on a number of factors:

- The pressure in the system
- The type of liquid or gas
- The suitability of the equipment and pipework
- The age and condition of the equipment
- The complexity and control of its operation
- The prevailing/working conditions (e.g. temperature)
- The skills and knowledge of those who design, install, operate, maintain and inspect the equipment and systems.

These regulations require the following:

Regulation 186 applies to the design, construction and safe operating limits of a pressure system/equipment. It requires, apart from the elements of good construction, sound materials, quality, etc., that the system/equipment is properly used and maintained, that safe operating limits have been set and that information on the limits is available. The regulation also requires that each pressure vessel is marked in accordance with very specific information including manufacturer's name, vessel serial number, date and standard of construction, and maximum (and minimum, where relevant) allowable pressure and temperature (where relevant). This regulation also states that any pressure vessel must not be operated or be allowed to operate beyond its safety limit.

Regulation 187 applies to the installation of pressure equipment/systems, and puts obligations on the installer to ensure that the installation is safe and that safe operating devices are not compromised in the installation.

Regulation 188 specifies that marks, plates and labels on pressure equipment/systems shall not be removed or falsified.

Regulation 189 requires NUI Galway to take the necessary measures so that employees have adequate information and written instructions (if necessary) concerning the pressure equipment/systems' conditions of use, safe operation, abnormal occurrences, emergency measures, and experiential guidelines. It also requires that employees whether or not they use the equipment are made aware of the health and safety risks associated with pressure equipment/systems located at or near their workstation. Furthermore it requires that such equipment is not operated except in accordance with this information and instruction, and that any modifications or repairs made to the system be recorded and made known to the user before the system is returned to operation.

Regulation 190 concerns the maintenance of pressure systems, and requires that systems are depressurised as far as possible before work commences or that protection measures are put in place. It requires that a maintenance file is kept up to date. It also requires that a competent person is consulted where significant repairs in relation to pressure are required.

Regulation 191 deals with the examination of pressure systems and equipment. It deals with examination requirements for new and used fixed and portable/transportable equipment, systems and vessels. It also deals with intervals for examination of equipment in use pre and post new regulations as specified in Part B of Schedule 12. Units with pressure systems that have not previously been examined must contact the Statutory Examination Engineer (see "Resources" below) to arrange the required examination of all relevant equipment.

Regulation 192 deals with reports by competent persons who carry out examinations and tests on pressure equipment and systems. Part D of Schedule 12 gives precise criteria.

Regulation 193 concerns keeping records and registers. NUI Galway must ensure that records produced under Regulation 192 are kept for inspection by an inspector. It also requires that a register of pressure vessels is established, maintained and kept for inspection by the Health and Safety Authority Inspector or others. Where change of ownership of pressure vessels is made that all written records in respect of that vessel be given to the new owner. Each Unit must maintain a register of their pressure equipment under the following headings:

- Details of the equipment:
- Room in which equipment is located

- Equipment type and Description
- Make
- Distinguishing Number (Serial Number)
- Date of first use
- Date of last examination and testing.

See also Point 9 below under "Controls/Arrangements". Most of the Register details will be addressed in the Statutory Examination Engineer's own Schedule of Examinations that will be appropriately passed onto the relevant NUI Galway Units.

This register can be in electronic or printed format and needs to be available at the point of use. The objective of the register is as stated in the HSA Guide "so that one can tell at a glance the scope of equipment for examination and its current status".

Regulation 194 deals with the duties of those who hire out pressure equipment. This may include compressed gas cylinders.

Controls/Arrangements

1. Provide safe and suitable equipment. New pressure equipment must comply with appropriate design, construction and installation standards and codes of practice. Pressure equipment must be installed and commissioned by competent persons. The pressure system or equipment includes all pipes, ducts, valves, vessels, etc. which are part of the system.
2. Ensure that any required examinations are carried out on new equipment, at the required intervals and documented; and
3. Ensure there are written operating instructions (such as an SOP) for the system, and for the control of the whole system including emergencies.
4. Fit suitable protective devices and ensure they function properly. These include devices fitted to vessels, pipe work, such as safety valves and electronic devices which cause shutdown when certain parameters or conditions are exceeded. Ensure that only authorised and competent persons set protective devices.
5. Carry out suitable maintenance. A maintenance programme must be in place and documented, taking account of the age of the equipment and system, its uses, and its working environment.
6. Make provision for appropriate training. Everybody operating, installing, maintaining, repairing, inspecting and testing pressure equipment must have the necessary skills and understanding to conduct their job or research safely.
7. Have the equipment examined by a competent person. Statutory examinations are legally required for most pressure systems, apart from certain exemptions.
8. The competent person must have the necessary skills, knowledge, experience and qualifications and must comply with IS EN ISO/IEC 17020:2004 the standard for in-service inspection of pressure equipment. This service is organised through the NUI Galway insurance broker see "Resources" below for more details. These reports must be kept for 5 years.
9. Each Unit to keep a copy of the Register and the Reports of Examination (as supplied by the Statutory Examination Engineer) together with a simple log book, either paper based or on-line, for observing incidents, malfunctions and other matters that may or will affect the health and safety of other persons'.
10. Review and update the risk assessments related to pressure equipment and pressure systems. Notify Statutory Examination Engineer (see "Resources" below) of any pressure equipment or pressure systems that may require statutory examination and relevant changes.

The Head of each Unit with relevant pressure systems needs to include an entry in Part C - Organisation of their Unit Safety Policy Statement (or equivalent), where they state the number of pressure systems, that the examinations are up to date and who is responsible in that Unit for ensuring that the register and records are kept.

Persons responsible

- Heads of Units
- Director of Physical Resources, as delegated to relevant Manager and/or Supervisor;
- Technical Personnel (equipment use);
- All Staff (reporting defects).

Resources

The Safety, Health and Welfare at Work (General Application) (Amendment) Regulations 2012. These can be accessed at <http://www.attorneygeneral.ie/esi/2012/B29145.pdf>

HSA Guide to Pressure Systems at

http://www.hsa.ie/eng/Publications_and_Forms/Publications/General_Application_Regulations/General_Application_Regulations_Pressure_Systems.pdf

The NUI Galway Website provides further information on the Statutory Examination Engineer, the [Statutory Examination Process](#) for pressure systems (see flowchart) and Unit/Site contacts.

The following related legislation and information should also be consulted:

- a. The Machinery Directive (European Communities (Machinery) Regulations 2008) (S.I. No.407 of 2008) <http://www.irishstatutebook.ie/2008/en/si/0407.html>
- b. The Safety Health and Welfare (General Application) Regulations 2007 (S.I. No.299 of 2007) <http://www.irishstatutebook.ie/2007/en/si/0299.html> particularly Chapter 2 - Use of Work Equipment.
- c. Part 5.4 (Work Equipment Standards) of the NUI Galway safety statement.

App. 1 Pressure Systems – Statutory Examinations (SE) flow chart

Units with any such equipment to contact HSB Engineering to arrange the statutory examination (SE) of the required equipment (Reg. 191). This also applies to any new equipment that Units subsequently acquire (post commissioning)*.

Units are also responsible for ensuring:-

- ✓ the proper use and maintenance of such equipment (Reg. 190) and all necessary records (Reg. 186, 193);
- ✓ new pressure systems must be commissioned* (Reg. 187);
- ✓ equipment must be properly marked up (Reg. 188);
- ✓ maintain a register of pressure equipment and have available for inspection (Reg. 193).

SEs are carried out by HSB Engineering (Reg. 192)

HSB Engineering send the report of the SE to Unit site contact (emailed with access to Portal and also hard-copy version).

HSB Engineering send the report of the SE to the Health and Safety Authority where cessation in the use of the pressure system is required or repairs/modification for its safe use required (Reg. 192(2)). Known as an "Immediate Defects Notice". HSB Engineering also notifies NUI Galway Safety Office.

Unit site contact complies with the reports requirements ((Reg. 192) and the provision of information to relevant employees (Reg. 189).

The future SE due will be scheduled by HSB at the required interval. If there's any significant delays (1 month+) in this re-examination the Unit Site contact to follow-up with HSB directly.

Unit Head/Site Contact to inform HSB and the NUI Galway Safety Office when a pressure vessel is no longer in service and to attach signage to state that the equipment is no longer in service.