

Relevant Legislation

Pressure Equipment Regulations 1999

Pressure Systems Safety Regulations 2000

Provision and Use of Work Equipment Regulations 1998 (PUWER 98)

Pressure Systems - Guidelines on Periodicity of Examinations 2003 (PSG1), published by the Safety Assessment Federation Ltd (SAFed)

General

Most establishments will need to be aware of the existence of these regulations, as they will have pressure systems on their sites. Pressure systems include:

- Boilers and steam heating systems
- Pressurised process plant and piping
- Compressed air systems (fixed and portable)
- Pressure cookers, autoclaves and retorts
- Heat exchangers and refrigeration plant
- Valves, steam traps and filters
- Pipework and hoses
- Pressure gauges and level indicators

The principal causes of incidents are:

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

The main hazards are:

- Impact from the blast of an explosion or release of compressed liquid or gas
- Impact from parts of equipment that fail or any flying debris
- Contact with the released liquid or gas, such as steam
- Fire resulting from the escape of flammable liquids or gases

The regulations differentiate between installed and mobile systems. For installed systems the user is responsible for compliance with the regulations, in the case of mobile systems the owner is responsible.

The regulations define three types of system:

- a system comprising one or more pressure vessel, its associated pipe work and protective devices.
- pipe work within its protective devices to which a transportable pressure receptacle is, or is intended to be, connected. A transportable pressure receptacle on its own is not a pressure system. Pipe work containing a relevant fluid (other than steam) at a pressure of 0.5 bar or less is outside the scope of the regulations
- a pipeline with its protective devices.

Relevant Fluid

Certain fluids identified as 'relevant fluids' are defined in the regulations. For a fluid to be a relevant fluid the following conditions must be fulfilled:

- (i) the pressure has to be greater than 0.5 bar above atmospheric pressure (other than steam). Where the pressure varies with time, then the maximum pressure that is normally reached should be the determining factor
- (ii) either the fluid should be a gas or mixture of gases under the actual conditions in that part of the system or a liquid which would turn into a gas if system failure occurred. This would, therefore, include compressed air and other compressed gases such as nitrogen, acetylene and oxygen. This would also include pressurised hot water or aqueous solutions where a vapour pressure above 0.5 bar (gauge) is generated.

The regulations place considerable duties on manufacturers, suppliers and installers of equipment in relation to design and construction, installation, provision of information and marking and establishing safe operating limits. Relevant information will need to be made readily available to the people who need it, including the competent person responsible for the examinations in accordance with the written scheme (see below).

Mobile systems

In the case of mobile systems the date of the next examination has to be marked on the system. It is important that every effort is made to ensure that examinations are carried out on such equipment.

Operation

It is important that those responsible for operating or maintaining the system:

- Know what liquid or gas is being contained stored or processed
- Know the process conditions, such as the pressures and temperatures
- Know the safe operating limits of the system and any equipment directly linked to it or affected by it
- Have ready access to a set of operating instructions for all the equipment and for the control of the whole system, including emergencies
- Have access to these instructions and are properly trained in the operation and use of the equipment or system.

Protective Devices

A protective device includes any protective control or measuring equipment which is essential to prevent a dangerous situation arising, this could include controls and instrumentation that would prevent safe operating limits being exceeded. Therefore it is important to ensure that the following points are fulfilled

- Ensure suitable protective devices are fixed to the vessels or pipe work
- Ensure the protective devices have been adjusted to the correct settings
- If warning devices are fitted ensure they are noticeable either by sight or sound
- Ensure that protective devices are in good working order at all times
- Ensure that where fitted protective devices, such as safety valves and bursting discs discharge, to a safe place
- Ensure that once set protective devices cannot be altered except by an authorised person.

Maintenance

The user of an installed system and the owner of a mobile system must ensure that the system is properly maintained in good repair so as to prevent danger. The type and frequency of maintenance should be assessed and a suitable maintenance programme planned. Any maintenance instructions provided by a manufacturer should form the basis of the maintenance programme. Maintenance is quite distinct from examinations required under a written scheme, however the results of examinations carried out under a written scheme may help inform the frequency of maintenance inspections.

The employer of a person who modifies or repairs a pressure system must ensure that such actions do not give rise to danger or otherwise impair the operation of any protective device or inspection facility.

The Building Manager will need to inform the Insurance Section and the Property Services Help Desk of any changes or additions to pressure systems.

Training

It is a requirement of the Provision and Use of Work Equipment Regulations 1998 (PUWER 98) that staff who operate pressure systems must receive appropriate information, instruction and training to ensure safe use. This training should include the special procedures to be followed in the event of an emergency.

Action in Case of Imminent Danger

Where there is a risk of imminent failure of the system if immediate repairs are not undertaken or suitable modifications made the competent person should notify the user/owner immediately so that appropriate action can be taken. Notification to the HSE within 14 days will also be necessary.

Written Scheme of Examination

The user of an installed system and owner of a mobile system must not operate the system or allow it to be operated unless a written scheme for the periodic examination has been produced by a competent person. It is the responsibility of the user/owner to ensure the scope of the scheme is appropriate, and to specify the nature and frequency of examinations and any special measures needed to prepare the system for examination.

A competent person must draw up the written scheme. In general terms the competent person should have:

- staff with practical and theoretical knowledge and actual experience of the relevant systems
- access to specialist services
- effective support and professional expertise within their organisation
- proper standards of professional probity.

The level of expertise will depend on the size and complexity of the system in question. For this reason pressure systems are divided into three categories, as follows: minor systems, intermediate systems and major systems.

Examinations should be carried out with sufficient regularity to ensure any deterioration or malfunction does not affect the safe operation of the system. Protective devices may need to be examined at more regular intervals. The competent person should determine the appropriate maximum interval between examinations using their judgement and experience whilst paying due regard to the guidance given in the SAFed publication cited above.

Although the duty in relation to carrying out the examination rests with the competent person, there is a clear duty on the user/owner to ensure that the equipment is not operated beyond the date specified in the current examination report.

The written report should be sent to the user as soon as is practicable after completing the examination, and within 28 days. This will reflect the actual condition of the system and will identify faults and the appropriate remedial action taken to repair them.

Arrangements within Each Directorate

Equipment subject to the regulations in premises solely occupied by Local Services (principally Depots) includes:

- Fixed equipment and plant, such as heating plant
- Portable equipment, such as compressors

These are discussed below:

Fixed Equipment (including Kitchen Equipment)

All fixed equipment is subject to a periodic examination by the County Council's insurers Zurich Municipal who have been appointed by the County Council as the competent person (body). All fixed equipment is automatically included in the inspection programme by Property Services.

Failures and suggested repairs are notified to Property Services for action. If necessary, the engineer will issue an urgent action form to the manager of the establishment at the time of the inspection. If there is a risk of imminent danger this will require immediate disconnection of the equipment to prevent further use. Alternatively, the form will suggest other appropriate action, depending on the severity of the defect. Subsequently, a report is issued via the Insurance Section and an action plan circulated to the person/directorate responsible to implement the engineer's recommendations

Portable Equipment

Autoclaves, pressure cookers and air compressors are also subject to a periodic examination by a competent person.

Information about this equipment is presently held on a historical database kept by Zurich Municipal. It is the responsibility of the establishment to notify the Insurance Section at County Hall of any new equipment purchased or old equipment disposed of. The Insurance Section will then arrange for the Zurich Municipal to amend the database.

Zurich Municipal will make arrangements with the establishment to carry out the necessary examinations and will also send the establishment the relevant certification for the equipment.

Failures and suggested repairs will be notified to Property Services for action. The Manager is responsible for arranging repairs should the equipment fail the examination. The Senior Statutory Maintenance Engineer (Property Services) will assist any establishment wishing to arrange such repairs.

The Health and Safety Team is available to provide further guidance and advice on any proposed procedures.

Prior to publication/implementation all proposed procedures must be discussed with the lead contact Health and Safety Officer via the appropriate Directorate/Divisional Safety Group. This step is necessary to verify that there is no variance with the legislation on which the policy is based.