

From the HSE: <https://www.hse.gov.uk/toolbox/pressure.htm>

Pressure equipment

Many types of pressure equipment can be hazardous. These include steam boilers and associated pipework, pressurised hot-water boilers, air compressors, air receivers and associated pipework, autoclaves, gas (e.g. LPG) storage tanks and chemical reaction vessels.

When things go wrong, these types of equipment can cause serious injuries and even fatalities. However, assessing the risks and putting proper precautions in place will minimise the chances of any accidents occurring.

Case Study:

A company used a steam boiler in its manufacturing processes. An alteration to pipework inadvertently caused salty water to be introduced into the boiler.

The resulting build-up of scale caused its furnace to overheat and collapse internally, creating an explosion. This blew out the ends of the boiler house and the ejected boiler demolished an electrical substation hundreds of feet away before coming to rest.

How the accident could have been prevented

This accident could have been prevented by giving the maintenance staff correct information and instruction, and by adequately managing the maintenance operation.

As a result of the damage to the building, its contents and exterior damage, the company had to replace the boiler and rebuild the boiler house, with significant loss of production.

Why is pressure equipment safety important?

If a piece of pressure equipment fails and bursts violently apart, the results can be devastating to people in its vicinity.

Parts of the equipment could also be propelled over great distances, causing injury and damage to people and buildings hundreds of metres away.

What do I have to do?

Assess the risks

Although the office do risk assessments you need to do an onsite dynamic risk assessment on the day. Things change from the site visit, and you are responsible for you own health and safety as well.

You need to assess the levels of risk when working with pressure equipment. The level of risk from the failure of pressure systems and equipment depends on a number of factors including:

- the pressure in the system
- the type of liquid or gas and its properties
- the suitability of the equipment and pipework that contains it
- the age and condition of the equipment
- the complexity and control of its operation
- the prevailing conditions (e.g., a process carried out at high temperature)
- the skills, knowledge and experience of the people who maintain, test and operate the pressure equipment and systems

Basic precautions

To reduce the risks, you need to know (and act on) some basic precautions:

- Ensure the system can be operated safely, for example without having to climb or struggle through gaps in pipework or structures
- Be careful when repairing or modifying a pressure system. Following a major repair and/or modification, you may need to have the whole system re-examined before allowing the system to come back into use
- Ensure there is a set of operating instructions for all of the equipment in the system and for the control of the system as a whole, including in emergencies
- There should be a maintenance programme for the system as a whole. It should take into account the system and equipment age, its uses and the environment in which it is being used

Written scheme of examination

A written scheme of examination is required for most pressure systems:

- This should be drawn up (or certified as suitable) by a competent person – someone who has the necessary skills, knowledge and experience to carry out the work safely
- It must cover all protective devices, every pressure vessel and those parts of pipelines and pipework which, if they fail, could be dangerous
- The written scheme 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
- Remember, a statutory examination carried out in line with a written scheme is designed to ensure your pressure system is suitable for your intended use. It is not a substitute for regular and routine maintenance

How can I do it?

- First of all, consider whether the job can be done another way without using pressure equipment, for example using vacuum equipment for cleaning rather than compressed air. If you have to use pressure equipment, don't use high-pressure equipment when low-pressure will do

- Ensure that you buy pressure equipment that complies with the relevant product regulations
- Before using pressure equipment, ensure that you have a written scheme of examination if one is required. Also make sure that any inspections needed have been completed by a competent person, and that the results have been recorded
- Always operate the equipment within the safe operating limits. If these are not provided by the manufacturer or supplier, a competent person can advise you, for example your employers' liability insurer
- Provide instruction and relevant training for the workers who are going to operate the pressure equipment and also include what to do in an emergency
- Ensure you have an effective maintenance plan in place, which is carried out by appropriately trained people
- Make sure that any modifications are planned, recorded and do not lead to danger

Find out more

[More advice on pressure systems](#)

The law

The Pressure Systems Safety Regulations 2000 deal with the safe operation of a pressure system.

The Pressure Equipment Regulations 1999 deal with the design, manufacture and supply of pressure systems.