Pressure Systems

Equipment and systems containing a fluid or gas under pressure (e.g. boilers, steam heating systems, air compressors, autoclaves and pressure cookers) can cause serious property damage and death or injury to people if the contents are released unintentionally.

The principal causes of incidents are poor design, installation and maintenance but also operator error due to poor training and supervision.

The simple steps below can help you to minimise the risks when working with pressure systems and you may find them useful as a safety checklist.

STEP 1 If installing new equipment, ensure that is suitable for its intended purpose, that it is correctly installed, and can be accessed and operated safely.

STEP 2 Ensure that a suitable and accurate (ie up-to-date) schematic drawing is available and that it is clearly marked to identify and locate all parts which should be subject to maintenance and/or examination (for a simple system this may be covered by the instruction manual).

STEP 3 Know what gas/fluid is being contained, stored or processed and the safe operating limits of the system, (pressure, temperature, fluid levels etc) and any equipment directly linked to or affected by it.

STEP 4 Ensure that there is a set of operating instructions for all equipment and for the control of the whole pressure system, including what to do in the case of an emergency. Make these available to the appropriate employees.

STEP 5 Ensure that protective devices such as pressure relief valves have been adjusted to the correct setting, and that they are kept in good working order at all times.

STEP 6 Carry out a programme of suitable maintenance using trained and competent employees. Ensure alternative safety arrangements are made if protective devices have to be isolated during maintenance, eg. lock-out devices, safety notices etc.

STEP 7 In addition draw up a written scheme of examination for all protective devices, pressure vessels and pipework that could give rise to danger if they were to fail. This will be required if the system contains steam or operates at or above a certain pressure (seek expert advice). Such a scheme should state how frequently the equipment should be examined and by whom. Ensure that all reports are actioned.

STEP 8 Provide suitable training to all employees who work at or near pressure systems and closely supervise new staff. The competency of contractors should be strictly verified.

STEP 9 Monitor and record all incidences where a protective device operates or where there is an unexpected reading of a gauge or control instrument. Take prompt remedial action as necessary.

Case Study

Two engineering companies were fined when a pressure test technician was decapitated by an exploding valve. His employers had failed to check that the valve was able to withstand the pressure needed to carry out the test. The exploding valve was estimated to have been travelling at 160mph at the time of the accident.