

Safety of Pressure Systems

a Guidance on Written Schemes of Examination



On 1 October 1997 the Approved Code of Practice (ACoP) for the Safety of Pressure Systems and Transportable Gas Containers was issued. The aim of the ACoP is to give practical guidance to users/ owners of pressure systems and owners of transportable gas containers to meet their responsibilities under the Health and Safety at Work (Jersey) Law, 1989.

Users and owners of pressure systems are required to demonstrate that they know the operating pressures of their pressure systems and that the systems are actually safe at those pressures. They also need to ensure that a suitable written scheme of examination is in place.

This leaflet provides guidance for the drafting of written schemes of examination. It cannot cover all aspects of the ACoP and you can obtain further information by reading the literature listed at the end of the leaflet, or by contacting the Health and Safety Inspectorate of the Employment and Social Security Department.

what is meant by a written scheme of examination?

A written scheme of examination is a document containing information about selected items of plant or equipment which form a pressure system, operate under pressure and contain a 'relevant fluid'. The term 'relevant fluid' is defined in the ACoP and covers compressed or liquefied gas including air above 0.5 bar pressure (7.25 psi), pressurised hot water above 100°C and steam at any pressure.

The typical contents of a written scheme of examination would include:

- identification number of the item of plant or equipment;
- those parts of the item which are to be examined;
- the nature of the examination required, including the inspection and testing to be carried out on any protective devices;
- the preparatory work necessary to enable the item to be examined;
- the date by which the initial examination is to be completed (for newly installed systems);
- the maximum interval between one examination and the next;
- the critical parts of the system which if modified or repaired should be examined by a competent person before the system is used again;
- the name of the competent person certifying the written scheme of examination;
- the date of certification.

what should I do first to draw up a written scheme of examination?

The first step in drawing up a written scheme of examination is to look around your workplace and decide which items of plant or equipment operate under pressure and form a pressure system. Next, you should follow the steps described in the Department of Employment and Social Security's leaflet 'Guidance on Safe Pressure Systems'. You should also check the exceptions to the Approved Code of Practice, since you may find that your particular pressure system does not require a written scheme of examination at all. For example, it is not normally necessary to include air compressors in the scheme of examination. Should you require further advice please refer to your competent person or your engineering insurance and inspection company.

which items of plant should be included in the written scheme of examination?

Items of plant forming the pressure system should be selected for inclusion in a written scheme of examination if a failure of the item could unintentionally release pressure from the system, and the resulting release of stored energy could cause injury. Each system is likely to be unique, but the following questions may help users to arrive at some decisions:

- Do the manufacturers of the plant or equipment forming the pressure system give guidance, instruction and the precautions to be taken for safe operation of the system?
- Do you use or own any pressurised plant or equipment that could fail and cause injury through a sudden release of stored energy (for example, by damage or corrosion)?

- Could failure of any part of the pressure system cause someone in the vicinity to be injured by the release of pressure, fragments or steam?
- Does the pressure system contain any protective devices?

If the answer to any of these questions is 'Yes' then those items of plant may need to be included in the written scheme of examination.

what sort of typical pressurised systems might be included or excluded from the written scheme of examination?

The following pressurised systems are likely to be *included*:

- a compressed air receiver and the associated pipework;
- a steam sterilising autoclave and associated pipework and protective devices;
- a steam boiler and associated pipework and protective devices;
- a pressure cooker;
- a large vapour compression refrigeration or air conditioning system;
- the components of self-contained Breathing Apparatus Sets (excluding the gas container);
- a fixed LPG storage system supplying fuel for heating in a workplace.

The following pressurised systems are likely to be *excluded*:

- an office hot water urn (for making tea);
- a machine tool hydraulic system;
- a pneumatic cylinder in a compressed air system;
- a hand held tool;
- a combustion engine cooling system;
- a portable fire extinguisher with a working pressure below 25 bar (362.5 psi) at 60°C and having a total mass not exceeding 23 kilograms;
- a portable LPG cylinder;
- a tyre used on a vehicle.

The above are typical examples for guidance purposes only. You must decide whether, or not, your pressurised system is covered by the ACoP.

are written schemes of examination necessary for portable gas welding sets?

Written schemes of examination are not required for the regulators, pressure gauges, hoses, torches and other components that form part of conventional gas welding sets (portable, twin cylinder, oxy-acetylene or oxy-propane sets used for welding, cutting and burning).

who decides which items of plant are included in the written scheme of examination?

Users of pressure equipment which is not mobile, or owners of mobile systems (eg. hired pressure plant), have a responsibility to define the items of plant which form a pressure system and within that system the items of plant which need to be included in the written scheme of examination. To arrive at a properly informed decision, users or owners may seek advice from other sources such as in-house engineering staff, inspection bodies or consultants, but the responsibility for defining the scope of the scheme rests with users or owners. The written scheme should generally cover all items within a self-contained pressurised system which may give rise to danger. If you have more than one self-contained pressure system, you will probably need more than one written scheme, ie. one system, one scheme.

what happens when the scope of the written scheme has been defined?

The user or owner of the pressure system should contact a person with sufficient knowledge and expertise about the system, ie. one who is capable of offering informed advice on the subject, and discuss the scope of the written scheme with them, and, if necessary, modify the scope accordingly. The written scheme of examination should then be submitted to a competent person (as defined in the Approved Code of Practice) who may or may not be the same competent person who advised the user or owner on the scope of the written scheme. The competent person will normally advise on the nature and frequency of examination and any special safety measures necessary to prepare the system for examination. If requested by the user, the competent person may draw up and certify as suitable the written scheme of examination, or he/she may simply certify as suitable a written scheme of examination prepared by the user or owner.

does the written scheme of examination need to be reviewed periodically?

The written scheme of examination must be 'suitable' throughout the lifetime of the plant or equipment and it follows that it should be reviewed and, when necessary, revised. For example, as the age of some plant increases, you may need to carry out more frequent examinations or change their content or type. It is the user's responsibility under the ACoP to ensure that the content of the written scheme is reviewed at appropriate intervals by a competent person to determine if it remains suitable, but clearly the competent person should be in a position to give advice on this aspect.

what should I do next?

The users and owners of pressure systems covered by a written scheme of examination have a responsibility to ensure that those systems are examined by a competent person in accordance with the scheme.

the competent person

The Safety of Pressure Systems and Transportable Gas Containers, Approved Code of Practice places a great deal of emphasis on the role of the competent person and provides a clear definition of the competent person. Moreover, the ACoP imposes duties directly on the competent persons themselves.

who can be competent persons under an approved code of practice?

Engineering Insurance and In-Service Inspection Companies will provide competent person services. The ACoP gives some helpful advice about the competent person.

what duties do competent persons have under the approved code of practice?

The duties of the competent persons are to:

(a) *advise the user or owner of a pressure system subject to the ACoP, of the scope of the written scheme of examination.*

An important function of a competent person under the ACoP arises from the need for the user or owner to decide upon the scope of the written scheme, and to review its scope from time to time. For this purpose he will need the advice of a competent person.

(b) *draw up or certify written schemes of examination.*

Deciding upon the intervals between examinations and the types of examination required is a matter requiring considerable expertise. For that reason the ACoP defines three categories of system, major, intermediate and minor, and sets out the attributes necessary for competent persons to operate successfully in each of these areas. It is the responsibility of the user to find a competent person who is suitable for his category of plant.

(c) *carry out examinations and make assessments based on anticipated future usage of the system.*

It is not practicable to allocate such duties to an individual person in the case of all pressure systems. Examinations of complex plant may require, in addition to an engineer surveyor, a qualified metallurgist, an NDT specialist etc.. The ACoP should be construed as requiring the competent person who makes an examination and signs the report on it, to assume responsibility for ancillary work, such as non destructive testing, which is a necessary part of the assessment even when this is carried out by another body.

is it necessary to use the same competent person for (b) and (c)?

To provide flexibility, the user or owner of a pressure system may select a competent person for one duty who is different from the competent person for the other. This enables him to use, for example, the expertise of an organisation with the highest qualifications or greatest experience for the written scheme, while at the same time enabling another organisation to offer him its services for examinations.

However, the user must ensure that whoever carries out the duties has the necessary expertise.

reference

Further information is given in the following publications:

Safety of Pressure Systems and Transportable Gas Containers
Approved Code of Practice ACoP 3.

Health and Safety Inspectorate's leaflet 'Guidance on Safe Pressure Systems'.