

THE ENGINEERING EQUIPMENT AND MATERIALS USERS ASSOCIATION

**SELECTIVE GUIDE TO THE
PRESSURE SYSTEMS
AND TRANSPORTABLE GAS CONTAINERS
REGULATIONS**

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THE ENGINEERING EQUIPMENT AND MATERIALS USERS ASSOCIATION

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CONTENTS

	Page
1. INTRODUCTION	1
2. SCOPE	1
3. REGULATION 2 - INTERPRETATION	1
3.1 Mobile System	1
3.2 Pressure System	2
3.3 Protective Devices	2
4. REGULATION 7 - SAFE OPERATING LIMITS	5
5. REGULATION 8 - WRITTEN SCHEME OF EXAMINATION	5
5.1 General	5
5.2 Application	6
5.3 Nature (or type) of Examination	6
5.4 Frequency of Examination	7
5.5 Pipework	7
5.6 Pipelines	8
6. REGULATION 10 - ACTION IN CASE OF IMMINENT DANGER	8
7. SCHEDULE 3 - LEASED OR HIRED EQUIPMENT	9

ANNEXES

1. MEMBER COMPANIES OF CUI	10
2. METHODS OF EXAMINATION	11
3. EEMUA/CUI INTERPRETATION OF THE REQUIREMENTS FOR PIPEWORK UNDER REG. 8 OF PSRs.	16
4. PIPELINES AND 1962 ACT	17
5. EXAMPLES IN RESPECT OF IMMINENT DANGER	18
6. RELATED SAFETY LEGISLATION	20
8. EEMUA PUBLICATIONS - SUMMARY LIST	21

1. INTRODUCTION

This Guide has been written by the Committee of User Inspectorates (CUI) and published by the Engineering Equipment and Materials Users Association (EEMUA) with which it is closely related. The background to this work is outlined below.

The Pressure Systems and Transportable Gas Containers Regulations 1989 (hereinafter referred to as PSRs) comprise a package of three documents - the Regulations themselves, the Approved Code of Practice (Safety of Pressure Systems) and the Guidance on Regulations - that contain a complex series of requirements. For this reason the CUI - representing most of the major companies with in-house (second party) inspecting organisations (see Annex 1) - considered that a statement of common policy would be of value as a reference document for members where PSRs allow a significant element of experienced, professional judgement by the User and/or Competent Person, or where they demand especially careful interpretation; and it was envisaged that such a statement could form the basis for a selective Guide that would be useful to a wider section of industry.

In parallel with the above the CUI revised the Institute of Petroleum Model Codes of Safe Practice (Part 12 Pressure Vessel Examination and Part 13 Piping System Examination) and the Guide makes reference to these for detailed recommendations on the management of Schemes of Examination for in-service equipment.

Throughout this Guide the terms contained within single quotation marks when first used are meant to be interpreted as defined in Regulation 2. of PSRs.

2. SCOPE

This Document gives guidance on the interpretation of Regulations relating to the periodic examination of pressure systems and certain associated aspects, and considers in particular Regulations 2,7,8 & 10; it does not refer in detail to the other Regulations because the CUI could see no point in reiterating what already is clearly expounded in the PSR package published by the HSE. This Guide, therefore, should not be read in isolation, but should be used to augment the existing HSE documents where appropriate.

Transportable Gas Containers are not within the Scope.

3. REGULATION 2 - INTERPRETATION

3.1 Mobile System

Under this definition, it should be noted that sample bottles containing a Relevant Fluid that do not meet the conditions specified for Transportable Gas Containers as defined in Regulation 16 shall be considered as potential 'mobile systems' as defined in Regulation 2 when the pressure x volume is greater than 250 bar litres.

In addition to the marking required by PSRs the regulations covering the classification conveyance and labelling of dangerous substances may need to be considered when such bottles are transported offsite. These are listed over.

- The Classification, Packaging and Labelling of Dangerous Substances Regulations 1984;
- The Road Traffic Carriage of Dangerous Substances in Packages Regulations 1992:

3.2 Pressure System

The Regulations are founded on the concept of 'Pressure Systems' - not solely Pressure Vessels.

A Pressure System is defined in Regulation 2 as -

- a) a system comprising of one or more pressure vessels of rigid construction, any associated 'pipework', and 'protective devices';
- b) the pipework with its protective devices to which a transportable gas container is, or is intended to be connected; or
- c) a 'pipeline' and its protective devices;

which contains or is liable to contain a 'relevant fluid', but does not include a Transportable Gas Container.

It is thus apparent that the equipment necessary to comprise a Pressure System under the Regulations is bounded by lower limits but there are no maxima. A Pressure System may therefore encompass the whole of a process plant or small portions thereof, providing the latter include the minimum elements noted in (a), (b) or (c) above. Precisely how a complex refinery or chemical works is segregated into Pressure Systems in terms of Regulation 2 is a matter of individual preference and convenience; but it is recommended that the number of such systems be minimised to avoid unnecessary complication of administration and records. In many cases, therefore, substantial parts of the whole process plant will be designated as a Pressure System.

3.3 Protective Devices

The Regulations define Protective Devices as those designed to protect the Pressure System against system failure and devices designed to give warning that system failure might occur. Bursting discs are included.

The HSE document Guidance on the Regulations (page 10) explains clearly that the definition of Protective Device does not include every device which has a control or measuring function. Rather it includes any protective control or measuring equipment which is essential to prevent a dangerous situation from arising. Instrument and control equipment should be considered as a protective device subject to the Regulation where it has to function correctly in order to prevent the safe operating limits being exceeded where no other protective device is provided.

The Table offers examples of devices which may be considered as essential to prevent system failure and which therefore should be included in Schemes of

Examination. It must be stressed that the examples given in the Table for the purpose of illustration and should not be regarded as definitive.

There are other devices that are used to prevent physical damage to equipment. These are not necessary to prevent a sudden discharge of pressure energy that may cause danger to persons because either there is a backup device to prevent overpressure or the subject components are non-pressure containing - such devices therefore do not come within the scope of the Regulations.

The decision to apply the Regulation to a device is dependent upon whether or not the correct operation of that device is essential for the pressure integrity of the system. In general normal operating parameter monitoring devices such as pressure gauges and temperature indicators would not be included in Scheme of Examination.

EXAMPLES OF PROTECTIVE DEVICES TO BE CONSIDERED FOR INCLUSION IN A SCHEME OF EXAMINATION

Description of Function	Typical Examples	Possible consequence of Device Failing to operate
Devices to relieve excess pressure	Relief Valves Bursting Discs	Failure due to over-pressurisation
Devices to prevent a predetermined temperature level from being exceeded	a) High temp trips b) Low temp trips	a) Failure due to loss of strength as a result of exposure b) Loss of Ductility at low temperature
Warning devices	a) Fusible Plugs b) Pressure gauge or alarm that indicates when space between bursting disc and safety valves assembly is pressurised	a) Failure due to loss of strength as a result of exposure to high temperature b) Pin-holing of disc would not be identified and over-pressurisation could result
Rapid isolation of excessive pressure source	Slam shut valves	Failure due to over-pressurisation
Restriction device to limit the flow rate from a high pressure source	a) Restriction Orifice Plate b) Control valve Trim	Failure due to over-pressurisation
Device to indicate low level of water in boiler	Level gauge	Failure due to over-heating of boiler.