



## Guide to the Safety, Health and Welfare at Work

(General Application)(Amendment)  
Regulations 2012 (S.I. No. 445 of 2012)

# Pressure Systems

Our vision:

A country where worker safety, health and welfare and the safe management of chemicals are central to successful enterprise

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## Introduction

The Safety, Health and Welfare at Work (General Application) (Amendment) Regulations 2012 (S.I. No. 445 of 2012) amend the Safety, Health and Welfare at Work (General Application) Regulations 2007 (S.I. No. 299 of 2007) by adding a Part 10 and associated Schedule 12 to deal with pressure systems.

The failure of pressure equipment can result in fatalities and serious injuries and cause major damage to property. The purpose of the Regulations is to provide a robust regime for the management of pressure systems, including clear requirements for periodic statutory examinations of pressure vessels.

**This guide is not intended as a legal interpretation of the legislation.** Neither is it a detailed technical document that covers all the implications of any given Regulation.

The Safety, Health and Welfare at Work (General Application) (Amendment) Regulations 2012, came into operation on 1st January 2013. The repeal of the Boiler Explosions Acts from 1882 and 1890 and provisions of the Safety in Industry Acts 1955 and 1980 relating to steam boilers and steam and air receivers was also activated by the Safety, Health and Welfare at Work Act 2005 (Commencement) Order 2012 (S.I. No. 446 of 2012) on 1st January 2013.

In this guide the text of the Regulations is shown in italics.

The General Application (Amendment) Regulations 2012 are made under the Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005) which is referred to in this guide as the “2005 Act”.

These Regulations apply, subject to the exceptions listed in Part A of Schedule 12, to pressure systems and pressure equipment in any work location. The objective is to control the hazards presented by pressure systems by way of design, installation, maintenance and periodic vessel examination.

The definitions of “pressure equipment” and “pressure systems” in Regulation 183 cover a wide variety of equipment in use at workplaces.



# Introduction

Examples of pressure systems include:

- steam boilers and steam heating systems;
- pressurised process plant and piping;
- compressed air systems (fixed and portable);
- refrigeration systems.

Examples of pressure equipment include:

- pressure cookers, autoclaves and retorts;
- heat exchangers;
- valves, steam traps and filters;
- piping and hoses;
- pressure gauges and level indicators.

These Regulations apply to pressure equipment in use; they do not cover the duties of those placing pressure equipment on the EU market for the first time; these are addressed in the European Communities (Simple Pressure Vessels) Regulations 1996 (S.I. No. 33 of 1996) which implements Directive 87/404/EEC and the European Communities (Pressure Equipment) Regulations 1999 (S.I. No. 400 of 1999) which implements Directive 97/23/EC and the European Communities (Carriage of Dangerous Goods by Road and Use of Transportable Pressure

Equipment) Regulations, 2011 (S.I. No. 349 of 2011) which implements Directive 2010/35/EU.

It is important to note that these Regulations are intended to ensure the mechanical integrity required by the pressurised state of the equipment. The Regulations are not intended to deal with other hazards that may arise from the operation of a pressure system such as the consequences of a pressure release involving toxic or flammable contents. Such hazards are dealt with under provisions of other legislation such as the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001 (S.I. No. 619 of 2001) and the European Communities (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2006 (S.I. No. 74 of 2006).



## Regulation 183: Interpretation for Part 10

183. (1) In this Part–

**“danger”** in relation to a pressure system means reasonably foreseeable danger to persons from system failure;

**“examination”** means a careful and critical scrutiny of a pressure system or part of a pressure system, in or out of service as appropriate, using suitable techniques, including testing where appropriate, to assess–

(a) its actual condition, and

(b) whether, for the period up to the next examination, it is safe to operate when properly used if normal maintenance is carried out;

**“fluid”** means gases, liquids and vapours in pure phase as well as mixtures thereof and fluid may contain a suspension of solids;

**“maximum allowable pressure”** or **“minimum allowable pressure”** means the maximum pressure and minimum pressure, as the case may be, for which the equipment, or part thereof, is designed, as specified by the manufacturer;

**“maximum allowable temperature”** or **“minimum allowable temperature”** means the maximum or minimum temperature, as the case may be, for which the equipment is designed, as specified by the manufacturer;

**“pipeline”** means a pipe or system of pipes used for the conveyance of relevant fluid across the boundaries of premises, together with any apparatus for inducing or facilitating the flow of relevant fluid through, or through a part of, the pipe or system, and any valves, valve chambers, pumps, compressors and similar works which are annexed to, or incorporated in the course of, the pipe or system;



**“piping”** means piping components intended for the transport of fluids, when connected together for integration into a pressure system and includes in particular a pipe or system of pipes, tubing, fittings, expansion joints, hoses, bellows or other pressure-bearing components as appropriate, and heat exchangers consisting of pipes for the purpose of cooling or heating air shall be considered as piping;



## Regulation 183: Interpretation for Part 10

**“pressure”** means pressure relative to atmospheric pressure, i.e. gauge pressure, and, as a consequence, vacuum is designated by a negative value;

**“pressure accessories”** means devices with an operational function and having pressure-bearing housings;

**“pressure equipment”** means vessels, piping, protective devices and pressure accessories used with a relevant fluid and where applicable, pressure equipment includes attachments relevant to the integrity of the equipment;

**“pressure system”** means a system comprising one or more pressure vessels of rigid construction, any associated piping and protective devices and pressure accessories which contains or is liable to contain a relevant fluid;

**“protective devices”** means devices designed to protect the pressure equipment against the safe operating limits being exceeded, including:

- (a) devices for direct pressure limitation, such as safety valves, bursting disc safety devices, buckling rods, controlled safety pressure relief systems,
- (b) limiting devices, which either activate the means for correction or provide for shutdown or shutdown and lockout, such as pressure switches, temperature switches or fluid level switches and safety related measurement control and regulation devices, and
- (c) devices designed to give warning that the safe operating limits are being exceeded;

**“relevant fluid”** means–

- (a) steam,
- (b) any gas which is at a pressure greater than 0.5 bar above atmospheric pressure (1013 mbar),
- (c) a liquid which would have a vapour pressure greater than 0.5 bar above atmospheric pressure (1013 mbar) when in equilibrium with its vapour at either the actual temperature of the liquid or 17.5 degrees Celsius;



## Regulation 183: Interpretation for Part 10

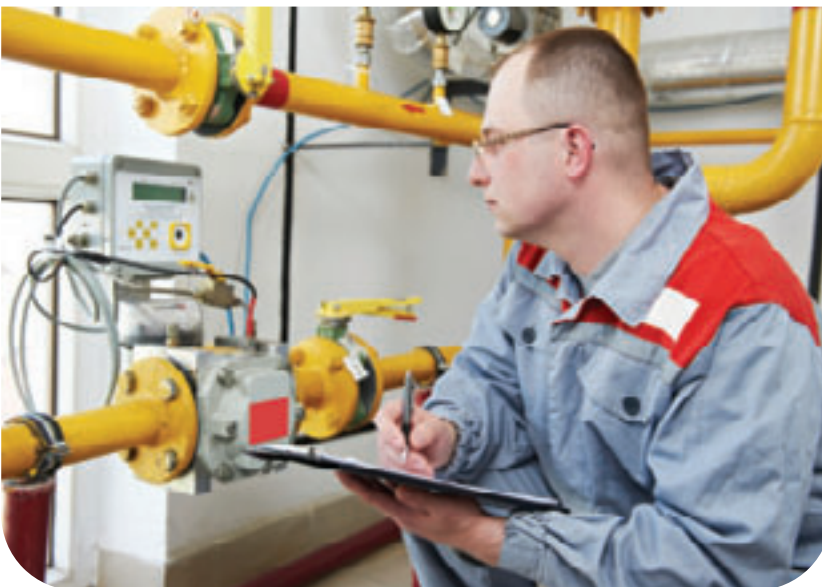
**“safe operating limits”** means the operating limits (incorporating a suitable margin of safety) beyond which system failure is liable to occur;

**“system failure”** means the unintentional release of stored energy from a pressure system;

**“user”** in relation to a pressure system, means the employer or self-employed person who has control of the operation of the pressure system and includes, in the case of a lease of the pressure system, the lessee;

**“vessel”** means a housing designed and built to contain relevant fluids including its direct attachments up to the coupling point connecting it to other equipment, and a vessel may be composed of more than one chamber.

Some of the implications of the definitions will be explored in the sections of this guide dealing with particular Regulations. The definition of “relevant fluid” is particularly important for understanding the scope of these Regulations in that there is no pressure criterion associated with steam i.e. steam may be at any pressure. It is also important to understand that the Regulations apply to other pressure systems or equipment at pressures greater than 0.5 bar subject to the exceptions listed in Part A of Schedule 12. Hot water e.g. in pressurised hot water systems, is considered as a relevant fluid at a temperature of 112°C and above.





## Regulation 184: Application of Part 10

*184. This Part applies to the use, examination and testing of pressure equipment or pressure systems (other than pressure systems referred to in Part A of Schedule 12) which are used or intended to be used at work.*

The requirements of these Regulations apply to the use, examination and testing of pressure equipment and pressure systems at all places of work to which the Safety, Health and Welfare at Work Act 2005 applies, unless excepted by Part A of Schedule 12. This schedule lists a variety of pressure systems and equipment which may be used in a work environment but are exempt from the requirements of these Regulations. The exception may be for reasons of practicality, lack of incident history or because the equipment may already be covered by other specific legislative provisions.

Equipment listed in Part A of Schedule 12 and excepted from these regulations may still be work equipment to which Regulation 30 of the General Application Regulations 2007 applies and, in that case, the employer must have an appropriate scheme of inspections in place.

Regulation 30 states that:

*An employer shall ensure that—*

*(a) where the safety of work equipment depends on the installation conditions—*

*(i) an initial inspection is carried out after installation is completed and before it is first put into service, and*

*(ii) an inspection is carried out after assembly at any new site or in any new location, and that the work equipment is installed correctly and is operating properly,*

*(b) in the case of work equipment which is exposed to conditions causing deterioration liable to result in a danger to safety or health—*

*(i) periodic inspections and, where appropriate, testing is carried out,*

*(ii) special inspections are carried out when exceptional circumstances arise which are liable to make the work equipment unsafe, including modification work, accidents, natural phenomena or prolonged inactivity, and*

*(iii) deterioration is detected and remedied in good time,*

*(c) inspections carried out under paragraphs (a) and (b) are carried out by a competent person and are appropriate to the nature, location and use of the work equipment,*

*(d) the results of inspections carried out under paragraphs (a) and (b) are recorded and kept available for 5 years from the date of inspection, for inspection by an inspector, and access to these records is made available to users of the work equipment upon request, and*

*(e) when work equipment is used in another place of work, it is accompanied by evidence of the last inspection carried out under paragraphs (a) and (b).*

## Regulation 185: Revocations, saver and transitional matters

185. (1) *The following are revoked:*

- (a) *Factories (Preparation of Steam Boiler for Examination) Regulations 1956 (S.I. No. 174 of 1956),*
- (b) *Factories (Report of Examination of Steam Boiler) Regulations 1956 (S.I. No. 183 of 1956),*
- (c) *Factories (Report of Examination of Steam Receivers) Regulations 1956 (S.I. No. 184 of 1956),*
- (d) *Factories (Report of Examination of Air Receivers) Regulations 1956 (S.I. No. 185 of 1956),*
- (e) *Factories (Report of Examination of Air Receivers) (Amendment) Regulations 1978 (S.I. No. 357 of 1978),*
- (f) *Factories (Report of Examination of Steam Receivers) (Amendment) Regulations 1978 (S.I. No. 358 of 1978), and*
- (g) *Factories (Report of Examination of Steam Boiler) (Amendment) Regulations 1978 (S.I. No. 359 of 1978).*

The Regulations listed above are revoked by these Regulations. In addition the repeal of

- (a) the Boiler Explosions Act 1882 and the Boiler Explosions Act 1890, and

- (b) Sections 40, 41, 42 and 43 of the Factories Act 1955 (No. 10 of 1955) as amended by sections 31, 32 and 33 of the Safety in Industry Act 1980 (No. 9 of 1980)

is activated by the coming into operation of the Safety, Health and Welfare at Work Act 2005 (Commencement) Order 2012.

(2) *Where an examination has been carried out, or commenced, under and in compliance with an applicable statutory provision prior to the coming into operation of this Part, the examination shall be regarded as being in compliance with this Part and Regulation 191 (other than paragraph (1) thereof) shall not apply until after the expiry of the period relating to that examination, as appropriate, specified under the applicable statutory provision.*



## Regulation 185: Revocations, saver and transitional matters

*(3) An employer who is a user or owner of a pressure vessel shall ensure that an examination is carried out under this Part not later than 3 months after the coming into operation of this Part where such an examination was required and was due to be carried out under an applicable statutory provision but was not carried out before the coming into operation of this Part.*

These requirements deal with issues that arise from the transition to the new Regulations. Regulation 185(2) recognises examination work carried out under legislation in force up to 31st December 2012 e.g. if a steam boiler received a thorough examination in June 2012, the latest

date for the next examination (which will be the first examination under these Regulations) will be fourteen months later.

The introduction of these regulations cannot be used as an excuse to delay examinations that were due under previous legislation as Regulation 185(3) sets a deadline for the completion of overdue examinations.



## Regulation 186: Design, construction and safe operating limits of a pressure system or parts thereof

*186. An employer shall ensure that in respect of a pressure system or parts thereof –*

*(a) without prejudice to the generality of Regulation 28:*

- (i) it is of good construction, sound material, adequate strength, suitable quality and free from patent defect;*
- (ii) it is properly installed and used;*
- (iii) it is properly maintained;*
- (iv) the safe operating limits of pressure equipment or the pressure system have been established, and adequate information on said limits is available;*
- (v) each vessel is marked with the information specified in Part C of Schedule 12, where known;*
- (vi) each vessel is uniquely marked in a plainly visible and durable form to enable it to be readily identifiable;*
- (vii) in the case of a steam boiler, the safe operating limit shall be clearly displayed.*

Regulation 28 of the General Application Regulations 2007 sets out a range of duties in respect of the use of work equipment which need to be taken into account in conjunction with these Regulations.

In order to comply with Regulation 186, it is important that the equipment is installed by a competent person and that an appropriate

preventive maintenance regime is put in place. Employers must satisfy themselves that pressure equipment is suitable for its intended purpose and is installed correctly. This requirement can normally be met by checking that appropriate design, construction and installation standards and codes of practice are complied with. The supplier of the equipment should be able to demonstrate that it complies with the relevant European Directives and standards.

The pressure system should be manufactured from materials suitable for the substances it will contain. Employers should know, by checking with designers, manufacturers or installers, the safe operating limits of the system and of any equipment directly linked to it or affected by it. The expected pressures and temperatures of some pressure systems are readily determined but where there is the risk of runaway chemical reactions, specialist laboratory testing may be required to determine the safe operating limits and sizing of pressure relief systems.

The adequate design, installation and maintenance of pressure systems includes measures to protect against vacuum in situations where vacuum can occur.

It is good practice to have a preventive maintenance programme and maintenance file for the system as a whole and for some systems where there is the potential for serious injury or damage, they are a necessity. Such a programme needs to take account of any statutory examination requirements of these Regulations. It should take into account the system and equipment age, its uses and the environment in which it operates. It should include monitoring procedures to look for tell-tale signs of problems with the system, e.g. a



## Regulation 186: Design, construction and safe operating limits of a pressure system or parts thereof

safety valve repeatedly discharging, maximum operating temperatures or pressures being exceeded or evidence of wear and corrosion. See also Regulation 190.

It is important that pressure vessels are properly marked in order to ensure safe maintenance and that reports of examination can be linked to the correct vessel. If not already done at the time of manufacture, the safe operating limits should be marked on pressure vessels along with a unique identification mark. This will normally be achieved by affixing a plate or label. Basic information about pressure vessels should be permanently marked on the vessel except in cases where the vessel is so small as to make this impractical. Markings should

not be hard stamped onto the shell of pressure vessels. The minimum information required is listed in Part C of Schedule 12.

In addition, markings should not be obscured, painted over, rendered illegible or located in a place where they are difficult to read.

*(b) it is not operated or allowed to be operated beyond its safe operating limits except for testing purposes as specified by, and under the direction of, a competent person,*

*(c) it is provided with adequate and appropriate protective devices, and any such device designed to release contents shall do so safely.*



## Regulation 186: Design, construction and safe operating limits of a pressure system or parts thereof

No part of a pressure system should be allowed to operate beyond the safe operating limits referred to above. This is achieved by a properly calibrated control system, appropriate instrumentation and a correctly set pressure relief system which will activate in the event that the control system fails.

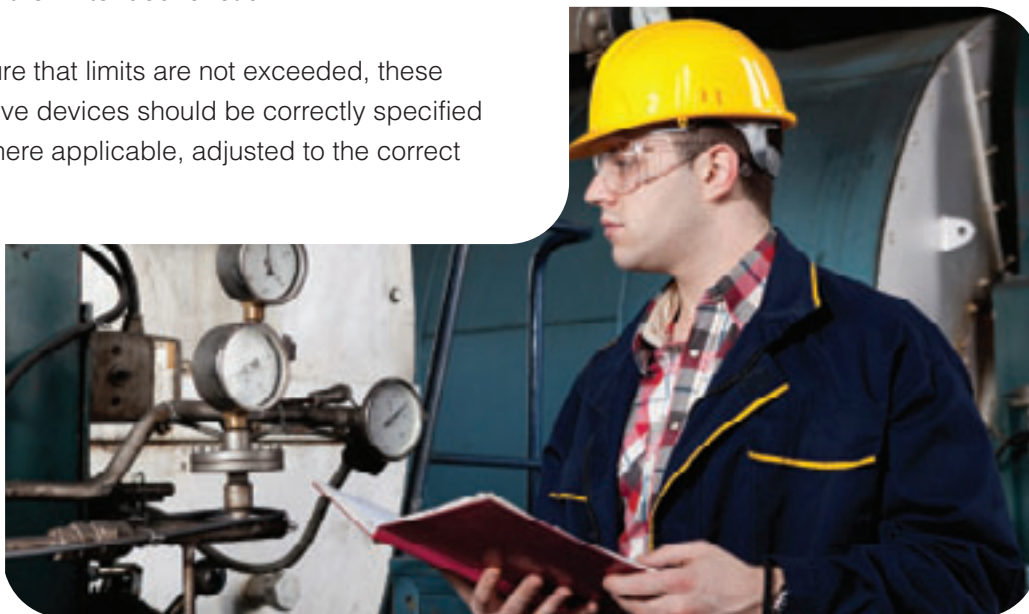
The only reason a system should be operated above the safe operating limits is for the purposes of testing under specialist supervision.

Suitable protective devices should be fitted to the equipment and should be kept in good working order at all times. These devices should be included on a preventive maintenance programme to ensure that they are capable, if required, of fulfilling their intended function.

To ensure that limits are not exceeded, these protective devices should be correctly specified and, where applicable, adjusted to the correct

settings. Once set, these limits should not be altered except where authorised by a competent person. If warning devices e.g. high pressure alarms, are fitted, their activation should be noticeable either by sight or sound and they should be installed in such a manner as their operation is readily detected.

Protective devices such as safety valves and bursting discs should be located such that, if activated, they discharge to a safe place. In some cases this may require the installation of a collection vessel.





## Regulation 187: Installation of pressure equipment or a pressure system

*187. A person who installs pressure equipment or a pressure system at a place of work shall ensure that it is installed so that it may be used safely, without risk to health or impairing the operation of any protective device or inspection facility.*

Persons who install pressure equipment should take care to ensure that the equipment is installed correctly. They should ensure that the manner of installation, e.g. welding procedures, handling practices etc., does not impair the designed integrity of the system. For example, hot work such as welding or cutting may affect the integrity of the system and should not be carried out unless the effect of the work on the integrity of the system is assessed. Examples of other issues that should be given consideration include:

- Access to controls;
- Visibility of gauges;
- Positioning of valves so that pressure relief devices are not at risk of being isolated from the systems being protected;
- Pipework design so the back pressure in discharge lines from pressure relief valves or bursting discs is not excessive.

The installer must ensure that nothing about the way a pressure system is installed shall give rise to danger or otherwise impair the operation of any protective device or inspection facility for that system. This requires that adequate means of access as well as sufficient working space is provided to ensure that inspection facilities are usable.

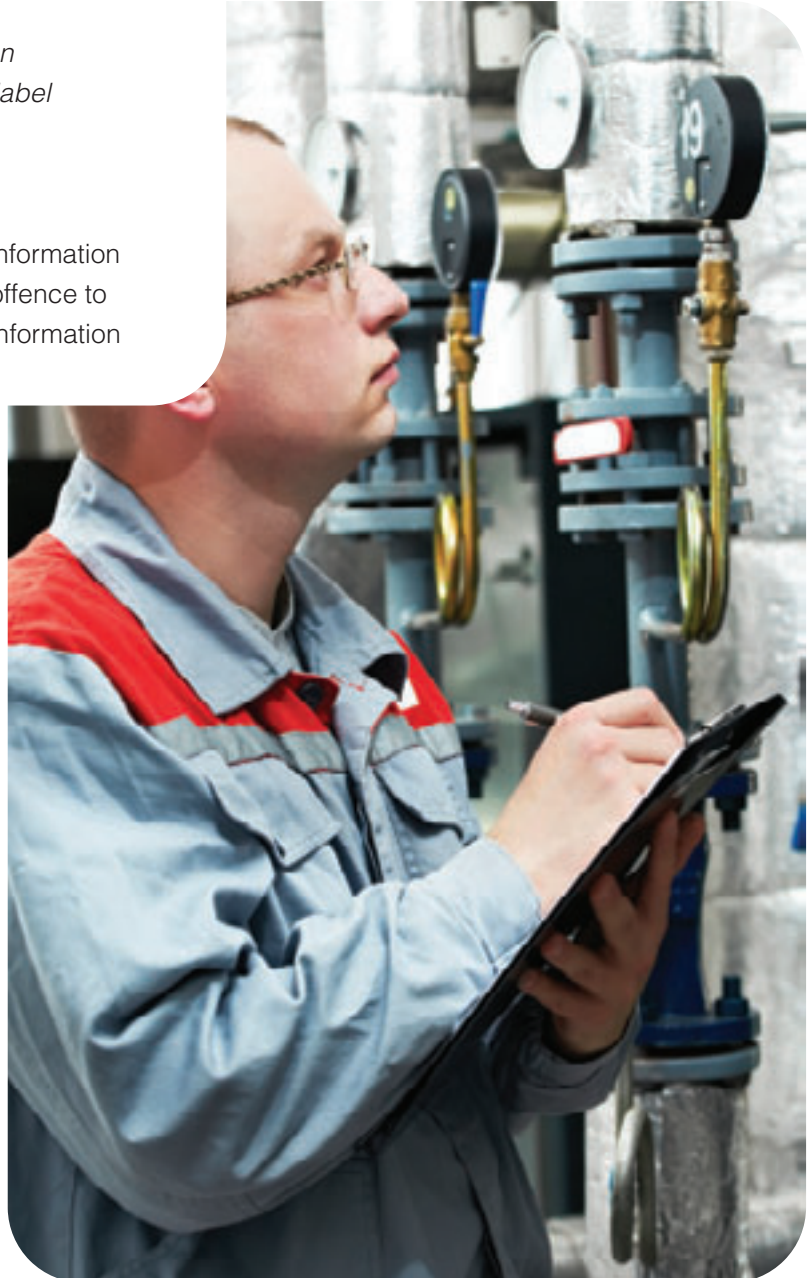


## Regulation 188: Marking

*188. (1) No person shall remove from pressure equipment any mark, plate or label containing any of the information required under Regulation 186 (a)(v).*

*(2) No person shall falsify any mark on pressure equipment or on a plate or label attached to it, relating to its design, construction, test or operation.*

Markings on vessels contain important information and this Regulation makes it a criminal offence to remove those markings or to falsify the information on them.



## Regulation 189: Information and instruction

*189. (1) Without prejudice to the generality of Regulation 29, an employer shall ensure that in respect of pressure equipment or a pressure system –*

*(a) the necessary measures are taken so that employees have at their disposal adequate information and, where appropriate, written instructions concerning–*

*(i) conditions of use,*

*(ii) safe operation,*

*(iii) foreseeable abnormal situations,*

*(iv) action to be taken in the event of an emergency, and*

*(v) conclusions to be drawn from experience in using such equipment, where appropriate, and*

*(b) employees are made aware, whether or not they use the equipment, of safety and health risks relevant to them associated with pressure systems located at or near their workstation.*

*(2) An employer shall ensure that pressure equipment or a pressure system is not operated except in accordance with information or instructions provided under paragraph (1) (a) and (b).*

These requirements build on the general duty in section 8(2)(g) of the 2005 Act and duties under Regulation 29 of the General Application Regulations 2007 to provide employees with information and instruction relating to health and safety.

The application of Regulation 189 will depend on the individual circumstances of equipment use. For example in the case of a heating system, there will be little if any involvement for most employees whereas operation of an autoclave involves a close interaction with its user.

Employees should, where necessary for the conduct of their work, have access to any manuals or instructions produced by the manufacturer and, where issued, updates should be incorporated into the available documentation. Translation of documents may be necessary to ensure that equipment users are adequately informed.

The content of any information or instruction should address, as necessary, normal conditions of use and action to identify and control foreseeable abnormal or emergency situations. These situations may arise, for example, due to an abnormal change in temperature or pressure or a component or service failure. The content should also reflect any lessons learnt from experience, previous incidents or near misses. Information may also be available from other users or inspection bodies or from publications produced by various professional or industry bodies.

## Regulation 189: Information and instruction

The nature of pressure equipment is such that employees may be at risk from equipment that they themselves do not use but which is located in their vicinity, and is capable of exploding or releasing hazardous substances. It is important that those employees are made aware of the hazards and any associated alarm or warning systems. Furthermore, changes in the workplace which affect the safe use of pressure equipment and systems must be both communicated to employees and addressed in revised risk assessments.

*(3) An employer of a person, or a self-employed person, who modifies or repairs pressure equipment or a pressure system shall provide sufficient written information concerning the modification or repair to the user of the system, as may reasonably be needed, to enable the provisions of this Part to be complied with and such information shall be provided to that user as soon as is practicable after the modification or repair and before the pressure system is put back into operation.*

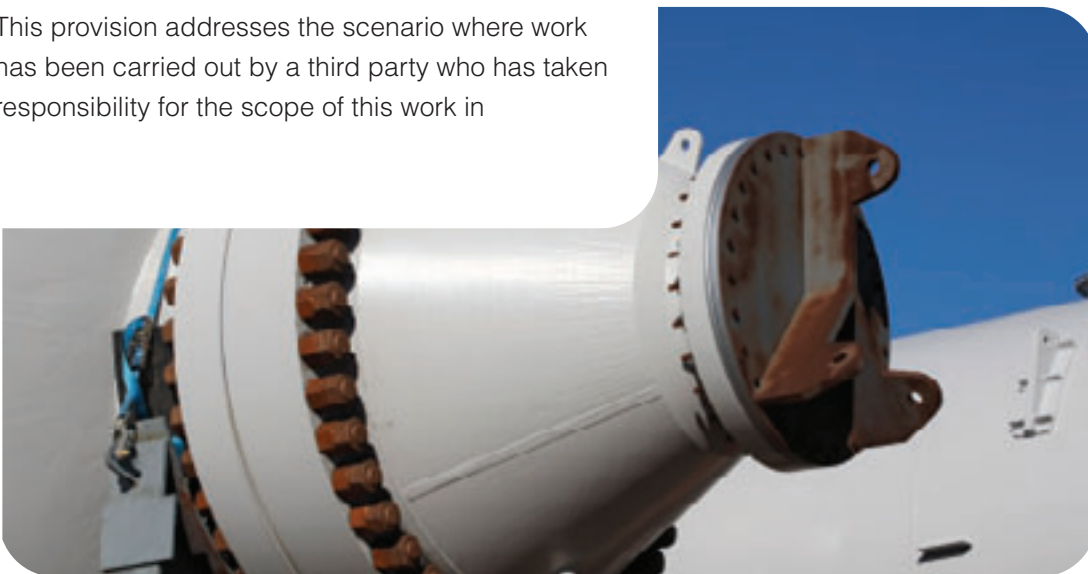
This provision addresses the scenario where work has been carried out by a third party who has taken responsibility for the scope of this work in

circumstances where the system user has not been involved in the management of this work and therefore would not be alert to possible implications.

Prior to any modifications being carried out, a proper assessment should be conducted to ensure that all the implications of the change have been considered. Following modification or repair of any part of a system, the person carrying out such work must, immediately after completion of the work, supply to the user written information concerning the work carried out and the implications for the safe operation of the system including any new instructions, if appropriate.

On receipt of this information the employer may need to revise the operating instructions for the system and alert employees to the changes.

When pressure systems are under repair, precautions need to be in place to prevent the system being accidentally restarted before all the safety devices or systems have been restored.





## Regulation 190: Maintenance of pressure systems

*190. An employer who is a user or owner of a pressure system shall ensure that–*

*(a) so far as is reasonably practicable, in regard to maintenance operations where there is a hazard from pressure, that they are carried out when the pressure system is depressurised and, where this is not practicable, appropriate protection measures are taken for the carrying out of such operations,*

*(b) where appropriate, a maintenance file for any pressure system is maintained and kept up to date, and*

*(c) where the need for repairs which are significant in relation to the system being able to safely withstand pressure becomes apparent, a competent person is consulted on the particulars of those repairs.*

In the ideal world, systems should be depressurised before maintenance work is carried out, but for various reasons this is not always achievable. However, it may be possible to safely isolate the part of the system which requires attention. In certain circumstances work on a live system may be necessary. Protection measures for work on pressure systems will need to address “permit to work” arrangements, isolation procedures and method statements.

It is appropriate to keep a maintenance file for a system or part thereof if its failure can result in a high risk of injury to persons.

While maintenance and the examinations required under Regulation 191 are closely related, the two procedures must be clearly differentiated. A maintenance file or service report is not the same as a report of examination by a competent person produced under Regulation 191(3).

When a defect which may be significant to the pressure integrity of a system, e.g. a crack, becomes apparent or some kind of physical damage has occurred, a competent person must be consulted in order to ensure suitable repairs are carried out. The system shall then be examined by the competent person after such repairs are completed in accordance with Regulation 191 (3)(b).



## Regulation 191: Examination of pressure equipment or a pressure system

*191. (1) Without prejudice to Regulation 30 an employer shall ensure when pressure equipment or a pressure system is installed for the first time at a location that –*

*(a) in the case of new fixed pressure equipment or a pressure system –*

*(i) it is inspected by a competent person and, where appropriate, safety devices are tested, prior to first commission, and*

*(ii) in the case of pressure vessels, a certificate of commissioning and, where appropriate, test, by the competent person specifying the safe operating limits has been obtained,*

*(b) in the case of previously used fixed pressure equipment or a pressure system being installed at a new location, it is inspected and any vessel is examined in accordance with paragraph (3).*

The purpose of this Regulation is to make certain that when pressure equipment or a pressure system is being put into use, it is assessed to ensure its safe operation. Regulation 30 deals with the inspection of work equipment. A distinction is made between “inspection” and “examination” and, in the context of these Regulations, “examination” should be understood as a more thorough process.

Regulations 191(1)(a) and (b) cover the inspection and commissioning of pressure equipment or a pressure system after installation at a location. A commissioning certificate is required for any new pressure vessel.

The equipment should be inspected by a competent person before being put into use. This initial inspection should be carried out at the time of installation of the equipment to ensure that the equipment is installed correctly and is suitable for its intended purpose and that protective devices have been adjusted to the correct settings. Even if equipment or a system has simply been reassembled, it is required that it is inspected and, if need be, safety devices tested to ensure that it is in full working order.

*(c) in the case of a portable or transportable vessel, it has been examined in accordance with paragraph (3), unless it can be shown that the equipment has been in service from new for a period shorter than that to the first periodic examination as determined under paragraph (3).*

Regulation 191(1)(c) is similar in its requirements to Regulation 191(1)(a) and (b) except that it applies to portable pressure vessels which can easily be moved from location to location. It requires that portable vessels must also be examined in accordance with Regulation 191(3) unless they are so new that the period to the first examination has not yet run out.



## Regulation 191: Examination of pressure equipment or a pressure system

*(2) The period (other than where the period is determined in accordance with paragraph (2) or (3) of Regulation 185) within which the first of the examinations referred to in paragraph (3) shall be carried out in respect of a pressure vessel referred to in paragraph (3) shall be determined by reference to the date it was first taken into use, which shall be recorded in the register referred to in Regulation 193(2).*

This provision establishes the date for the first statutory examination of a pressure vessel. When such equipment has been commissioned and is taken into use at a place of work, its details, including date of first use, are to be recorded in the register as referred to in Regulation 193(2). This date of first use is then the reference date from which the date of the next statutory examination is determined.

*(3) Without prejudice to the generality of Regulation 30, an employer shall ensure that a pressure vessel of a type or class specified in column 1 of Part B of Schedule 12, and any associated protective devices and pressure accessories, are not used unless they have been examined by a competent person –*

*(a) at least once during the period specified in column 2 of Part B of that Schedule, unless that period has been amended under Regulation 192(4) or a different period has been specified in writing by the manufacturer,*

*(b) after modification or repair and before return to service where any modification or repair is carried out to a*

*pressure vessel, and the modifications or repairs are significant in relation to the vessel being able to safely withstand pressure, or*

*(c) at any time at the request of an inspector of the Authority.*

Regulation 191(3), through reference to Part B of Schedule 12, sets down the framework for the periodic statutory examination and testing of pressure vessels. Part B presents two categories of pressure vessels requiring regular examination by a competent person and sets out the intervals between examinations for each category. The competent person can determine the type of examination, subject to completing a report of examination that meets the minimum requirements of Part D. The examination periods are fourteen months for vessels in Category 1 and twenty-six months for vessels in Category 2. There is a further provision in Regulation 192(4) which allows the competent person to determine a period outside of those set down in Part B of Schedule 12, in which case the competent person must justify their opinion for setting this different period.

Examination before return to use is required if any modification or repair to a vessel has been carried out which could have major implications for its safe operation. The manufacturer's guidance should be sought and followed where available. Useful information may also be available from competent persons experienced in the examination and inspection of pressure equipment and systems.

The facility for an inspector of the Health and Safety Authority to require an examination is included to

## Regulation 191: Examination of pressure equipment or a pressure system

cover situations such as where there is reason to believe that the examinations or the reports of such examinations are not adequate or there is lack of adequate documentation or new knowledge has come to light that suggests examination is appropriate.

*(4) The examination referred to in paragraph (3) –*

*(a) may be completed in a number of phases and the examination is not complete until all phases are completed,*

*(b) shall, in the case of equipment which is heated, consist of an examination of the equipment when it is cold and an examination of the equipment when under normal pressure; the examination under pressure shall be made on the first occasion when normal pressure is raised after the examination when cold, within 28 days of the completion of the first part of the examination or within a reasonable period specified by the competent person, and*

*(c) may include a test.*

The type of examination required will be specific to the particular equipment being examined and, in some cases, may consist of a series of

examinations. For example, for heated pressure systems such as steam boilers, the process will consist of an examination of the system when it is cold and stripped down and another when it is running under normal conditions. Separate reports will be issued for the cold and the hot examination. In this case the obligation to have the vessel periodically examined is not met until both examinations are completed.

The second examination is required on the first occasion that normal pressure is raised so as to ensure that the reassembly of the vessel has not resulted in a potentially hazardous situation. The reference to “first occasion that normal pressure is raised” does not include the normal commissioning procedures to bring a boiler to its operating mode.

The second examination should take place within twenty-eight days of the first or, if this is not possible, the competent person should specify a reasonable period in which the test should be completed. Such situations can arise where plant is on standby or used on a seasonal or occasional basis and there is no demand to bring the plant online immediately after the cold examination.

The examination may also require all or parts of the equipment to be tested. It is the responsibility of the competent person to determine the examination criteria for the particular equipment.

Where the safe operation of a pressure vessel depends on protective devices which are not

## Regulation 191: Examination of pressure equipment or a pressure system

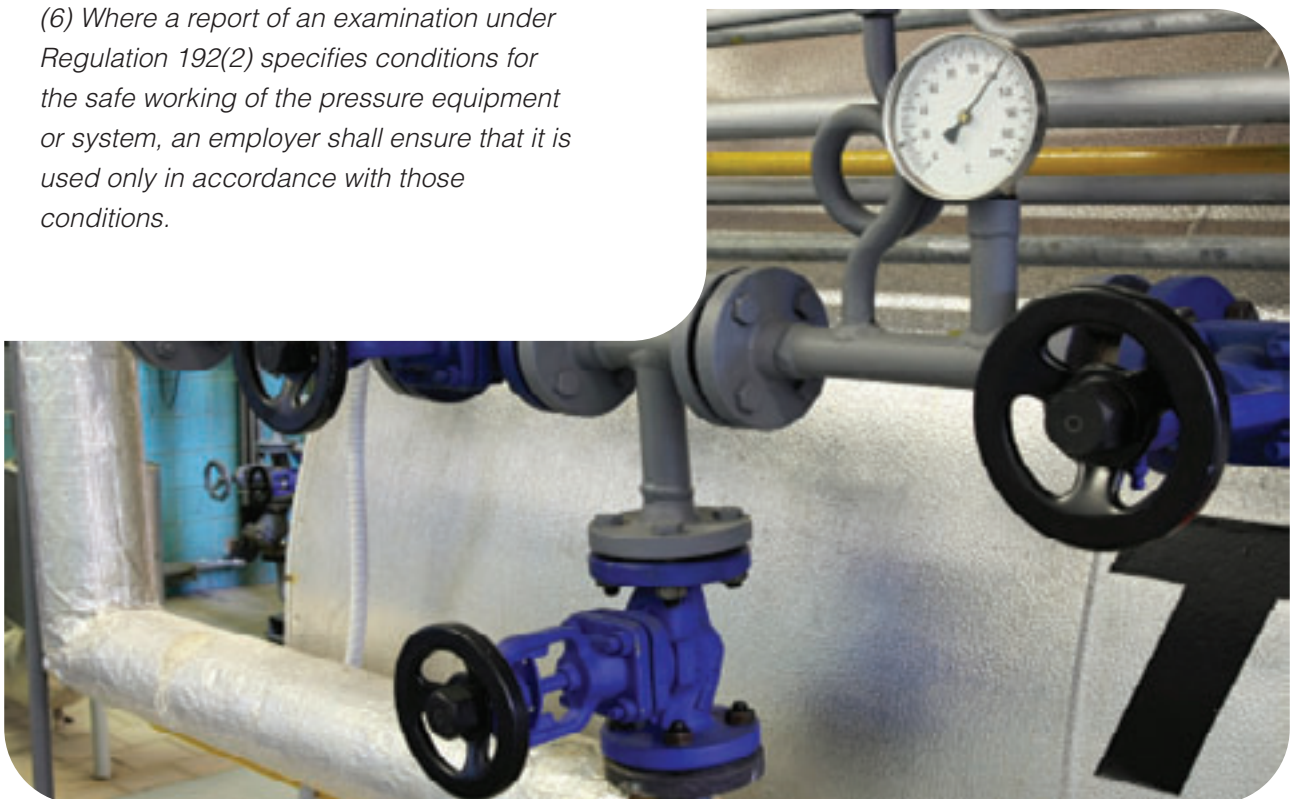
immediately connected to it e.g. an upstream pressure-reducing valve, such devices need to be examined as part of the examination.

*(5) An employer shall provide every assistance to the competent person carrying out inspections and examinations under these Regulations.*

The successful conduct of these examinations requires that the employer assists the competent person, e.g. allowing enough downtime for the completion of the examinations, provision of space, lifting equipment, access to maintenance personnel, etc.

*(6) Where a report of an examination under Regulation 192(2) specifies conditions for the safe working of the pressure equipment or system, an employer shall ensure that it is used only in accordance with those conditions.*

Following an examination a competent person may determine that equipment is usable subject to particular conditions. In this case the competent person must specify these conditions in the report of examination and the employer must ensure that the equipment is used only in accordance with those conditions.



## Regulation 192: Report by a competent person

*192. (1) A competent person carrying out an examination or test of a pressure vessel under Regulation 185(3) or 191 shall prepare a report of the result of every such examination or test which shall contain the particulars specified in Part D of Schedule 12 and shall furnish a copy of the report to the owner and user.*

*(2) Where a report referred to in paragraph (1) provides for –*

*(a) the immediate cessation of the use of a pressure vessel, or part thereof, or*

*(b) the carrying out of certain repairs or modifications necessary for the safe use of the vessel,*

*the competent person concerned shall not later than 20 days after the completion of the examination, send a copy of the report of the examination to the Authority.*

*(3) Where a report furnished in accordance with paragraph (1) states that immediate cessation of the use of the pressure vessel is required, the employer, user or owner shall ensure that the pressure vessel is not operated until the repairs or modifications, as the case may be, have been carried out.*

Regulation 192 sets out the duty for a competent person who conducts a statutory examination of a pressure vessel to produce a report of examination and give it to the owner and user. It also sets out the circumstances that require a copy of the report to be forwarded to the Health and Safety Authority.

Such examinations are separate from maintenance examinations.

Employers should satisfy themselves that the competent person has the necessary knowledge, experience, training and independence to undertake the functions required of them. A competent person may be an employee in a company's own in-house inspection department or external to the company, such as an individual person (e.g. a self-employed person) or an organisation providing independent inspection services. If the person is an employee there should be a formal procedure which ensures that he or she is in a position to exercise independent judgement.

Those responsible for the operation of pressure equipment and systems must be familiar with the contents of the reports prepared by the competent person and must comply with any conditions laid down by that person.

Repairs should not be carried out in the course of statutory examinations and the report of an examination must reflect the conditions as found.

A copy of the report of examination must be sent to the Health and Safety Authority where the report indicates that immediate cessation of use is required or certain repairs or modifications are necessary for safe use of the vessel.

*(4) A competent person carrying out an examination under Regulation 191(3) –*

## Regulation 192: Report by a competent person

*(a) may specify a longer period of examination than the period specified in column 2 of Part B of Schedule 12, in relation to a pressure vessel of a class referred to in column 1 of that Part of that Schedule, where the competent person forms the opinion that it is appropriate for the conditions of operation and the class of pressure vessel concerned and he or she shall provide the reason for the opinion in writing to the owner and user of the vessel, and*

*(b) may specify a shorter period of examination than the period specified in column 2 of Part B of Schedule 12 in relation to a pressure vessel of a class referred to in column 1 of that Part of that Schedule, where the competent person forms the opinion that a more frequent examination is required for the conditions of operation and the class of pressure vessel concerned and he or she shall provide the reason for the opinion in writing to the owner and user of the vessel.*

*(5) A competent person shall review the forming of his or her opinion referred to in paragraph (4) where an inspector in the course of his or her duties directs that a review is undertaken, and following the review the competent person shall, within 30 days of the giving of that direction if he or she is satisfied to do so, amend the interval within which an examination may take place.*

A longer period of examination intervals can be established by the competent person, taking into account such factors as:

- design details;
- method of construction;
- standards of maintenance;
- conditions of use;
- the safety record of the system;
- its current condition;
- reputable guidance;
- experience with similar plant.

Similarly the option of setting shorter intervals between examinations may be appropriate for systems operating under arduous conditions, inadequate maintenance regimes or where design or manufacturing faults have been discovered, but in any case the reason for the opinion must also be provided in writing.

Any justification of an extended or shortened period should demonstrate conclusively that the extended or reduced period is warranted in the circumstances described. If the competent person is of this opinion, he or she must record the basis of their decision in writing and give it to the owner and user of the pressure system. An inspector of the Authority can ask the competent person to review their opinion, following which, if the competent person is satisfied that the examination interval should be changed, shall do so within the given timeframe.



## Regulation 193: Keeping of records and registers of pressure vessels.

193. (1) An employer shall ensure that any report produced under Regulation 192, or a copy of it –

(a) is kept for inspection by an inspector at the place of work where the pressure vessel is permanently located, and

(b) in the case of a pressure vessel used from time to time at different places of work, is kept for inspection by an inspector, with the pressure vessel and at the address of the owner of the pressure vessel.

(2) An employer shall ensure that –

(a) a register of pressure vessels containing details of the equipment, distinguishing numbers, date of first use and date of last examination and testing is established, maintained and kept available for inspection by an inspector, and

(b) if the vessel does not have a distinguishing number or mark for the purpose of identifying the vessel on the register referred to in subparagraph (a), that one of long lasting duration is provided and placed on the vessel.

(3) The previous owner shall, on the completion of a change of ownership of a pressure vessel or, as soon as is practicable thereafter, give to the new owner any report or other written information relating to the

vessel or part thereof, as the case may be, held by him or her under this Part in relation to the pressure vessel.

Regulation 193(1) deals with the keeping of examination reports and other relevant records so that they are available at the point of use. See also Regulation 30(d) of the General Application Regulations 2007 with regard to the availability of reports to those who use the equipment.

Regulation 193(2)(a) requires the establishment of a pressure vessel register so that one can tell at a glance the scope of equipment for examination and its current status. The register may be in electronic or printed form.

If the employer has separate locations, each with its own equipment inventory, a location-specific inventory may be useful.

Regulation 193(2)(b) addresses the situation where a pressure vessel for some reason may not have a distinguishing number or mark as required by Regulation 186(a)(v). In this case, the employer is obliged to provide it with one so that accurate inspection and examination records can be maintained.

In a situation where a pressure vessel is subject to a change of ownership, Regulation 193(3) requires that the original owner passes on all records pertinent to the equipment kept under this Regulation to the new owner. Confirmation of the transfer of records should be made in writing.



## Regulation 194: Duty of persons who hire pressure equipment to others

*194. Where pressure equipment is hired out for use by others, Regulations 191 and 193 and paragraph (3) of Regulation 192 shall apply, subject to the modification that references, in those Regulations and that paragraph, to the person who hires out pressure equipment to others shall be substituted for references to the employer and any other necessary modifications.*

This Regulation mirrors the provisions of Regulation 59 of the General Application Regulations 2007 relating to the obligations of those who hire out lifting equipment. It provides that those who hire out pressure equipment for use by others must comply with the requirements relating to the examination and testing of pressure equipment under Regulation 191 and the keeping of records and registers of pressure vessels under Regulation 193. Where the report of examination requires immediate cessation of use, the vessel must be removed from hire until the necessary remedial action has been taken.



## SCHEDULE 12 Part A Regulation 184

Section 12 is divided into four parts :

Part A: Pressure systems excepted from Part 10.

Part B: Period of examinations of pressure vessels.

Part C: Marking of pressure equipment.

Part D: Information to be contained in report of examination.

Where questions arise about the application of these Regulations, Part A should be consulted to determine if the matter is within the scope of this legislation. Even if the system is excepted under Part A, it may still be work equipment to which Regulation 30 applies and, in that case, the employer must have an appropriate scheme of inspections in place.

Most sections of Part A are readily recognisable; for item 27, the bar litre value for a vessel is obtained by multiplying the volume in litres by the maximum allowable design pressure (bar). The exception in 11(a) does not apply to the load compartment of tankers such as those for the transport of flour or cement.

In respect of Part D, it may be noted that there are no prescribed forms for these Regulations but certain details or particulars are prescribed which need to appear in any report of examination used for these Regulations. Additional information may be added by the competent person as deemed necessary or useful.

### **PRESSURE SYSTEMS**

#### **Part A - Pressure systems excepted from Part 10**

*These Regulations shall not apply to –*

*1. pipelines comprising piping or a system of piping designed for the conveyance of any fluid or substance to or from an installation (onshore or offshore) starting from and including the last*

*isolation device located within the confines of the installation, including all the annexed equipment designed specifically for pipelines;*

*2. networks for the supply, distribution and discharge of water and associated equipment and headraces such as penstocks, pressure tunnels, pressure shafts for hydroelectric installations and their related specific accessories;*

*3. that part of a system which is only a pressure system because it is –*

*(a) subject to a leak test;*

*(b) pressurised unintentionally, such pressurisation being not reasonably foreseeable;*

*4. well-control equipment used in the gas, petroleum or geothermal exploration and extraction industry and in underground storage which is intended to contain and control (or both) well pressure, comprising the wellhead (Christmas tree), the blow out preventers (BOP), the piping manifolds and all their equipment upstream;*

*5. any pressure system which –*

*(a) is an electrical or telecommunications cable or is a pressurised pipe for the containment of transmission systems, e.g. for electrical power and telephone cables,*

*(b) is an enclosure for high-voltage electrical equipment such as switchgear, control gear, transformers, and rotating machines,*

*(c) contains sulphur hexafluoride gas and forms an integral part of high or medium voltage electrical apparatus,*

## SCHEDULE 12 Part A

### Regulation 184

*(d) consists of a water filled fluid coupling and used in power transmission;*

*6. equipment comprising casings or machinery where the dimensioning, choice of material and manufacturing rules are based primarily on requirements for sufficient strength, rigidity and stability to meet the static and dynamic operational effects or other operational characteristics and for which pressure is not a significant design factor including:*

*(a) engines including turbines and internal combustion engines, and*

*(b) steam engines, gas/steam turbines, turbo-generators, compressors, pumps and actuating devices;*

*7. blast furnaces including the furnace cooling system, hot-blast recuperators, dust extractors and blast-furnace exhaust-gas scrubbers and direct reducing cupolas, including the furnace cooling, gas converters and pans for melting, re-melting, de-gassing and casting of steel and non-ferrous metals;*

*8. hydraulic systems in work equipment, except for accumulators;*

*9. a pressure system which forms part of the equipment of ships, rockets, aircraft, hovercraft or hydrofoil, and mobile off-shore units, as well as equipment specifically intended for installation on board or the propulsion thereof;*

*10. a pressure system which forms part of, or is intended to form part of, a weapons system;*

*11.(a) pressure systems and equipment intended for the functioning of a wheeled, tracked or rail*

*mounted vehicle, such as equipment forming part of any braking, control or suspension system;*

*11 (b) pressure equipment associated with gas propulsion or other operating systems on motor vehicles or trailers;*

*12. pressure equipment consisting of a flexible casing, e.g. tyres, air cushions, inflatable craft and other similar pressure equipment;*

*13. exhaust and inlet silencers;*

*14. radiators and pipes used for space heating;*

*15. any water cooling system on an internal combustion engine or on a compressor;*

*16. equipment to which Regulation 56 of the Safety, Health and Welfare at Work (Quarries) Regulations 2008 (S.I. No. 28 of 2008) applies;*

*17. equipment to which Regulations 83 to 85 of the Mines (General) Regulations 1975 (S.I. No. 331 of 1975) apply;*

*18. a working chamber, manlock or an airlock within which persons work in compressed air, being work to which Part 7, Compressed Air, of the Safety, Health and Welfare at Work (Construction) Regulations 2006 (S.I. No. 504 of 2006) applies;*

*19. pressure equipment to which the following apply:*

*(a) European Communities (Carriage of Dangerous Goods by Road and Use of Transportable Pressure Equipment) Regulations 2011 (S.I. No. 349 of 2011);*

## SCHEDULE 12 Part A Regulation 184

- (b) *European Communities (Transport of Dangerous Goods by Rail) Regulations 2010 (S.I. No. 651 of 2010);*
- (c) *Merchant Shipping (Dangerous Goods) Rules 1992 (S.I. No. 391 of 1992);*
- (d) *Aeronautical Notice described as Aeronautical Notice NR 0.1, Issue 18, Date 01.02.2010 and issued by the Irish Aviation Authority*
- (e) *any statute or instrument made under a power conferred by statute or an aeronautical notice described as such and issued by the Irish Aviation Authority made for the purpose of giving effect to-*
- (i) *a provision of the Treaties governing the European Communities or an act adopted by the European Communities, or*
- (ii) *an international agreement to which the State is a party,*  
*in relation to the carriage of dangerous goods by road, rail, inland waterway, sea or air or for that purpose amending the instruments or aeronautical notice referred to in subparagraph (a), (b), (c) or (d);*
20. *pressure equipment to which the Dangerous Substances (Storage of Liquefied Petroleum Gas) Regulations 1990 (S.I. No. 201 of 1990) apply;*
21. *pressure equipment to which Regulation 9 of the Safety, Health and Welfare (Offshore Installations) (Operations) Regulations 1991 (S.I. No. 16 of 1991) apply;*
22. *vapour compression refrigeration system incorporating compressor drive motors, including standby compressor motors, having a total installed power not exceeding 25 kW;*
23. *a mobile system of the type known as a slurry tanker, and containing or intended to contain agricultural slurry, and used in agriculture;*
24. *a portable fire extinguisher with a working pressure below 25 bar at 60°C and having a total mass not exceeding 23 kilogrammes;*
25. *any part of a tool or appliance designed to be held in the hand which is a pressure vessel;*
26. *vessels designed to contain liquids with a gas pressure above the liquid of not more than 0.5 bar;*
27. *any pressure system containing a relevant fluid (other than steam) if the product of the pressure in bar and internal volume in litres of its pressure vessels is in each case less than 250 bar litres;*
28. *pressure equipment used for diving operations;*
29. *self contained breathing apparatus sets.*

# SCHEDULE 12 Part B

## Regulations 191 and 192

### Part B - Period of examination of pressure vessels\*

<b>Column 1</b> <i>Description of pressure equipment</i>	<b>Column 2</b> <i>Period within which an examination must occur</i>
<b>Category 1</b> <i>Steam and hot water boilers such as shell boilers (fired or unfired, horizontal or vertical), watertube boilers, cast iron sectional boilers.</i>  <i>Superheaters and economisers connected to boilers in this category, and steam tube ovens or hotplates.</i>  <i>Self generating autoclaves and self generating jacketed pans.</i>  <i>Coil steam generators.</i>	14 months
<b>Category 2</b> <i>Steam receivers, air receivers, autoclaves, jacketed pans and steam accumulators.</i>  <i>All other pressure vessels not listed in Category 1,</i>	26 months

\*Note: The period for any particular piece of equipment maybe subject to change pursuant to the application of Regulation 191(3)





## SCHEDULE 12 Part C Regulations 186 and 188

### **Part C - Marking of pressure vessels**

*A non-exhaustive list of information referred to in Regulation 186(a)(v) is as follows –*

- 1. The manufacturer's name.*
- 2. A serial number to identify the vessel.*
- 3. The date of manufacture of the vessel.*
- 4. The standard to which the vessel was built.*
- 5. The following specified by the manufacturer:*
  - (a) the maximum allowable pressure of the vessel;*
  - (b) the minimum allowable pressure of the vessel where it is other than atmospheric;*
  - (c) if relevant to the safe operation of the vessel, the maximum allowable temperature or the minimum allowable temperature, or both the maximum allowable temperature and the minimum allowable temperature.*
- 6. If applicable and if different to the operating limits referred to in paragraph 5, safe operating limits specified by a competent person following an examination of the vessel by that person.*





## SCHEDULE 12 Part D

### Regulation 192

#### **Part D - Information to be contained in report of examination**

1. *The name and address of the employer, user or owner for whom the examination was made.*
2. *The address of the premises at which the examination was made.*
3. *Particulars sufficient to identify the pressure vessel including, where known, its date of manufacture.*
4. *Date of this examination and date of the last examination, if known.*
5. *The safe operating limits of the pressure vessel and any associated protective devices, indicating if the immediate cessation of the use of the pressure vessel, or part thereof, is advised.*
6. *The purpose of the examination, including examination –*
  - (a) *after installation or assembly at a new site or new location*
  - (b) *after repairs or modifications, or*
  - (c) *which is periodic and where applicable, hot or cold.*
7. *In relation to every examination of pressure vessels and any associated protective devices and pressure accessories –*
  - (a) *identification of any part found to have a defect which is or could become a danger to persons and a description of the defect,*
  - (b) *particulars of any repair, renewal or modification required to remedy a defect found to be a danger to persons and the period within which the necessary remedial action is to be completed,*
  - (c) *in the case of a defect which is not yet but could become a danger to persons –*
    - (i) *particulars of any repair, renewal or modification required to remedy it, and*
    - (ii) *the period within which the required repair, renewal or modification should be completed,*
  - (d) *the latest date by which the next examination shall be carried out (and if the interval to the next examination is lesser or greater than the interval specified in column 2 of Part B a written justification shall be provided),*
  - (e) *where the examination included testing, particulars of any test,*
  - (f) *identification of parts not accessible for examination, and*
  - (g) *particulars of any further examination or test necessary to establish whether a pressure vessel is safe to use.*
8. *The name, address and qualifications of the individual making the report and, where appropriate, the name and address of the individual's employer.*





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