



SAFETY ASSESSMENT
FEDERATION

Guidelines

Pressure Systems

Guidance for the Competent Person
The Contents of PSSR Written Schemes of
Examination (WSE)

REFERENCE: PSG 09
ISSUE: 02
DATE: 18/10/2018

DOCUMENT INFORMATION:

REFERENCE:	PSG 09
ISSUE:	02
DATE:	18/10/2018
PREPARED BY:	Pressure Equipment Technical Committee (TC 01)
APPROVED BY:	TC 1 and TSC

DOCUMENT HISTORY RECORD:

ISSUE:	DATE:	CHANGE DETAIL:
02	18/10/2018	Document review

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1. Introduction and legal changes

This document is intended to give guidance to the Competent Person on what information could be found in a Written Scheme of Examination (WSE).

Following the issue of this guidance there will be a transitional period in which SAFed Member Companies adapt their systems. Guidance for the production of WSEs by Competent Persons was first published in 1990 by the Associated Offices Technical Committee (AOTC) in line with the requirements of the Pressure Systems and Transportable Gas Containers Regulations.

Since that guidance was issued the regulations have been updated and reissued as the Pressure Systems Safety Regulations (PSSR) 2000 (SI2000 No.128) and there has been considerable input to the interpretation of the regulations by the Enforcing Authorities and Competent Bodies.

This guidance is issued to reflect the changes in the legislation and to enable the Competent Bodies to take advantage of the combined experiences within SAFed and the Enforcing Authorities to apply the regulations with consistency across Industry.

Legal Changes

- The acceptance of equipment manufactured in accordance with the Pressure Equipment (Safety) Regulations 2016 and the Medical Devices Regulations 2017¹ as being properly designed and constructed². Therefore, this type of equipment is excepted from the requirements of:
 - A. Regulation 4 – The whole regulation
 - B. Regulation 5 (1) (The supply of written information relating to the design) and (4) (The markings to be placed on the vessel required by schedule 3).
- The removal of all references to Transportable Gas Containers. These are now described as Transportable Pressure Receptacles and come within the scope of other regulations.
- Clarification on Partial Exception. The 250 bar.litre threshold has been redefined to ensure that if any vessel within the system has a pressure volume product greater than 250 bar.litre then all the vessels need to be considered for inclusion in a WSE.

¹ The Medical Device Regulation exception does not apply where the relevant fluid is steam.

² Where an item of equipment does not fall under the PE(S)R or the Medical Devices Regulations 2017 then regulation 4 and 5 apply in full. This will apply to steam vessels designed with a maximum pressure below the 0.5 bar threshold for PE(S)R Items that are not CE Marked and are completed to the PE(S)R category sound engineering practice (SEP) are still considered to comply with the PE(S)R and the exceptions will apply.

2. The Written Scheme

A WSE contains information about the pressure system and the associated items of equipment within it. Apart from meeting requirements of Regulation 8, the WSE can contain other information that would be helpful to the Competent Person making examinations.

This document lists typical information that should be considered for inclusion into the WSE. There is no standard format for a WSE and no specific layout is suggested in the legislation or the associated Approved Code of Practice (L122).

Individual SAFed member companies will have their own template that meets their requirements.

3. Title Page

The table below shows a typical title page to a WSE.

Written Scheme of Examination

The Pressure Systems Safety Regulations

Statutory Instrument:2000 SI128

Title	Explanation
Scheme reference:	A simple scheme reference id.
Certified by:	The name of the person within the Competent Body who has certified the scheme, together with that body's address
Competent Person:	
Address:	
Issue date:	Date of issue and/or print
Scheme Revision No.:	Scheme revision number (Optional)
Initial Examination: (Where applicable)	Date of the initial examination for new systems (Optional)
System Category:	Minor, Intermediate or Major
User/Owner	The name and address of the User/Owner
Address	
Location of system: (If not as above)	The location of the system if not at the User/Owner premises
Scheme Description:	A short description of the scheme
Drawn Up/Updated by:	The name of the person drawing up the scheme or updating the scheme. Note: This field may appear at the end of the scheme for some member companies

4. Categorisation of a Pressure System

Pressure Systems are divided into three different categories (Minor; Intermediate or Major) depending on their size and complexity. The category into which the Pressure System is identified is an indication of the attributes and competency of the Competent Person that either certifies the Written Scheme of Examination or carries out the Examination in accordance with the Written Scheme of Examination.

In practice there is no clear dividing line between the categories however PSSR ACoP Paragraph 98 does provide some guidance as to the range of systems that would normally fall within each one.

It may be necessary on some sites to differ from the categories as defined within the ACoP. Typically this will be on complex plant (Control of Major Accident Hazard sites) where the size of vessel and relevant fluid pressure involved may fit a lower category but the nature of the process and consequences of failure may require a greater level of Engineering expertise. Where this is applied a brief explanation for the increase in category may be included.

Where a Pressure System is broken down into smaller sub-systems it is possible for each of those sub-systems to be categorised according to the size and complexity of the sub-system rather than the main system. This approach will enable the attributes of the Competent Person to be appropriate according to the category of each sub-system rather than those required for the main system.

5. General Information/Introduction — Typical assumptions

The Competent Person will need to make decisions as to how information relating to the system and the content of the WSE is conveyed to the User/Owner. This section of the guidance demonstrates how the more common issues can be addressed through the use of an introduction to a WSE. Whether this information is required as part of the scheme or as a separate document is a decision that the Competent Person must make, though where it is included as part of the WSE it is unlikely to become separated.

This section of the WSE may be used to detail any assumptions or limitations that apply to the WSE content. When drawing up WSEs, certain assumptions may be made, e.g. the Competent Person may assume that Regulation 12 - Maintenance, is being satisfied, or that the safety valves and vent arrangements have been correctly sized for the application.

It may therefore be appropriate to point out these assumptions to the User/Owner in the first part of the WSE. It is also of benefit to understand the decisions that have been made and the Engineering judgement applied.

Typical Assumptions:

1. The user is expected to meet the requirements of Regulation 11 - Operation and Regulation 12 - Maintenance in order to ensure the plant continues to be kept in a safe condition between the examinations required as part of the WSE.
2. It is assumed that all protective devices, including any relief streams, have been correctly designed to prevent a dangerous situation from occurring under foreseeable operating and fault conditions.
3. The User/Owner is responsible for the scope of the WSE and it is their responsibility to ensure that the schedule of plant within the WSE is correct and maintained up to date.

6. Initial Examinations

This section may also include a reference to “Initial” Examinations and any requirements that may be applied where a new system is first brought into service or where an individual plant item within the WSE is replaced, alternatively it may be covered in the examination procedures - this decision is left to the Competent Person.

Where the introduction is used then a suggested wording;

“All pressure vessels, protective devices and pipework forming part of, or subsequently added to this system should be assessed by a Competent Person when the installation is complete and an initial examination carried out as required. Where required this examination should be completed before the item is used for the first time. This advice should apply to items added to the system that may subsequently be excluded from the requirements of routine examination within the Written Scheme”.

7. Safe Operating Limits

There is no requirement within the Regulations for the safe operating limit to be included in a WSE however, where it is included the context should be made clear, e.g. safe operating limits of individual items may be different from the system safe operating limits.

8. Plant Changes

Many pressure systems are amended over time, with plant items being replaced or systems being extended. The User/Owner must be aware that they must inform the Competent Person where changes have occurred.

Suggested wording:

Items of plant may be added or removed from the system over the period between reviews. It is the responsibility of the owner/user to inform the Competent Person when this occurs to allow for the necessary updates to the Written Scheme.

9. Repairs / Modifications

The ACoP states that the WSE should identify those critical parts of the system which, if modified or repaired, should be examined by a Competent Person before it is used again.

In most circumstances the plant schedule lists those plant items that should be subject to examination during/following repairs or modification.

Suggested wording:

All items listed in the schedule of plant are considered critical parts of the system which, if subject to substantial modification or substantial repair, should be referred to the Competent Person before the modification or repair is carried out.

Refer to Section 15 - Modification and Repair.

10. Application of Other Legislation

There may be an assumption by the User/Owner that where an item of plant is examined as part of a PSSR WSE then the requirements of other legislation will also be met. It may be useful to inform the User/Owner that other legislation may be applicable.

Suggested wording:

The periodicity of examination and the content of the examination procedures are aimed at preventing injury to personnel due to the release of stored energy as required by the Pressure System Safety Regulations 2000 (PSSR). Examinations completed for PSSR may not be sufficient to satisfy the requirements of other legislation e.g. The Control of Major Accident Hazards Regulations 2015

11. System Information

The purpose of this section of the WSE is to provide details of the pressure system to be taken into account when carrying out examinations.

The contents of this part may include (though not necessarily restricted to):

- Description of Pressure System. Provides an overview of the system and the associated process.
- The Extent of the Pressure System. For more complex pressure systems it is often more practical to break the system into smaller sections or sub systems. The boundaries of these sub systems need to be clearly defined, e.g. walls of buildings, specific valves etc or as specified on referenced drawings etc.
- Cross Reference to other Pressure Systems. Provides information on any other inter-connected system.
- Detail of Relevant Fluid and other Fluids likely to cause deterioration. Provides information on potential degradation or damage mechanisms that may be attributed to the fluid and the materials of construction.
- Operating Conditions. This may include start up, shutdown, cyclic loads, foreseeable excursions etc.
- Reference to Drawings etc. Identifies the plant items within the pressure system.

Note: There is no requirement to have a drawing though it may be considered best practice for complex systems. The user must keep drawings up to date.

12. Plant Schedule Information

The contents of the schedule may include (though not necessarily restricted to):

- Competent Person/User reference/Description of plant item/Serial number - Used for identifying plant items.
- Safe Operating Limits (SOL) – Though not required in the legislation, where included within the plant schedule, it should be clear whether they relate to the safe operating limits of the individual plant item or to the system as a whole.

Note: SOLs other than pressure and temperature may apply.

- Periodicity of Examinations – In most circumstances an Out of Service examination followed by an In-Service examination will be specified and the requirements of the WSE will not have been fulfilled until they have both been carried out. In addition Intermediate In-Service examinations between Out of Service/In-Service examinations may be included in the WSE. The maximum interval between each type of examination must be given in the schedule of plant
- Examination Procedure Reference - The nature of the examination required is an essential part of the WSE. This is usually achieved through the use of examination procedures which are referenced in the plant schedule.

Note: Some plant items may have additional examination requirements due to operating conditions, design etc. These requirements may be recorded either in the procedure or in another section of the scheme. Whichever method is used the User/Owner and Competent Person must be able to readily identify the additional requirements as part of the examination.

- Drawing Reference – This can be useful on more complex systems.
- Additional information can be given in the plant list where required; Other useful information may include;
 - Makers Name
 - Construction Date
 - Design Codes
 - Design Pressures.

13. Periodicities

The User/Owner and the Competent Person need to know what examinations are required and when. The requirements may include other specified tests e.g. hydraulic testing, non-destructive testing etc, which may be carried out at different periodicities to the out of service or in service examinations.

Periods between other specified tests may be included in different sections of the WSE e.g. in the examination procedure, where additional examinations may be required due to the specific nature of the plant.

Whichever approach is taken the Competent Person/User Owner must be able to readily identify the periodicity of all examinations.

14. Plant Excluded From Written Scheme of Examination

There is no requirement under PSSR Regulation 8 to detail the parts of the system that do not require an examination under the WSE, however, it may be considered best practice to include a section within WSEs to detail excluded parts of a system.

This will document those parts that have been excluded from the requirements for examination by a Competent Person and the basis for the exclusion e.g. for pipework this may include a reference to SAFed Guidance Document PSG05 “Guidelines for Competent Person In-service examination of pressure systems pipework”.

Suggested wording:

The pressure equipment in this list of plant is excluded from examination by the Competent Person. The plant is of a size and nature or installed in a location so as not to constitute a danger in the event of failure or these plant items are not considered to be subject to significant mechanical deterioration.

The User/Owners attention is drawn to the other requirements of The Pressure Systems Safety Regulations and in particular to the regulations concerning the Operation (Regulation 11) and Maintenance (Regulation 12) of the system.

Other health & safety regulations may also apply to these items. e.g. The Provision and Use of Work Equipment Regulations (PUWER 98).

Additionally, items that are specifically excluded under Schedule 1 Part I and Part II of the Pressure Systems Safety Regulations 2000 are not normally listed.

15. Modifications and Repairs

The responsibility for any modification or repair rests with the employer of the person engaged to carry out the repair or modification. The User/Owner should inform the Competent Person of any proposed Modification or Repair to those parts listed in the schedule of the WSE before work begins.

Modifications

All modifications (including extensions or additions) to the pressurised parts of the system should be supported by adequate documentation and this should take into account the original design specification.

Also to be considered are the effects that such modifications have on the integrity of the pressure system and the duty for which the system is to be used after the modifications. The Competent Person should be made aware of all such modifications prior to commencement of the work.

It should be noted that a change in relevant fluid constitutes a modification and therefore consideration should be given to the effects of that change on the system and SOL.

Repairs

It is necessary to investigate the cause of any failure of a part of a pressure system before a suitable repair can be carried out. The Competent Person should be informed of all failures requiring repair.

All repairs to pressure parts of a system must only be undertaken by suitably qualified personnel and should be designed in accordance with appropriate standards.

In some circumstances modifications and repairs may be covered by the Pressure Equipment (Safety) Regulations Whilst the PE(S)R applies to the first placing on the market and putting into service of pressure equipment, some modifications or repairs could be considered to fall within the scope of the PE(S)R.

The complete replacement of an item is considered to be covered by the PE(S)R. Repairs and modifications are not covered by the PE(S)R unless they substantially alter the original characteristics, purpose and/or type of equipment. Each case should be treated on its merits but some examples such as a complete replacement shell or a spare heating battery would be likely to come under the PE(S)R.

Modification or repair of pipework will not come within the requirements of PE(S)R when the content, main purpose and safety systems remain essentially the same or when the work is carried out under the control of the user of the equipment. Otherwise new pipework systems being installed would come within PE(S)R

See Guidelines 1/3, 1/4 and 3/2 on the Europa website:

http://ec.europa.eu/enterprise/pressure_equipment/ped/guidelines/index_en.html

16. Type and Frequency of Reviews

In accordance with Regulation 8 (2)(b) the content of the WSE should be reviewed at regular intervals by a Competent Person. Where any recommendation with regard to the content of the WSE is made during the review the User/Owner shall ensure that the WSE is amended accordingly.

With most “minor” schemes, this may be done on an ongoing basis every time the plant undergoes its examinations under Regulation 9 (5)(d). This is reported within a specific section of the examination report that states the WSE remains suitable or requires amendment. This review is limited to each individual plant item and its associated protective devices reported on.

Where there are numerous items, complex processes and flow patterns, different materials, possible difficult environments etc. within the system then this review must be more formal and comprehensive. The review must involve the User/Owner along with the competent person. The User/Owner may wish to include, plant operators, process and engineering managers and /or experts considered necessary for the safe operation of the plant.

It should be ensured that the review takes into consideration, changes, history and events that have or may have an effect on the deterioration modes that may be encountered.

The review results should be recorded and it may be best practice for this to be in the scheme, signed and dated by the Competent Person stating that the WSE is suitable

Where separate documents are raised to support a review of a WSE a reference to the document should be made in the review record.

The frequency of review should be based on the nature and complexities of the plant and the anticipated deterioration modes. This should not exceed 4 years (50 months) or the longest examination interval of any plant item, listed within the scheme schedule, whichever is greater.

Note: Where a WSE specifies a date for the next review this must not be exceeded.

The WSE should be reviewed and amended accordingly by the competent person at the time of the following :-

- The addition or deletion of plant within a system.
- Significant repairs and/or modifications.
- Before any change to the relevant fluid.
- The change in SOL of any part following an examination.
- Recommendations of technical changes in a report issued by a competent person.
- Where a change in periodicity of any part of a system is agreed this cannot be applied before the report of examination is issued.

17. Changes to a Written Scheme issued by others

When amendments are required and where the Competent Person completing examinations in accordance with a WSE is not the Competent Person that issued the scheme there are options to be considered by the User/Owner and Competent Person.

- To have the scheme amended by the Competent Person that issued the scheme. This could be implemented using appropriate comments on the examination reports.
- Produce a new certified WSE to reflect the changes to the system.
- Amendment of the scheme by the examining body, or minor amendments within the competency of the examining engineer, these can be hand annotated to the scheme. These amendments must be signed and dated. The Competent Person that certifies the amendment to the scheme needs to consider the implications on the rest of the system/scheme.

Note: For more complex systems this may not be considered best practice and is not possible if the scheme is held on a computer system. Section 20 should be adhered to regarding changes to the existing scheme.

18. Examination Procedures and the use of Standard Examination Procedures

Typically procedures will contain information as detailed below;

- A title and introduction.
- Safety information where considered necessary. These are aimed at ensuring the Competent Person (Examination) is aware of any specific risks that may be present whilst undertaking the examination activity.
- Preparation which the User/Owner is required to undertake in order to facilitate the examination.
- A description of the examinations to be carried out. This should make it clear to the user if any additional testing is going to be carried out on the plant item.
- A section to cover additional examinations that may be required due to the specific nature of the plant.

The use of Standard Examination Procedures

There are some items of plant that will require the same level, frequency and techniques to be used no matter where the equipment is installed. The very nature of the plant is generic.

Where this type of equipment is operating in similar environments it is practicable to use a “standard” examination procedure for the plant.

Before a standard examination procedure is used, it must be confirmed that equipment is suitable for that procedure.

For example standard examination procedures may be considered for;

Welded Air Receivers (of Carbon Steel)

Packaged Refrigeration Systems

Boilers (Standard packaged)

Low Risk Steam Pipework

Jacketed Vessels (Unlined)

Pressurization Vessels

Desiccant Filled Air Dryer Vessels

Domestic Hot Water and Heating Shell & Tube Calorifiers.

Cafe Boilers

(The list is not exhaustive).

19. Relevant Guidance and Codes of Practice

There are many documents referenced during the development of a WSE and it would not be practicable to list them all. The list below may be considered sufficient.

- HSC Approved Code of Practice L122 – Safety of Pressure System
- HSE Guidance Note GS4 – Safety in Pressure Testing
- SAFed Guidance PSG1 – Guidelines on the Periodicity of Examinations
- SAFed Guidance PSG5 Guidelines for Competent Persons – In-service examination of pressure systems pipework.
- SAFed Guidance PEC02 – Size of access openings in boilers and pressure vessels.

Where specific documents have been used to create the examination procedure then it would be good practice to list these in the specific procedure.

20. Maintenance of Records – Updates to schemes

The review history should be recorded in the WSE and the scheme should have a unique issue number or date. When a copy of the scheme or WSE is being used by the CP, the CP must ensure that the copy is consistent with the master WSE.

21. Report of Examination³

Each examination report should clearly state the WSE that the examination has been carried out in accordance with, including its issue number (or where no issue number is given the date of the WSE).

Each report must carry a statement as to the suitability of the WSE, in respect of the plant item(s) on the report. Where a change is required then details of the changes should be given.

Where the Competent Person is to issue a report certifying the plant item for a shorter period than quoted in the WSE, a clear explanation should be given on the examination report.

³ Reporting is not considered as part of the WSE content.