

1663

## STATUTORY INSTRUMENTS

1964 No. 781

### FACTORIES

#### The Examination of Steam Boilers Regulations 1964

Made - - - -	26th May 1964
Laid before Parliament	4th June 1964
Coming into Operation	27th June 1964

#### The Minister of Labour—

(a) by virtue of the powers conferred on him by section 33(2) and (3) and section 180(3) of the Factories Act 1961(a) and of all other powers enabling him in that behalf; and

(b) after publishing, pursuant to Schedule 4 to the said Act of 1961, notice of the proposal to make the Regulations and not having received any objection to the draft in regard to which he is required by the said Schedule to direct an inquiry to be held,

hereby makes the following special Regulations:—

#### Citation and commencement

1. These Regulations may be cited as the Examination of Steam Boilers Regulations 1964 and shall come into operation on 27th June 1964. Provided that as respects any steam boiler that was thoroughly examined by a competent person before the coming into operation of these Regulations they shall not apply until its first examination thereafter; so, however, that the interval between the said two examinations shall not in the case of any boiler exceed the relevant period prescribed by Regulation 4 or, in the case of a boiler as respects which an exemption order was in force immediately before the coming into operation of these Regulations, such greater period as may be specified in the exemption order.

#### Interpretation

2.—(1) The Interpretation Act 1889(b) shall apply to the interpretation of these Regulations as it applies to the interpretation of an Act of Parliament.

(2) In these Regulations, unless the context otherwise requires, the following expressions have the meanings hereby assigned to them—

“excepted boiler” means a boiler belonging to or exclusively used in the service of Her Majesty or belonging to and used by the United Kingdom Atomic Energy Authority or the boiler of any ship or of any locomotive which belongs to and is used by any railway company;

“exemption order” means an order made, or having effect as if made, under the substituted subsection (3A) of section 33 set out in paragraph 3 of Schedule 6 to the principal Act;

(a) 9 & 10 Eliz. 2. c. 34.

(b) 52 & 53 Vict. c. 63.

- Boiler Explosions Acts, 1882 and 1890. – Ceased 1<sup>st</sup> Jan 1975
- Factories Act 1964 (Excluded locomotives in railway companies, but included locomotives in factories)

## ❖ Why exclude railway companies?

Self regulating  
Safety Management System  
Risk assessment's

### Health and Safety at Work etc. Act 1974

#### CHAPTER 37

#### ARRANGEMENT OF SECTIONS

##### PART I

HEALTH, SAFETY AND WELFARE IN CONNECTION  
WITH WORK, AND CONTROL OF DANGEROUS SUBSTANCES  
AND CERTAIN EMISSIONS INTO THE ATMOSPHERE

##### *Preliminary*

Section

##### 1. Preliminary.

##### *General duties*

2. General duties of employers to their employees.
3. General duties of employers and self-employed to persons other than their employees.
4. General duties of persons concerned with premises to persons other than their employees.
5. General duty of persons in control of certain premises in relation to harmful emissions into atmosphere.
6. General duties of manufacturers etc. as regards articles and substances for use at work.
7. General duties of employees at work.
8. Duty not to interfere with or misuse things provided pursuant to certain provisions.
9. Duty not to charge employees for things done or provided pursuant to certain specific requirements.

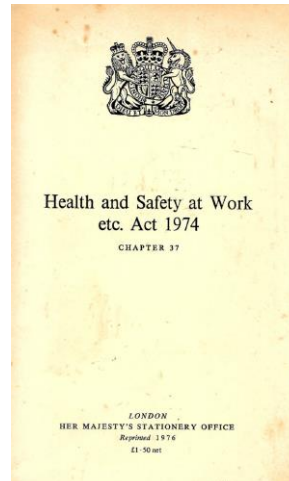
##### *The Health and Safety Commission and the Health and Safety Executive*

10. Establishment of the Commission and the Executive.
11. General functions of the Commission and the Executive.
12. Control of the Commission by the Secretary of State.
13. Other powers of the Commission.
14. Power of the Commission to direct investigations and inquiries.

##### *Health and safety regulations and approved codes of practice*

15. Health and safety regulations.
16. Approval of codes of practice by the Commission.
17. Use of approved codes of practice in criminal proceedings.

A



##### *Preliminary*

1.—(1) The provisions of this Part shall have effect with a Preliminary view to—

- (a) securing the health, safety and welfare of persons at work ;
- (b) protecting persons other than persons at work against risks to health or safety arising out of or in connection with the activities of persons at work ;

- At work
- Employers

##### **PART I**

**General duties  
of employers  
and self-  
employed to  
persons other  
than their  
employees.**

3.—(1) It shall be the duty of every employer to conduct his undertaking in such a way as to ensure, so far as is reasonably practicable, that persons not in his employment who may be affected thereby are not thereby exposed to risks to their health or safety.

(2) It shall be the duty of every self-employed person to conduct his undertaking in such a way as to ensure, so far as is reasonably practicable, that he and other persons (not being his employees) who may be affected thereby are not thereby exposed to risks to their health or safety.

- Non employees
- Not just the employer
- To prevent harm

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## STATUTORY INSTRUMENTS

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2016 No. 1105

### CONSUMER PROTECTION

#### HEALTH AND SAFETY

##### The Pressure Equipment (Safety) Regulations 2016

<i>Made</i>	- - - -	<i>15th November 2016</i>
<i>Laid before Parliament</i>		<i>16th November 2016</i>
<i>Coming into force</i>	- -	<i>8th December 2016</i>

The Secretary of State is a Minister designated(a) for the purposes of section 2(2) of the European Communities Act 1972(b) in relation to pressure equipment and assemblies of pressure equipment.

These Regulations make provision for a purpose mentioned in section 2(2) of the European Communities Act 1972 and it appears to the Secretary of State that it is expedient for certain references to provisions of EU instruments to be construed as references to those provisions as amended from time to time.

The Secretary of State makes these Regulations in exercise of the powers conferred by section 2(2) of, and paragraph 1A(c) of Schedule 2 to, the European Communities Act 1972.

#### PART 1

##### Preliminary

##### Citation and commencement

1. These Regulations may be cited as the Pressure Equipment (Safety) Regulations 2016 and come into force on 8th December 2016 ("the commencement date").

##### Interpretation

2.—(1) In these Regulations—

"the 1974 Act" means the Health and Safety at Work etc Act 1974(d);

- 
- (a) S.I. 1998/2793.  
(b) 1972 c.68. Section 2(2) was amended by section 27(1)(a) of the Legislative and Regulatory Reform Act 2006 (c.51) and by Part 1 of the Schedule to the European Union (Amendment) Act 2008 (c.7). The enabling powers of section 2(2) were extended by virtue of the amendment of section 1(2) by section 1 of the European Economic Area Act 1993 (c.51).  
(c) Paragraph 1A of Schedule 2 was inserted by section 28 of the Legislative and Regulatory reform Act 2006 and amended by Part 1 of the Schedule to the European Union (Amendment) Act 2008.  
(d) 1974 c.37.

- Pressure Equipment Directive.  
First in 1997 amended 2014
  - Directive 97/23/EC
    - ❖ SI 1999/2001
  - Directive 2014/68/EU
    - ❖ SI 2016/1105
- Pressure Equipment Safety  
Regulations 2016 (SI 2016/1105)  
also known as PSR
- Pressure Systems Safety  
Regulations 2000 (SI 2000/128)  
also known as PSSR
  - ❖ 2<sup>nd</sup> edition 2014
  - ❖ Amended by SI 2016/1105

## STATUTORY INSTRUMENTS

2000 No. 128

### HEALTH AND SAFETY

#### The Pressure Systems Safety Regulations 2000

Made	- - -	20th January 2000
Laid before Parliament		31st January 2000
Coming into force		21st February 2000

#### ARRANGEMENT OF REGULATIONS

##### PART I INTRODUCTION

1. Citation and commencement.
2. Interpretation.
3. Application and duties.

##### PART II GENERAL

4. Design and construction.
5. Provision of information and marking.
6. Installation.
7. Safe operating limits.
8. Written scheme of examination.
9. Examination in accordance with the written scheme.
10. Action in case of imminent danger.
11. Operation.
12. Maintenance.
13. Modification and repair.
14. Keeping of records, etc.
15. Precautions to prevent pressurisation of certain vessels.

##### PART III MISCELLANEOUS

16. Defence.
17. Power to grant exemptions.
18. Repeals and revocations.
19. Transitional provision.

[DETR 1705]

Rob Le Chevalier  
Engineering Manager / Director  
South Devon Railway Engineering Ltd.

- PSSR references,
  - ACOP Guidance notes and requires,
  - Written Scheme of Examination
  - Keeping of records

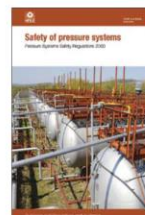


Health and Safety  
Executive

## Safety of pressure systems

Pressure Systems Safety Regulations 2000

### Approved Code of Practice and guidance



L122 (Second edition)  
Published 2014

The Pressure Systems Safety Regulations 2000 (PSSR) cover the safe design and use of pressure systems. The aim of PSSR is to prevent serious injury from the hazard of stored energy (pressure) as a result of the failure of a pressure system or one of its component parts.

The revised PSSR ACOP and guidance is aimed at dutyholders under PSSR who are involved with pressure systems used at work. It is for users, owners, competent persons, designers, manufacturers, importers, suppliers and installers of pressure systems used at work.

Since the last edition, the ACOP and guidance has been updated for clarity. The content has not been radically changed, as it was fit for purpose. The main changes to this publication are as follows:

- The decision tree on whether PSSR applies has been moved to the front of the book and explanatory notes have been added to it, to help readers decide if PSSR applies to them or not
- A new Appendix has been added to provide clarity on how to apply PSSR in a proportionate manner to small pressure vessels in schools
- The section on the legal background to PSSR and related legislation has been removed as it was out of date

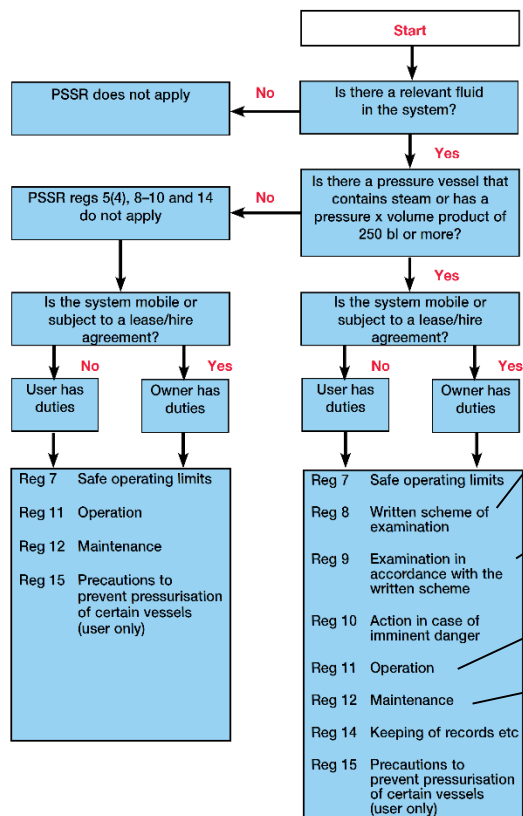
The Regulations themselves have not changed at all, so dutyholders' responsibilities remain unchanged.

## Applies to steam locomotive boilers

## Regarding Inspection:-

Determining when and how to examine needs to be influenced by risk assessment, good practice and the original railway inspection regimes.

Figure 1 User/owner decision tree: Do the Regulations apply to my pressure system?



## Written Scheme of Examination

Examination

Operation

Maintenance

Keep Records



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*Status: This is the original version (as it was originally made). This item of legislation is currently only available in its original format.*

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## STATUTORY INSTRUMENTS

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**1998 No. 2306**

### HEALTH AND SAFETY

The Provision and Use of Work Equipment Regulations 1998

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## STATUTORY INSTRUMENTS

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**2002 No. 2174**

### HEALTH AND SAFETY

The Health and Safety (Miscellaneous Amendments)  
Regulations 2002

## PUWER section 5 and 6

Every employer shall ensure that work equipment is maintained in an efficient state.

These plus much other legislation are there to instruct how to make the equipment and its use safe to the users and anyone who may be effected by the equipment.

Cornerstone of this is Risk Assessment

Need to determine what is safe  
What is the experience of others

Good practice  
Guidance notes  
Risk assessment

**Make sure nobody is hurt**





# The South Devon Railway

Railway Group Standard

GM/RT2003

Issue ONE

Date December 1996

## Certification Requirements for Registration of Steam Locomotives

### Synopsis

This standard defines the certification requirements for Steam Locomotives that are required to enable them to be registered for operation on Railtrack controlled infrastructure. The audit requirements for their continued operation are also defined.

Signatures removed from electronic version

Submitted by

Nominated Responsible Manager

Approved by

Authorised by

M. H. Walter  
Controller, Safety Standards

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Safety & Standards Directorate,  
Railtrack PLC,  
Floor 2, Fitzroy House,  
355 Euston Road,  
London NW1 3AG

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## General Boiler Examination

An internal boiler examination having the same content as that defined in the 7 yearly Internal Boiler Examination defined in MT/276.

## General Mechanical Examination

A locomotive examination having the same content as that defined in the 7 Yearly Heavy Mechanical Examination defined in MT/276.

5.1.7 Where locomotives detailed in sub-paragraph 5.1.6 are proposed for registration, the boiler of such locomotives shall be the subject of valid and satisfactory hydraulic and steam test certificates. Full records detailing all work carried out at the last General Boiler Examination shall be made available to the Certification Body. Such repairs shall be strictly in accordance with the requirements contained in MT/276 and the normal period for General Boiler Examination, defined in sub-paragraph 5.2.8 shall not be exceeded. If full adherence to the requirements of MT/276 cannot be demonstrated, the boiler shall be subjected to a General Boiler Examination and satisfactory hydraulic and steam pressure tests prior to registration.

New RSSB engineering requirements  
for steam locomotives RIS-4472-RST  
Nov 2017

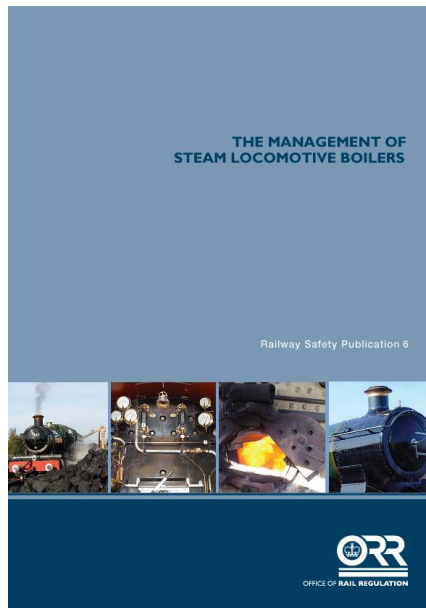
If I don't run on the network then I can  
ignore it!  
OK, but are you safe?  
When it hurts someone what will be  
your defence?

Rob Le Chevalier  
Engineering Manager / Director  
South Devon Railway Engineering Ltd.

EXAMINATION SCHEDULE FOR  
PRESERVED STEAM LOCOMOTIVES  
RUNNING ON BR LINES  
BR PUBLICATION NO MT/276  
REVISION LETTER NO 1

MT276 Requires No NDE Inspection.

For boilers does not dictate the  
inspection methods for NDE beyond,  
visual, pressure and hammer testing.

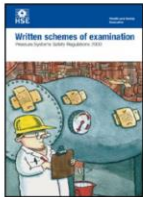


Rail safety publication 6 (HSG 29)  
Has guidance on testing but  
nothing on NDE



## Written schemes of examination

Pressure Systems Safety Regulations 2000



This is a web-friendly version of leaflet INDG178(rev2), published 11/12

Under the Pressure Systems Safety Regulations 2000, users and owners of pressure systems are required to demonstrate that they know the safe operating limits (principally pressure and temperature) of their systems, and that they are safe under those conditions.

They need to ensure that a suitable written scheme of examination is in place before the system is operated. They also need to ensure that the system is actually examined in accordance with the written scheme of examination.

This publication complements the HSE leaflet *Pressure systems: A brief guide to safety*. It provides guidance on drafting written schemes of examination, but it cannot cover all relevant aspects of the Regulations. The 'Find out more' section at the end of the leaflet lists detailed guidance.

### What is a written scheme of examination?

A written scheme of examination is a document containing information about selected items of plant or equipment which form a pressure system, operate under pressure and contain a 'relevant fluid'.

The term relevant fluid is defined in the Regulations and covers compressed or liquefied gas, including air, at a pressure greater than 0.5 bar (approximately 7 psi) above atmospheric pressure; pressurised hot water above 110 °C; and steam at any pressure. Typical contents of a written scheme of examination include:

- identification of the items of plant or equipment within the system;
- those parts of the system which are to be examined;
- the nature of the examination required, including the inspection and testing to be carried out on any protective devices;
- the preparatory work needed for the item to be examined safely;
- where appropriate, the nature of any examination needed before the system is first used;
- the maximum interval between examinations;
- the critical parts of the system which, if modified or repaired, should be examined by a competent person before the system is used again;
- the name of the competent person certifying the written scheme of examination; and
- the date of certification.

How to determine:-

What to inspect

When to inspect

How to inspect

Who does the inspection

What to record

## Non Destructive Examination, NDE

In service, at washouts

Mainly in house, visual – flair lamp (LED) endoscope (borescope), Mirrors  
Acoustic by hammer test , sound in steam

Annual service and Examination

Mainly in house, visual, - flair lamp (LED) , endoscope (borescope)  
Acoustic by hammer test and ultrasonic thickness testing, Dye Pen, MPI,  
AND examined by the Competent person to verify thickness checks and provide an  
independent view

7/10 Year Examination

In house, as with the annual exam plus any areas included in the written scheme  
of examination as determined by the Competent Person

New components

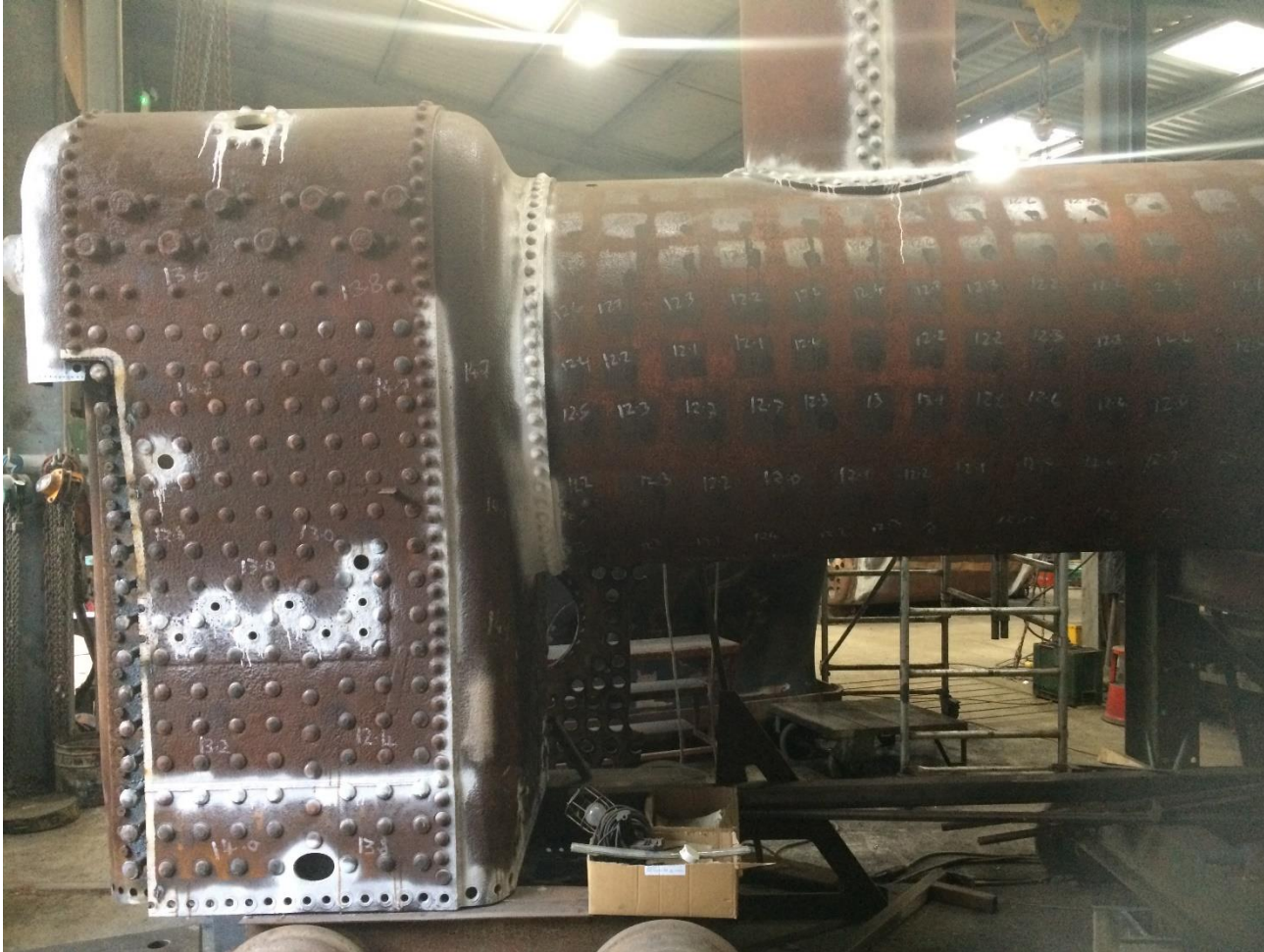
As required by the Competent Person

**Scope of Initial Locomotive Boiler NDE – Great Western Railway(GWR)**  
**No.1369.**

- (a) Firebox Outer Wrapper (Carbon Steel)
  - All backplate wrapper weld attachments and valve pads subjected to 100% MPI.
  - Backplate door ring region subjected to 100% MPI and also UT thickness mapping(external) from plate transition/door radii locations.
  - Backplate corner radii(both LHS & RHS) subjected to UT thickness mapping extending vertically downwards from top corner wash-out plug to foundation ring level.
  - Backplate(both LHS & RHS) subjected to UT thickness mapping extending vertically downwards to plate regions between the outside rows of last two vertical rows of stays and towards the above corner radii locations.
  - LHS outer wrapper horizontal repair weld(~12" from FR) subjected to 100% MPI.
  - RHS outer wrapper horizontal repair weld(~12" from FR) subjected to 100% MPI.
  - Throatplate subjected to UT thickness mapping.
  - All crown wrapper weld attachments and valve pads subjected to 100% MPI.
  - Crown wrapper regions around both safety valve pad and whistle pad locations subjected to localised UT thickness mapping.
  - All mudhole door penetrations and existing wash-out plug regions subjected to 100% MPI.
  - All exposed outer wrapper plate foundation ring stay holes/ligaments subjected to 100% MPI.
  - All existing copper side, back and throat plate stays subjected to 100% long range(LR) ultrasonic testing regime.
- (b) Firebox Inner Wrapper (Copper – C107)
  - Firebox tubeplate subjected to 100% DPI to all plate/tube ligament regions.
  - Firebox vertical corner regions(4 off) subjected to 100% DPI for the full plate height and extending around corner radii towards stay holes/ligaments.
  - Exposed firebox foundation ring stay holes/ligaments subjected to 100% DPI.
- (c) Foundation Ring (Carbon Steel)
  - Removed and subjected to 100% UT and MPI at all corner radii locations.
- (d) Boiler Barrel (Carbon Steel)
  - Riveted firebox to barrel joint subjected to MPI at clock co-ordinates of 3, 6, 9 and 12 o'clock positions respectively.
  - Boiler barrel strake(1 off) subjected to shell UT thickness mapping. Additional concentrated UT thickness measurements at the lower shell locations between 4 o'clock to 8 o'clock positions.
  - Boiler barrel longitudinal welded joint subjected to 100% UT and MPI.
  - Riveted boiler barrel dome joint subjected to 100% MPI.
- (e) Smoke Box (Carbon Steel)
  - Smokebox tubeplate subjected to 100% MPI to all plate/tube ligaments, weld attachments and wash-out plug locations.
  - Smokebox tubeplate subjected to UT thickness mapping. Additional concentrated UT thickness measurements to the lower tubeplate between 3 o'clock and 9 o'clock positions and around lower wash-out plug(s).

- Example of scope of work from the Competent person to an approved NDE engineer

# The South Devon Railway



- Boiler after NDE

Rob Le Chevalier  
Engineering Manager / Director  
South Devon Railway Engineering Ltd.





- New firebox of welded construction after NDE



# The South Devon Railway

Ref No: HGR-B9220  
Issue No: 01  
Issue Date: October 2014

Ref No: HGR-B9160  
Issue No: 01  
Issue Date: November 2014

## HERITAGE RAILWAY ASSOCIATION

### GUIDANCE NOTE

#### MATERIALS & Non-Destructive Testing

Supporting the Steam Locomotive Boiler series of Guidance Notes

##### Purpose

This document describes good practice in relation to its subject to be followed by Heritage Railways, Tramways and similar bodies to whom this document applies.

##### Endorsement

This document has been developed with, and is fully endorsed by, Her Majesty's Railway Inspectorate (HMRI), a directorate of the Office of Rail Regulation (ORR).

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## HERITAGE RAILWAY ASSOCIATION

### GUIDANCE NOTE

#### EXAMINATION IN SERVICE of Steam Locomotive Boilers

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Rob Le Chevalier  
Engineering Manager / Director  
South Devon Railway Engineering Ltd.

Highly dependent on the view of the Competent Person

Uniformity of approach to the application of NDE using traditional and new methods

Recommend alignment of expectations of the 'Competent Person' and the HRA to capture best practice for steam locomotive boilers for future operations