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RAILINFRASTRUCTURE CORPORATION

Discipline
Rolling Stock Engineering Standard

Category
Inspection

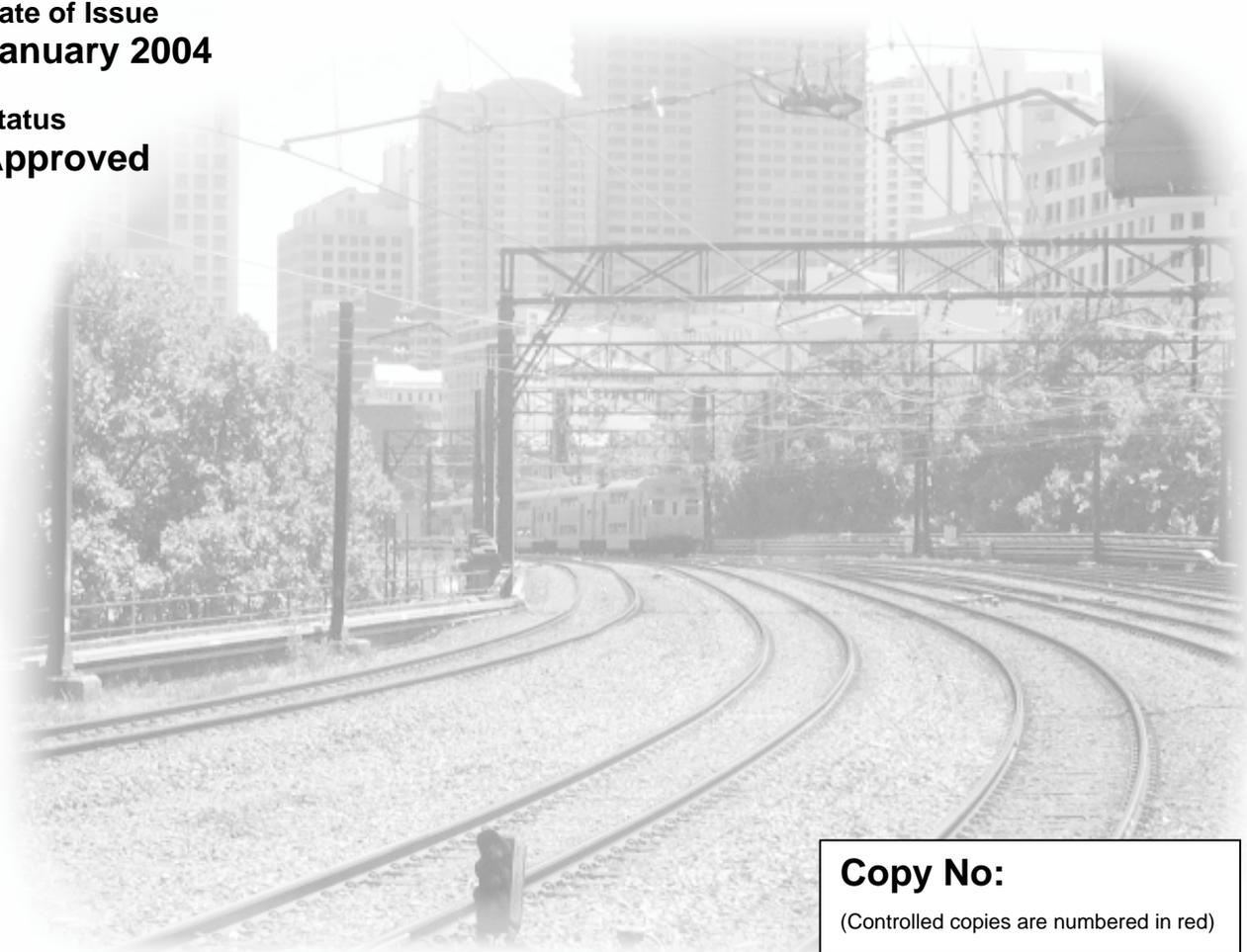
Title
**INSPECTION OF UNFIRED 'EXEMPT' PRESSURE
VESSELS**

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About This Standard

This standard is based on TRS 1449 Inspection Requirements for Unfired 'Exempt' Pressure Vessels

Owners and users of pressure equipment are to implement Australian Standard as 3788 'boilers and pressure vessels - in - service inspection requirements'.

A summary of applicable regulations are listed in this document for the benefit of persons in control of and working with 'exempt' pressure equipment.

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1 General

Under Australian Standard AS 3788, table 4.1 category 6, pressure vessels whether static or portable and characterised by Pressure (MPa) x Volume (L) equal to or less than 150 MPa L (for Air-receivers) are exempt from regulatory controls.

2 Owner's Responsibility

Current Occupational Health and Safety Legislation requires an owner to provide and maintain pressure equipment to ensure the safety and health of workers and other persons. The owner is therefore required to set up a maintenance and inspection program to be carried out by him or a competent person. Also, he is required to observe the manufacturer's instructions and/or Rail Infrastructure Corporation Technical Maintenance Plan to ensure safe operation of the pressure equipment.

The owner must ensure that regular in-house surveillance and examination is done while maintaining records of all activities related to the equipment.

This document is recommended for use as an inspection guide only. It is, ultimately, for the owner to set a more appropriate inspection period while ensuring his responsibilities and obligations under OH&S are met.

3 Repairs and Modifications

IMPORTANT: All repairs, modifications and serious damage to a pressure vessel shall be notified to **Workcover**. Workcover Authority must approve all repair procedures prior to commencing work on a pressure vessel.

4 Definitions

The following definitions are extracted wholly or in part from AS 3788.

Owner - includes a mortgagee, lessee, hirer, or borrower of the pressure equipment and a person who has control, charge or management of the pressure equipment.

Competent Person - a person suitably qualified, adequately trained, and appropriately experienced for the class or kind of work in which the person is engaged. He shall be involved in the overall inspection process and contributes to the integrity assessment of the pressure equipment and includes the Accredited Inspector. He may seek specialist advice and assistance as required to make mature judgement.

Accredited Inspector - a person accredited in writing, by the Inspecting Authority for the purpose of inspecting pressure equipment in accordance with AS 3788.

May - indicates that a statement is optional.

Shall - indicates that a statement is mandatory.

Should - indicates a recommendation.

5 Inspection

5.1 General

This section sets out recommended inspection requirements for 'Exempt' pressure equipment.

The objectives of the inspection are to promote the safety and health of persons at the workplace, to ensure that pressure equipment is safe and performs reliably and to comply with safety legislation.

5.2 Commissioning/Recommissioning and Initial Inspection.

Pressure equipment being placed in service for the first time, or following repair or modification, **shall** be inspected by an Accredited Inspector, in accordance with AS 3788, to ensure that the work is properly executed, well documented and the pressure equipment is safe to operate.

5.3 On-line Surveillance

This should be carried out at least **weekly** while the equipment is in use by the person responsible for the operation of the equipment and will normally consist of visual observation of the pressure equipment and lifting the hand easing gear on the safety valve to check for correct operation. This process acts as an early warning and helps to determine the condition of the vessel including supports, instruments, valves, pipework etc. Examples of things to look out for are abnormal noise and vibration from loose fittings or improper installation.

Any sign of deterioration shall be reported to the owner.

5.4 Periodic Inspection

All pressure equipment should be inspected by a competent person every **2 years** or less, depending on the use and history of the vessels, to ensure safe operation between inspection periods. Inspection **may** be both internal and

external and include ancillary equipment such as safety devices and pipework etc.

Details and results of the inspection shall be recorded and maintained for the duration of the equipment life (see appendices A and B for typical information to be kept). It is a statutory requirement to keep and maintain a current information file for each item of pressure equipment which the owner controls. The information may be kept on hard copy file or stored electronically.

5.5 Inspection Equipment

Aids to visual examination may be used to assist the person involved in the inspection process to make sound judgement. For example magnifying glass (up to 10x), torch light/lamp, mirror, tapes, rules and straight edges may be necessary to use during inspection.

5.6 Inspection Procedures

The most common and widely accepted form of in-service inspection is **Visual Examination**. This should be done at **2 yearly** intervals and **may** include internal and/or external inspection where practicable. The inspection shall be done by a competent person.

Its aim is to check for defects which occur in pressure equipment. Examples of defects which may occur are mechanical damage, blockage, leakage, corrosion/erosion, cracks, dents/bulges and weld defects.

It is not possible to write rules to cover all cases of in-service inspection. However each vessel (air only pressure vessels) should be inspected in accordance with the following guidelines.

The surface must be sufficiently clean to permit adequate examination.

5.6.1 External:

Check for cracks, bulges, dents, and corrosion (particularly underneath the vessel). Check entire weld surface and supports.

5.6.2 Internal:

Remove plugs or hand hole covers at the openings. Check the inside prior to any cleaning operation for the presence of scale deposits or dead spots. Such deposits indicate closer inspection is warranted.

Check all internal surfaces paying attention to the lower vessel surface, area adjacent to drain and openings for evidence of corrosion/erosion, pitting, cracking etc.

When replacing plugs or hand hole covers, new gaskets or appropriate sealing material should be used to ensure correct sealing is achieved.

5.6.3 Safety Valve:

For safety valves operating in clean service, service inspection and test may be done by a competent person in situ. This should be arranged **annually** but tests periods are not to exceed 5 years in accordance with AS 3788 clause 4.6.

In other cases the safety valves shall be removed and subjected to detailed inspection. The period of inspection will depend on the service conditions but is not to exceed 5 years.

In general, safety valves showing signs of mechanical damage, blockage or leakage are to be removed from service by a competent person then overhauled or replaced as required.

5.6.4 Pressure Gauge:

Should be in good working order. Damaged gauges, and gauges with suspect readings, are to be repaired in accordance with AS 1349, or replaced as required.

5.6.5 Drain Valve:

Drain **daily** where possible (or monthly if vessel is fitted with an auto drain valve).

Replace valve if blocked or hard to operate

NOTE: According to AS 1210 clause 3.2.4.2 pressure vessels liable to corrode are designed to include a corrosion allowance. Where corrosion is evident estimate the depth of corrosion or pitting. If less than or equal to 0.75mm the equipment may be kept in service if no other defects are detected.

IMPORTANT any fault found during the inspection, shall be referred to the owner who shall assess the information and seek advice or assistance from an accredited inspector accordingly.

6 Reference Documents

6.1 RIC Standards

6.2 Australian Standards

AS 1210 Unfired Pressure Vessels

AS 3788 Pressure Equipment – In Service Inspection

APPENDIX A
TYPICAL INFORMATION FILE
INITIAL INSPECTION

Vessel Description.....

Plant Number.....

Inspecting Authority Registration Number.....

Accredited Inspector (Licensed Boiler Inspector).....

Date Installed.....

Supplier/Manufacturer.....

Attachments **Manufacturers Data Report**..... Yes/No

Drawings..... Yes/No

Design PressureKpa **Design Temperature** C

Dimensions Length.....Mm **Diameter**Mm

VolumeLitres

Pressure X VolumeMpal

Contents

Hazard Level (Table B.1 AS 3920.1)

Equipment Category (Table 4.1 AS 3788)

Statutory Inspection Required Yes/No

Inspection Periodicity **Internal**Years

(As Agreed With The Accredited Inspector) **External**Years

Safety Devices

Note: For more complex vessel types refer to AS3788 Section 8

APPENDIX B

RAIL INFRASTRUCTURE CORPORATION

**RECORD OF INSPECTION/MAINTENANCE/MODIFICATION
OF EXEMPT PRESSURE VESSELS**

SRA No. _____ **Controller** _____

Location _____

CONDITION OF VESSEL AT INSPECTION

* **Note:** Satisfactory = sat Unsatisfactory = unsat

Shell and Ends:

Internal sat / unsat _____

External sat / unsat _____

Handholes, Plugholes sat / unsat _____

Mountings sat / unsat _____

Safety Valve sat / unsat _____

Pressure Gauge sat / unsat _____

Drain Valve sat / unsat _____

Any Repairs effected since last inspection: _____

Remarks: _____

Signature of Owner/Competent Person

____/____/____
Date