AS/NZS 3788:2006

Australian/New Zealand Standard™

# Pressure equipment—In-service inspection



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This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee ME-001, Pressure Equipment. It was approved on behalf of the Council of Standards Australia on 27 June 2006 and on behalf of the Council of Standards New Zealand on 7 July 2006.
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# RECONFIRMATION

# OF
# AS/NZS 3788:2006
# Pressure equipment—In-service inspection

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Technical Committee ME-001 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

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Australian/New Zealand Standard™

# Pressure equipment—In-service inspection

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# PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee ME-001, Pressure Equipment to supersede AS/NZS 3788:2001, *Pressure equipment—In-service inspection*.

The objective of the revision is to align the Standard with current equipment integrity management and assessment practices and to address some of the problems currently experienced in industry. To achieve this, the Standard has been significantly revised throughout.

While the Standard still sets out minimum inspection intervals, it now allows those intervals to be varied in response to a thorough risk-based engineering assessment. This is intended to allow the efficient use of integrity management programs by large-scale industry. As such assessments require significant resources to consider all the relevant factors, it is expected that the majority of the users of this Standard will continue using the prescribed intervals. It should be noted that the previous Clause 4.4.4.3(c), Further extended period, has been removed to ensure that variations to inspection intervals are properly assessed.

More emphasis has been placed on the responsibility to use competent bodies and personnel for all aspects of the inspection and assessment processes—a reflection of the current philosophy of occupational health and safety regulations. Guidance material is included to aid industry in assessing the competence of bodies and people for different tasks.

The Committee noted that poorly-marked or unidentifiable equipment is a significant issue facing inspectors, and has provided some guidance on dealing with such situations.

The appendices have also been revised, including a review of the normative or informative status of each. Appendix O (regarding fracture mechanics) has been significantly revised. A new appendix has been added regarding the inspection of support structures.

This Standard provides inspection requirements to assist in assuring the continued safe operation of pressure equipment. In some circumstances additional inspection may be necessary for adequate performance or safety. The material contained in this Standard may be used as an aid in the training of inspection personnel.

Users of this Standard are reminded that it has no legal authority in its own right, but acquires legal standing where adopted by government or other authority having jurisdiction, or if specified as part of a commercial contract.

Statements expressed in mandatory terms in notes to tables and figures are deemed to be requirements of this Standard.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

# Australian/New Zealand Standard
# Pressure equipment—In-service inspection

## S E C T I O N 1 S C O P E A N D G E N E R A L

### 1.1 SCOPE

This Standard specifies the minimum requirements for the inspection, repair and alteration of in-service boilers, pressure vessels, piping, safety equipment, and associated safety controls (hereafter referred to as pressure equipment), and gives guidance in the execution of such activities. Guidance is included for the inspection of ancillary equipment such as structures. This Standard also specifies the requirements for the initial inspection after installation and prior to commissioning. The inspection flow diagram (see Figure 1.1) illustrates the various types of inspection covered by this Standard.

This Standard provides information to facilitate grounds for agreement between interested parties, and the establishment of uniform minimum requirements for in-service inspections, including inspection intervals and procedures, to assist in assuring safe and economic operation. Information is provided on mechanisms of deterioration, the assessment of defects, and the assessment of fitness for service of pressure equipment.

No rules can be written in sufficient detail to cover all aspects of the inspection of in-service pressure equipment. The owner is responsible for ensuring that the extent and frequency of inspection is appropriate and adequate for the continued safe operation of the pressure equipment. This may require the seeking of expert advice.

Duty of Care is now prescribed by Occupational Health and Safety Legislation. This Standard does not supersede such Duty of Care, but is intended to complement and contribute to it.

### 1.2 APPLICATION

This Standard applies to, but is not limited to, pressure equipment covered by AS/NZS 1200. Typically it includes the following:

(a) Boilers and associated pressure parts, controls and pipe work covered by AS 1228, BS 1113, BS 2790, AS 2593 and ASME BPV-I.

(b) Pressure vessels and associated pressure parts, controls and pipe work covered by AS 1210, BS PD 5500, EN 13445, ASME BPV-VIII, AS 2971 (serially produced pressure vessels) and EN 286-1.

(c) Pressure piping covered by AS 4041, NZS/BS 806, ASME B 31.1 and ASME B 31.3.

(d) Pressurized storage tanks built to API 620 or equivalent.

(e) Fired heaters.

(f) Heritage boilers and pressure vessels.

Although pressure equipment with Hazard Level E (to AS 4343) is within the scope of this Standard, no specific requirements have been included. To ensure safety, in-service inspection of such equipment should follow the principles of this Standard, along with good engineering practice.

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This Standard does not specifically deal with the following equipment, but provides information which may be used as guidance.

(i) Storage tanks covered by AS 1940 and built to API 650, AS 1692 or equivalent (refer API 653).

(ii) Miniature boilers to the AMBSC codes.

(iii) Pressurized machines, e.g. turbines, compressors, etc.

(iv) Pipelines as per AS 2885 or equivalent.

## 1.3 REFERENCED AND RELATED DOCUMENTS

### 1.3.1 Referenced documents

A list of the documents referred to in this Standard is given in Appendix A.

NOTE:Where reference is made to a Standard by its number only, the reference applies to the current edition of the Standard including any amendments. Where reference is made to a Standard by number, year and, where relevant, an amendment number, the reference applies to that specific document.

### 1.3.2 Related documents

Related documents and guidance references are listed in Appendix A.

## 1.4 DEFINITIONS

For the purposes of this Standard, the definitions given in AS 4942 and the following apply.

NOTE: Definitions for terms such as ‘owner’, ‘competent person’ and ‘inspector’ may differ slightly from State OHS regulations or codes of practice.

For calculations and reports AS ISO 1000, the International System of Units, shall be applied.

### 1.4.1 Inspector

A person able to inspect pressure equipment for the purpose of establishing conformity with the specified requirements.

### 1.4.2 Inspection body

A body corporate, firm or person external to that of the owner, or an owner’s inspection department, able to provide the inspection services of pressure equipment.

### 1.4.3 Competent person

A person who, due to their knowledge and skills, is acceptable to the owner/user/responsible person to perform a required task. The appropriate knowledge and skills may be acquired through training, experience, qualifications, or some combination of these.

NOTES:

1 The term ‘competent person’ is used in this Standard to address a variety of technical requirements. Guidance on competency requirements is provided in Appendix V.

2 In New Zealand the ‘competent person’ for inspection activities is the ‘inspector’ or ‘design verifier’.

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### 1.4.4 Inspection

Activities such as viewing, measuring, examining, testing, gauging, calculating, checking, verifying one or more characteristics of a product design, material, manufacture, product, service, process, plant or reports and determination of their conformity with specific requirements or, on the basis of professional judgement, with general requirements.

NOTES:

1 The above activities may require multiple parties.

2 For inspection the 'competent person' should be the 'in-service inspector' or a person with equivalent qualifications and experience.

### 1.4.5 Surveillance

Activities which observe the general condition of equipment, including on-line inspection, monitoring, planned or un-planned condition audits, etc.

### 1.4.6 Pressure equipment and ancillaries

Equipment as defined in Clause 1.2, including boilers, pressure vessels, pressure piping, and pressurized storage tanks.

In New Zealand, the regulations also include certain fired heaters, hot water boilers, gas and steam turbines, steam engines, pumps and compressors. See AS/NZS 1200.

Pressure equipment also includes ancillaries such as interconnected parts and components, valves, gauges and other fittings, headers, bolting, gaskets, supports and pressure-retaining accessories. Unless noted, it does not normally include items such as pumps, fans, and similar machinery.

### 1.4.7 Owner/User/Responsible person

A body corporate, firm or person who has right of title to, or management of, or control over, pressure equipment. This includes a person exercising such management or control as an agent of the owner and the user, operator and controller, as appropriate.

Where these are different parties, the owner is responsible for clarifying the respective roles, and is responsible to ensure overall compliance with this Standard.

NOTE: Control is taken to encompass the operational life cycle, ie. operation, inspection and testing, repair and alteration, maintenance, re-rating, mothballing or preservation, decommissioning and abandonment.

### 1.4.8 Defects

Imperfections, damage, deterioration or deficiencies in pressure equipment.

NOTE: The presence of a defect in pressure equipment does not necessarily imply that the equipment is unfit for service (see Clause 5.2).

### 1.4.9 In-service

The period during the life of pressure equipment from the beginning of commissioning until disposal.

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