Australian/New Zealand Standard™

Pressure equipment—
In-service inspection

AS/NZS 3788:2001
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 16 July 2001 and on behalf of the Council of Standards New Zealand on 1 August 2001. It was published on 14 September 2001.

The following interests are represented on Committee ME-001:

A.C.T. WorkCover
Australasian Corrosion Association
Australasian Institute of Engineer Surveyors
Australian Aluminium Council
Australian Building Codes Board
Australian Chamber of Commerce and Industry
Australian Industry Group
Australian Institute of Energy
Australian Institute of Petroleum
Australian Liquefied Petroleum Gas Association
Boilers and Pressure Vessel Manufacturers Association of Australia
Bureau of Steel Manufacturers of Australia
Department for Administrative and Information Services, S.A.
Department of Employment, Training and Industrial Relations, Qld
Department of Infrastructure, Energy and Resources, Tas.
Department of Labour, New Zealand
Electricity Engineers Association, New Zealand
Electricity Supply Association of Australia
Institute of Materials Engineering Australasia
Institution of Engineers, Australia
Institution of Professional Engineers, New Zealand
National Association of Testing Authorities, Australia
New Zealand Engineering Federation
New Zealand Heavy Engineering Research Association
New Zealand Institute of Welding
New Zealand Petrochemical Users Group
Victorian WorkCover Authority
Welding Technology Institute of Australia
WorkCover N.S.W.
WorkSafe W.A.

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Australia web site at www.standards.com.au or Standards New Zealand web site at www.standards.co.nz and looking up the relevant Standard in the on-line catalogue.

Alternatively, both organizations publish an annual printed Catalogue with full details of all current Standards. For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia International or Standards New Zealand at the address shown on the back cover.

This Standard was issued in draft form for comment as DR 00062.
PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee ME-001, Pressure Equipment to supersede AS/NZS 3788:1996, Pressure equipment—In-service inspection.

This Standard has been developed on a consensus basis.

Consensus means general agreement by all interested parties. Consensus includes an attempt to remove all objections and implies much more than the concept of a simple majority, but not necessarily unanimity. It is consistent with this meaning that a member may be included in the Committee list and yet not be in full agreement with all clauses of this Standard.

The Committee recognized there was a need to give guidance to users, inspectors and regulatory authorities on the inspection of in-service pressure equipment.

This Standard provides inspection requirements to assist in assuring the continued safe operation of the pressure equipment. In special circumstances additional requirements may be necessary for adequate performance or safety. The material contained in this Standard will be a valuable aid in the training of inspectors.

Changes since the last edition include the following:

(a) Removal of regulatory requirements for Australia only. In New Zealand the HSE (Pressure Equipment, Cranes and Passenger Ropeways) Regulations 1999 are to be referred to, since they take precedence over the Standard requirements.

(b) Details of the in-service inspector requirements and responsibilities.

(c) Details of risk based inspection.

(d) Inclusion of new Appendices to cover:

(i) Risk management.
(ii) In-service inspection and record keeping for steam locomotive and traction engine boilers.

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.

During the preparation of this Standard, reference was made to the following publications:


API Guide to inspection of refinery equipment.


ROSPA—1975 Registration and periodic inspection of pressure vessels (Published by Imperial Chemical Industries Ltd).

Acknowledgment is made of the assistance obtained from these publications.

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.
CONTENTS

SECTION 1 SCOPE AND GENERAL
1.1 SCOPE....................................................................................................................... .. 5
1.2 APPLICATION ........................................................................................................... 5
1.3 REFERENCED AND RELATED DOCUMENTS....................................................... 7
1.4 DEFINITIONS............................................................................................................. 7
1.5 RISK MANAGEMENT AND RISK BASED INSPECTION ...................................... 7
1.6 SAFETY ...................................................................................................................... 7
1.7 METHODS OF INSPECTION .................................................................................... 7
1.8 SPECIAL CONDITIONS AND VARIATIONS .......................................................... 8
1.9 ALTERNATIVE STANDARDS.................................................................................. 8

SECTION 2 BASIC FEATURES OF INSPECTION
2.1 OBJECTIVES OF INSPECTION ................................................................................ 9
2.2 ELEMENTS OF INSPECTION................................................................................... 9
2.3 STAGES OF INSPECTION......................................................................................... 9
2.4 INSPECTION PROCESS ........................................................................................ 10

SECTION 3 INSPECTION PERSONNEL AND ADMINISTRATION
3.1 OWNER’S RESPONSIBILITIES.............................................................................. 12
3.2 IN-SERVICE INSPECTOR’S RESPONSIBILITIES AND CAPABILITIES ............ 12
3.3 OWNER INSPECTION SYSTEM............................................................................. 13
3.4 SUPPORT ORGANIZATIONS ................................................................................. 14

SECTION 4 PRESSURE EQUIPMENT INSPECTION
4.1 GENERAL................................................................................................................. 15
4.2 COMMISSIONING OR RECOMMISSIONING INSPECTION................................ 15
4.3 OPERATING SURVEILLANCE .............................................................................. 15
4.4 PERIODIC INSPECTION ......................................................................................... 16
4.5 INSPECTION OF IDLE PRESSURE EQUIPMENT................................................. 26
4.6 PRESSURE-RELIEF DEVICES................................................................................ 27
4.7 CONTROLS CRITICAL FOR SAFEGUARDING EQUIPMENT ............................ 30
4.8 INSTRUMENTATION AND CONTROLS............................................................... 30
4.9 EMERGENCY SHUTDOWN SYSTEMS ................................................................. 30
4.10 AUTOMATIC FIREFIGHTING SYSTEMS USED TO PROTECT PRESSURE
    EQUIPMENT ............................................................................................................ 31
4.11 LOW TEMPERATURE VESSELS ........................................................................... 31

SECTION 5 ASSESSMENT OF PRESSURE EQUIPMENT INTEGRITY
5.1 GENERAL................................................................................................................. 32
5.2 ACCEPTANCE CRITERIA OF DEFECTS............................................................... 32
5.3 DETERMINATION OF REMAINING LIFE ................................................................ 36
5.4 DETERMINATION OF MAXIMUM ALLOWABLE WORKING PRESSURE ....... 40
5.5 RELATED DOCUMENTS........................................................................................ 41

SECTION 6 REPAIRS, ALTERATIONS AND RE-RATING
6.1 GENERAL................................................................................................................. 42
6.2 REPAIRS, REPLACEMENTS AND ALTERATIONS .............................................. 42
6.3 RE-RATING ............................................................................................................. 43