AS/NZS 4645.1:2018

Australian/New Zealand Standard™

Gas distribution networks

Part 1: Network management

STANDARDS Australia

STANDARDS NEW ZEALAND PAEREWA AOTEAROA

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Energy Networks Australia
Engineers Australia
Gas Association of New Zealand
Gas Energy Australia
Gas Technical Regulators Committee
International Copper Association Australia
LPG Association of New Zealand
New Zealand Institute of Gas Engineers
Plastics Industry Pipe Association of Australia
Plastics New Zealand
Welding Technology Institute of Australia
Worksafe New Zealand—Energy Safety

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee AG-008, Gas Distribution, to supersede AS/NZS 4645.1:2008.

The objective of this Standard is to provide for the protection of the general public, gas distribution network operating personnel and the environment. It also ensures the operation of a safe, reliable and sustainable gas distribution network that reticulates gas to consumers.

The AS/NZS 4645 series of Standards comprises the following parts:

AS/NZS
4645.1 Part 1: Network management (this Standard)
4645.2 Part 2: Steel pipe systems
4645.3 Part 3: Plastics pipe systems

These Standards adopt a performance-based approach for gas distribution network management. A performance-based (rather than prescriptive) approach recognizes that one particular standard or way of doing things may not be the best fit for all situations in all gas distribution networks. A performance-based approach allows innovation and development in the way gas distribution networks are managed, operated and maintained. A performance-based standard aims to specify safety outcomes while allowing some flexibility on how these outcomes are delivered.

The AS/NZS 4645 series of Standards—

(a) provides performance-based requirements for gas distribution network safety, defining important principles during the lifecycle of gas distribution networks;

(b) provides prescriptive (deemed to conform) means of conformance in support of some of those performance-based requirements; and

(c) allows for alternative means of conformance that may be also acceptable provided the required safety outcomes can be demonstrated.

This Standard covers the design, construction, commissioning, operation, maintenance and decommissioning of gas distribution networks and provides a performance-based framework for their management. This Standard identifies the high-level safety requirements for all stages in the life-cycle of a gas distribution network.

In this Standard, the terms 'means of conformance' and 'a means of conformance' have been used to indicate an appropriate mechanism or mechanisms that can be used for achieving an acceptable level of risk. These terms are equivalent to the terms 'means of compliance' and 'a means of compliance' as used in the 2008 edition of the Standard. Where the Standard is referenced in legislation in all Australian and New Zealand jurisdictions conformance with this Standard may imply compliance with the regulations.

AS/NZS 4645.2 and AS/NZS 4645.3 set out means of conformance for elements of design, material, construction, testing, commissioning and decommissioning of steel and plastics mains and services within a gas distribution network. The means of conformance for other elements of a gas distribution network are documented in this Standard. Conformance to the requirements of this Standard, other than that outlined in the means of conformance can be achieved through the processes described in this Standard.

This Standard can be used as a stand-alone document whereas AS/NZS 4645.2 and AS/NZS 4645.3 are to be used in conjunction with this Standard.

This Standard takes a risk management approach in accordance with AS/NZS ISO 31000, *Risk management—Principles and guidelines*. Risks associated with the gas distribution network are required to be at acceptable levels with respect to any loss of supply of gas and any threats from escaping gas, throughout the life of the gas distribution network. Safety and Operating Plans are used to ensure that all risks associated with the design operation and maintenance of a gas distribution network are identified and appropriately managed.

This Standard is not a design handbook, nor a manual on distribution practices. It does not remove the need for qualified and experienced engineering design, installation and operation or for competent engineering judgment, and does require interpretation and implementation by competent engineers.

The Australian and New Zealand Technical Regulators have advised that this Standard will apply to the lifecycle of new gas distribution networks and modifications or augmentations to existing assets within gas distribution networks. However, the Sections on operations, maintenance, repair, decommissioning, gas quality and risk assessment may be suitable for application to existing assets in existing gas distribution networks.

Statements expressed in mandatory terms in notes to 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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FOREWORD

This Standard achieves its purpose through six fundamental principles as follows:

(a) A gas distribution network is designed and constructed to have sufficient controls to withstand the threats to which it may be subjected during its lifecycle.

(b) Before a gas distribution network is placed into operation it is inspected and tested to prove its integrity.

(c) Important matters relating to safety, engineering design, materials, testing and inspection are reviewed, documented, recorded and approved in accordance with the Safety and Operating Plan (SAOP) framework.

(d) Operations and maintenance provide for continued monitoring and safe operation of the gas distribution network.

(e) Where changes occur in or to a gas distribution network, which alter the design assumptions or affect the original integrity, appropriate steps are taken to assess the changes, to ensure continued safe, reliable and sustainable operation of the gas distribution network.

(f) Where a means of conformance alternative to that provided in this Standard is to be adopted, a review is undertaken to determine that the alternative is within an acceptable level of risk.

Where this Standard does not provide detailed requirements appropriate to a specific item, the fundamental principles set out above and the principles and guidelines set out in this Standard are the basis on which an engineering assessment is to be made.

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard
Gas distribution networks

Part 1: Network management

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies the requirements for safe, reliable and sustainable management of gas distribution networks operating at less than or equal to 1050 kPa that reticulate gas to consumers.

Appendix A lists the additional requirements for elements of a gas distribution network with a MAOP greater than 1050 kPa as allowed in New Zealand and by legislation in some states of Australia.

The requirements apply to the lifecycle of new gas distribution networks or new assets introduced where existing gas distribution networks are modified or augmented. The Sections on operations, maintenance, repair, decommissioning, gas quality and risk assessment may be suitable for application to existing assets in existing gas distribution networks.

Gas distribution networks within the Scope of this Standard comprise all facilities between—

(a) the outlets of all city gates, supply points or their equivalent or for an LP Gas distribution network, the point of exit of the LP Gas feeder plant; and

(b) the outlet of the consumer's meter assemblies,

as detailed in Figure 1.1.