AS 1697—1981

Australian Standard®

SAA Gas Pipeline Code

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The following scientific, industrial and governmental organizations and departments were officially represented on the committee entrusted with the preparation of this standard:

Australasian Corrosion Association
Australasian Institute of Mining and Metallurgy
Australian Gas Association
Australian Institute for Non-destructive Testing
Australian Institute of Energy
Australian Institute of Petroleum
Australian Liquefied Petroleum Gas Association
Australian Petroleum Exploration Association
Australian Pipelines Industry Association
Australian Welding Institute
Australian Welding Research Association
Bureau of Steel Manufacturers of Australia
Department of Industrial Relations, N.S.W.
Department of Minerals and Energy, Victoria
Department of Mines and Energy, S.A.
Department of Mines, Queensland
Department of Mines, W.A.
Energy Authority of New South Wales
Institution of Engineers, Australia
Institute of Petroleum, U.K.
Metal Trades Industry Association of Australia
National Association of Australian State Road Authorities
New South Wales Institute of Technology
Pipeline Authority
Pipelines Authority of South Australia
Railways of Australia Committee
Snowy Mountains Engineering Corporation

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Gas Transmission and Distribution Systems

known as the

SAA Gas Pipeline Code

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PREFACE

This edition of this standard was prepared by the Association's Committee on Gas and Liquid Petroleum Piping Systems. This edition includes an additional section, i.e. Section 12—Corrosion Mitigation, which replaces and expands previous requirements which were specified in Clause 3.4. Related Clauses 2.9 and 2.10 covering material requirements have also been revised and further minor changes, including editorial updating, have been made. The items which have been revised in this edition are listed in the 'Annex' following the Index. It should be noted that Appendix F to the 1975 edition was deleted by Amendment No 3, but the original references to the other Appendices have been retained in order to facilitate reference to them.

The purpose of this standard is to provide guidance on safety requirements for design, construction, operation and maintenance of gas transmission and distribution systems.

The standard sets out requirements for good engineering practice based on known experience and on appropriate existing standards, both Australian and overseas. In its preparation close attention was given to the American National Standard Code for Pressure Piping—Gas Transmission and Distribution Piping Systems, ANSI B3 1.8—the Canadian Standard for Gas Transmission and Distribution Systems, CSA Z184; the Institution of Gas Engineers Recommendations on Transmission and Distribution Practice; the Institute of Petroleum Model Code of Safe Practice, Part VI—Petroleum Pipelines, and Part VIII—Pipeline Operations in Marine Areas; the Department of Transportation—Office of Pipeline Safety, U.S.A., Federal Register Vol. 35, No 161, Part II—Transporting of Natural and Other Gas by Pipeline; the American Petroleum Institute Codes, particularly API 1104 and other standards. Due acknowledgment is made of the assistance provided by these sources.

Although safety is the basic consideration of this standard other requirements will also control the specifications for any pipeline and these must be considered. The standard is not a design handbook and, although certain sections contain specific requirements, it does not replace the need for appropriate experience and competent engineering judgement. Fundamental engineering principles should be followed, and materials or practices not specifically approved or prohibited in this standard should be qualified for use as described in the applicable sections.

Attention is drawn to the requirements of both Commonwealth and State legislation and to guides and codes issued by statutory authorities and local government bodies pertaining to pipelines; and this standard should be regarded as complementary to such requirements where these are applicable.

The standard does not deal with, and is not intended to supplant, any matter of personnel safety with respect to work practices or such matters as the safe use of equipment and machinery in construction, which may be required by law or which are current industrial practice.

In relation to materials and components, this standard makes reference to a wide range of Australian, British and American standards. Many of these standards require the reporting of results of tests. Such reporting should be in the form of approved test certificates. Listings of relevant standards are given in Appendices A and B.

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* See statement in Preface regarding Appendix F.

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard for GAS TRANSMISSION AND DISTRIBUTION SYSTEMS

SECTION 1. SCOPE AND GENERAL REQUIREMENTS

1.1 SCOPE. This standard sets out minimum safety requirements and makes recommendations for the design, fabrication, installation, inspection, testing, operation and maintenance of gas transmission and distribution systems in which the pipes are manufactured from steel, cast iron, copper and plastics (UPVC and PE), and qualify for use in terms of the relevant Section herein. This includes dual phase flow in natural gas pipelines.

Gas transmission and distribution systems within the scope of this standard comprise all pipelines, mains and gas service pipes up to the consumer's meter inlet within the limits defined by Fig. 1.1. This standard also covers the conditions of use of elements of these piping systems, including but not limited to pipe, fittings, flanges, bolting, gaskets, regulators, pressure vessels, pulsation dampers and pressure-relief devices.

This standard does not apply to the following:

(a) Design and fabrication of pressure vessels covered by AS 1210 or other approved pressure vessel codes; or to LP gas installations covered by AS 1596.
(b) Pipe or bottle type holders or containers.
(c) Piping beyond the consumer's meter inlet which is governed by the gas supply authority's installation rules.
(d) Petroleum processing plants, gas manufacturing plants, industrial plants or mines.
(e) Vent piping to operate at substantially atmospheric pressure for waste gas of any kind.
(f) Well-head assemblies, including control valves, and flow lines between well-head and trap or separator, or casing and tubing in gas or oil wells.
(g) Manufacture of proprietary items of equipment, apparatus or instruments.
(h) Petroleum and other liquid transportation piping systems or liquid slurry lines.

It is also not intended that this standard be applied retroactively to existing installations in so far as design, fabrication, installation and testing at the time of construction are concerned. Further it is not intended that this standard be applied retroactively to established operating pressures of existing installations except as provided for in Section 11.

However, provisions of this standard apply to operating and maintenance procedures of existing installations, and to existing installations when they are modified to operate under conditions within the scope of this standard.

1.2 SAFETY. The requirements and recommendations of this standard are considered to be adequate to ensure the safety of the general public and all persons engaged in pipeline construction and operation, under conditions usually encountered in gas transmission and distribution systems to the extent that safety is affected by —

(a) basic design;
(b) quality of materials and workmanship;
(c) testing requirements; and
(d) maintenance and operation.

Extra protection should be provided where necessary, particularly to prevent damage from unusual conditions such as may arise at road, rail or river crossings, bridges, areas of heavy traffic, long self-supported spans, from vibration, weight of special attachments or the possibility of ground subsidence or any other abnormal forces.

Existing industrial safety regulations pertaining to work areas, safety devices and safe work practices are not supplanted by this standard.

1.3 CLASSIFICATION OF GAS TRANSMISSION AND DISTRIBUTION SYSTEMS.

1.3.1 Division 1 Systems. A gas pipeline, main or service having —

(a) a hoop stress level equal to or greater than 0.2 (see Clause 1.3.4 for the determination of hoop stress level); or

(b) a maximum operating pressure greater than 1050 kPa;

is classified as a Division 1 system.

1.3.2 Division 2 Systems. A gas pipeline, main or service having —

(a) a hoop stress level less than 0.2 (see Clause 1.3.4 for determination of hoop stress level); and

(b) a maximum operating pressure of 1050 kPa or less;

is classified as a Division 2 system.

A gas pipeline, main or service manufactured from cast-iron, copper, unplasticized polyvinyl chloride (UPVC) or polyethylene (PE) is classified as a Division 2 system.

1.3.3 Pressure Classification with Division 2 Systems.

1.3.3.1 *Low pressure.* Low pressure means a gas pressure equal to or less than 7 kPa.

1.3.3.2 *Medium pressure.* Medium pressure means a gas pressure exceeding 7 kPa but not exceeding 200 kPa.

1.3.3.3 *High pressure.* High pressure means a gas pressure exceeding 200 kPa.