Amendment 1 - December 1988
" 2 - March 1989

Standards
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Australia

Australian Standard®
2941—1987

FIXED FIRE PROTECTION INSTALLATION— PUMPSET SYSTEMS

This Australian Standard was prepared by Committee FP/8, Fire Service Pumps. It was approved on behalf of the Council of the Standards Association of Australia on 27 June 1987 and published on 2 November 1987.

The following interests are represented on Committee FP/8:

Association of Consulting Engineers Australia

Association of Hydraulic Services Consultants Australia

Australian Institute of Petroleum Ltd

Australian Pump Manufacturers Association Ltd

Commonwealth Fire Board

Confederation of Australian Industry

Firefighting authorities

Fire Protection Industry Association of Australia Ltd

Insurance Council of Australia Ltd

Metropolitan Water Sewerage and Drainage Board, N.S.W.

Railways of Australia Committee

This Standard was issued in draft form for comment as DR 85016.

STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

AMENDMENT No 1
to
AS 2941—1987
FIXED FIRE PROTECTION INSTALLATIONS—PUMPSET SYSTEMS

REVISED TEXT

The 1987 edition of AS 2941 is amended as follows; the amendment(s) should be inserted in the appropriate place.

SUMMARY: This Amendment applies to Clauses 1.4.11, 2.5.1, 3.1.1, 3.1.2, 3.1.3, 3.8.1, 3.8.2, 7.1.3, 8.3.9.1, 8.3.9.2, 8.3.9.5, and 8.3.9.6, and to Paragraphs A3 and E1.

Published on 12 December 1988.

STANDARDS AUSTRALIA

AMENDMENT No 2
to
AS 2941—1987
FIXED FIRE PROTECTION INSTALLATIONS—PUMPSET SYSTEMS

REVISED TEXT

The 1987 edition of AS 2941 which was amended in December 1988 is further amended as follows; the amendment (s) should be inserted in the appropriate place.

SUMMARY: This Amendment applies to Clause 8.3.2.

Published on 13 March 1989.

AUSTRALIAN STANDARD

FIXED FIRE PROTECTION INSTALLATION— PUMPSET SYSTEMS

AS 2941—1987

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PREFACE

This Standard was prepared by the Association's Committee on Fire Service Pumps.

The purpose of this Standard is to provide a reasonable degree of protection for life and property from fire through installation requirements for fire pumpsets based upon sound engineering principles, test data, and field experience. It is intended that this Standard supersedes general fire protection pumpset requirements contained in related SAA fire protection Standards.

Although the provision of a pump house is not required by this Standard, the committee has considered the fire pumpset and its ancillary equipment as being ideally located in a pump house.

Requirements are established for the selection, installation, and operation of fire pumps, pump drivers, and associated equipment. However, the Standard does not consider the number, disposition, or types of driver considered appropriate for a given fixed fire protection system. The term 'driver' is used in lieu of the term 'engine'.

The committee intends this Standard to promote greater reliability of fire pumpsets, particularly automatic starting variants, through improved shop and commissioning test requirements. However, the committee does not consider the initiation of the starting sequence outside the pump house within the scope of this Standard. Instead it has considered the processing of signals entering the pump house.

The Standard provides minimum performance requirements for pumpsets including motors, engines, fire pump controllers, batteries, and related ancillary equipment. The Standard requires that pumpsets be shop tested as an assembly, i.e. the pump driver and fire pump controller are to be checked as a working combination (and appropriate test certification issued) prior to despatch from the pumpset assembler's works. Further testing is required following final installation on site, and the Standard requires the incorporation of a flow and measuring device at each pumpset, unless provided elsewhere, to facilitate commissioning and subsequent periodic check testing.

The Standard requires that as an integral part of each fire pump installation a pressure relief device of the modulating type be fitted on the discharge side of the pump with the express purpose of protecting the pump during prolonged operation at or near the pump shut-off head as such an operating condition can generate excess heat or result in mechanical damage.

Of the internal combustion drivers, the compression-ignition (diesel) driver has proved to be the most dependable for driving pumps. It is proposed that except for installations made prior to the publication of this Standard, spark-ignition internal combustion drivers should not be used.

Maintenance requirements for fire pumps will be included in a part of AS 1851, Maintenance of Fire Protection Equipment.

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AMDT No 1 DEC. 1988

Page 5. Clause 1.4.11.

Insert the following new definition:

'**Nominal size (DN)**—a numerical designation of size which is common to all components in a piping system other than components designated by outside diameters or by thread size. It is a convenient round number for reference purposes and is only loosely related to manufacturing dimensions.

NOTE: The nominal size is designated by DN followed by a number. The nominal size DN cannot be subject to measurement and shall not be used for the purposes of calculation. It should be noted that not all piping components are designated by nominal size, for example steel tubes are designated and ordered by outside diameter and thickness.'

Renumber the existing Clause 1.4.11 and subsequent clause numbers.

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
FIXED FIRE PROTECTION INSTALLATIONS—PUMPSET SYSTEMS

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This Standard specifies requirements for pumpset systems for use with fixed fire protection installations such as sprinkler, hydrant, water spray, and hose reel systems. It includes certain requirements for water supplies and specific requirements for pumps, drivers, fire pump controllers, and auxiliary equipment. Requirements for installation and acceptance testing are also included. Requirements have also been provided for steam, electrical, compression-ignition, and turbine drivers.

It is recognized that there are some special fire pump installations, e.g. petrochemical and petroleum plants and small rural installations, which may require variations from the requirements of this Standard.

1.2 APPLICATION. Pumpset systems shall comply with the relevant sections of this Standard as follows:

(a) Water supplies ..... Section 2.

(b) Pumpsets ..... Section 3.

(c) Pumps ..... Section 4, Section 5, or Section 6, as appropriate.

(d) Drivers and fire pump controllers ... Section 7 or Section 8, as appropriate.

(e) Steam turbine drivers ..... Section 9.

(f) Proving tests for pumpsets ..... Section 10.

(g) Installation of pumpsets ..... Section 11.

(h) Acceptance tests for pumpset installations .... Section 12.

However, the Regulatory Authority may authorize certain variations to this Standard to accommodate special field situations, e.g. petrochemical and petroleum plants or small rural installations.

1.3 REFERENCED DOCUMENTS. A list with titles of the documents referred to in this Standard is given in Appendix G.

1.4 DEFINITIONS. For the purposes of this Standard, the following definitions apply:

1.4.1 Approved and approval—approved by, or the approval of, the Regulatory Authority.

1.4.2 Controller—the cabinet, motor starter, isolating switch, and other control devices for the control of electric motor driven pumpsets or compression-ignition internal combustion engine driven pumpsets.

1.4.3 Discharge head (assembly)—a part of the vertical line shaft pump assembly which supports the driver, pump, and column, aligns the driver and pump, and changes the vertical flow to a horizontal direction.

1.4.4 Driver—an engine, motor or turbine used to directly drive a fire pump.

1.4.5 Dynamic shaft deflection—the distance by which the axial centreline of the shaft deviates from the axial centreline of the bearings under dynamic conditions.

1.4.6 Efficiency (of a pump)—the ratio of the energy delivered by the pump to the energy supplied to the pump shaft, i.e. liquid power divided by applied power.

1.4.7 Hollow shaft—the hollow drive shaft of electric motors or right-angle gear drives. The hollow drive shaft is designed to accept the solid shaft of the pump. This design facilitates impeller adjustment within the bowl assembly and the installation of a non-reverse ratchet in the motor or gear drive.

1.4.8 Inertia base—a supporting base, isolated from the main structure, that increases the mass of the non-rotating parts to dampen any vibratory forces due to rotation.

1.4.9 Maximum allowable casing working pressure—the maximum working pressure for which a pump casing is designed.

1.4.10 Net positive suction head (of a pump) (NPSH)—the total inlet head plus the head corresponding to the atmospheric pressure minus the head corresponding to the vapour pressure. It, as well as inlet total head, is referred to the reference plane.

(a) *Required net positive suction head (NPSHR)*—a function of pump design which is available from the pump manufacturer.

(b) *Available net positive suction head (NPSHA)*—a function of the system in which the pump operates which can be calculated for any installation.

1.4.11 nominal size (DN) ... > SEE AMENDMENT 1

1.4.11 12 Non-reverse ratchet—a mechanism installed to prevent reverse rotation of the pump/driver assembly.

1.4.12 13 Oil-lubricated vertical turbine pump—a vertical turbine pump in which the vertical line shaft is enclosed and the shaft bearings are lubricated with oil.

1.4.13 14 Pumpset—an assembly comprising a pump, driver, and ancillary components on a common mounting together with an integral or separate fire pump controller.

1.4.14 15 Rate of flow—the flow requirement of the fixed fire protection system or relief valve or circulation relief valve. (See Appendix E.)

1.4.15 16 Rated flow (of a pump)—the rate at which water is delivered at rated pressure.

NOTE: Rated flow is expressed in litres per second.

1.4.16 17 Rated pressure (of a pump)—the pressure corrected for relative density developed by the pump when operating at rated flow. (See Appendix E.)