

AS 2885.3:2022



STANDARDS
Australia



Pipelines — Gas and liquid petroleum

Part 3: Operation and maintenance



AS 2885.3:2022

This Australian Standard® was prepared by ME-038, Petroleum Pipelines. It was approved on behalf of the Council of Standards Australia on 2 September 2022.

This Standard was published on 9 September 2022.

The following are represented on Committee ME-038:

- APGA Research and Standards Committee
- Australasian Corrosion Association
- Australian Institute of Petroleum
- Australian Petroleum Production and Exploration Association
- Australian Pipelines and Gas Association
- Department for Energy and Mining, SA
- Department of Industry, Tourism and Trade, NT
- Department of Mines, Industry Regulation and Safety, WA
- Energy Networks Australia
- Energy Safe Victoria
- Office of Energy and Climate Change — NSW Treasury
- Resource Safety & Health Queensland
- Weld Australia

Additional Interests

- Gas Association of New Zealand
- New Zealand Institution of Gas Engineers
- WorkSafe New Zealand

This Standard was issued in draft form for comment as DR AS 2885.3:2020.

Keeping Standards up-to-date

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:

www.standards.org.au

ISBN 978 1 76113 921 5

Pipelines — Gas and liquid petroleum

Part 3: Operation and maintenance

Originated in part as AS CB28—1972.
Revised and redesignated in part as AS 2885.3—1997.
Second edition 2001.
Third edition 2012.
Fourth edition 2022.

© Standards Australia Limited 2022

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth).

Preface

This Standard was prepared by the Australian members of the joint Standards Australia/Standards New Zealand Committee ME-038, Petroleum Pipelines, to supersede AS 2885.3:2012, *Pipelines—Gas and liquid petroleum, Part 3: Operation and maintenance*.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The inclusion of roles and responsibilities in this Standard was approved by the Standards Development and Accreditation Committee on 1 May 2015, as a one-off exemption to the directives of *Standardization Guide 009: Preparation of Standards for Legislative Adoption*.

The objective of this Standard is to set the requirements for the operation and maintenance of gas and liquid petroleum pipelines and to provide important principles, practices and guidelines for use by COMPETENT persons and organizations managing their operation.

This Standard forms part of the AS(/NZS) 2885 series and as such refers to text in other parts of this series. Definitions used in this Standard and throughout the series are now listed in AS 2885.0.

This Standard is a result of a comprehensive revision of AS 2885.3:2012. It reflects a further progression of the concepts initiated in the 2012 revision while supporting the implementation of the revised AS 2885.0 and AS/NZS 2885.6. Additionally, the revision of both AS/NZS 2885.1 and AS 2885.3 in association with the newer AS 2885.0 and AS/NZS 2885.6 required some relocation of text relating to existing assets into AS 2885.3 and some relocation of text out of AS 2885.3 into AS 2885.0 and AS/NZS 2885.6. Clarification has been made regarding the current application of Part 3 for existing PIPELINE SYSTEMS.

While the AS(/NZS) 2885 series comprises separate standalone documents, AS 2885.3 relies upon the concepts and requirements of other Parts of the AS (AS/NZS) 2885 suite and should be read in conjunction with them.

While the key elements of the PMS system are unchanged the major changes in this revision are as follows:

- (a) Generally improved text throughout and reordered content and headings.
- (b) A listing of key documents from all parts requiring periodic review throughout the operating life of the PIPELINE SYSTEM has been included in [Appendix A](#).
- (c) All terms and definitions are now common across the AS(/NZS) 2885 series and have been moved to AS 2885.0.
- (d) Greater flexibility has been introduced for the presentation of the Pipeline Management System documentation. The PIMP has been re-affirmed as a key part of the PMS and its specific content called up throughout the document.
- (e) A periodic fit for purpose (FFP) assessment replaces the Remaining Life Review which had been implemented in the 2012 edition to replace the earlier MAOP review.
- (f) Improved instruction regarding requirements for existing pipelines not designed or conforming to the following AS/NZS 2885.1 design elements:
 - (i) Fracture control.
 - (ii) Pipeline isolation.
 - (iii) MAOP upgrade.
 - (iv) Pressure test records.

- (v) No RUPTURE and maximum energy release rate assessment for HIGH CONSEQUENCE AREAS.
- (g) Improved instruction regarding requirements for external interference management, ANOMALY management and operational changes.
- (h) Further integration of stations within the PIPELINE SYSTEM and greater emphasis on the integrity of stations and safety critical equipment, including introduction of critical function testing requirement for higher risk station facility safe-guarding control and shutdown protection devices.
- (i) Replacement of the term “maximum operating pressure (mop) restriction” to eliminate reported confusion with the maximum operating pressure terminology. RESTRICTED OPERATING PRESSURE (ROP) is now used for managing longer term integrity issues, generally requiring pipeline control parameter adjustments, field set-point adjustments and over-pressure protection system adjustments to operate at a designated lower pressure.
- (j) Clarification that management systems designed to meet Safety Case legislation are acceptable providing they address all of the requirements of this Standard.
- (k) [Appendix G](#) details the part-specific APPROVAL requirements.
- (l) The concept of “External Interference” has evolved in some arenas beyond its intended and originally defined interpretation. Historically, the initial 1997 version of AS2885 referred to external interference as activities that could result in direct contact with the pipeline (excavators, augers, HDD). Some publications over the years have subsequently included in the category of external interference activities such as vehicles loads, soil loads, vibration and blasting. We acknowledge the overlap of concepts, and note that vehicles loads, soil loads, vibration and blasting are typically identified and managed by the same processes that identify excavation over or near the pipeline (i.e. patrols, liaison). The committee has addressed this in this edition with the renaming of [Section 7](#) as Pipeline Corridor Management instead of External Interference.

SMALL CAPS have been used throughout this document to indicate terms that are defined in AS 2885.0 e.g. COMPONENT. While “may”, “should” and “shall” are defined terms, they do not appear in small caps. FULL CAPS have been used throughout this document to indicate abbreviations.

The terms “normative” and “informative” are used in Standards to define the application of the appendices 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

Preface	ii
Section 1 Scope and general	1
1.1 Scope	1
1.2 Basis of AS 2885.3	1
1.3 Application	1
1.3.1 Current application	1
1.3.2 Pipelines in high consequence areas	1
1.3.3 Retrospective application	1
1.4 APPROVAL	1
1.5 Normative references	2
1.6 Terms and definitions	2
1.7 Abbreviations	2
Section 2 Pipeline management system	4
2.1 Basis of section	4
2.2 PMS requirement	4
2.3 PMS elements	4
2.3.1 General	4
2.3.2 Management	4
2.3.3 Planning	6
2.3.4 Measurement and evaluation	7
2.3.5 Consultation, communication and reporting	8
Section 3 Preparation for operation and environmental management	9
3.1 Basis of section	9
3.2 Preparation requirements	9
3.3 Preparation for periodic reviews of management documentation	9
3.4 Environmental management	9
3.4.1 General	9
3.4.2 Native vegetation, fauna and biosecurity	9
3.4.3 Emissions	10
3.4.4 Heritage	10
3.4.5 Water and watercourses	10
3.4.6 Waste	10
3.4.7 Chemical spill	10
3.5 Readiness for operation	10
3.6 Handover to operations	11
3.7 Delayed commencement of operation	12
Section 4 Site safety management	13
4.1 Basis of section	13
4.2 Safety planning — General	13
4.3 Safety planning — Site based assessment	13
4.3.1 Job hazard analysis (JHA)	13
4.3.2 Preliminary JHA	13
4.3.3 On-site JHA	14
4.4 Permit to work system	14
4.5 Electrical hazards safety	14
4.6 Venting and/or purging pipelines	15
4.7 Working on purged pipelines	15
4.8 Welding onto an in-service pipeline	16
4.8.1 Welding requirements	16
4.8.2 Monitoring of operating conditions	16
4.8.3 Resumption of normal operation	16
4.9 Working on pipelines where fluid is escaping	16
4.10 Hot-tapping operations	16

Section 5	PIPELINE SYSTEM integrity management	17
5.1	Basis of section	17
5.2	Integrity management process	17
5.3	Integrity management planning	18
5.3.1	General	18
5.3.2	Integrity activity planning	19
5.3.3	Activity resourcing and scheduling	19
5.4	Executing integrity activities	19
5.5	Delivery monitoring	19
5.6	Fit for purpose assessment	19
5.7	Corrective action determination	20
5.7.1	General	20
5.7.2	PIMP review and update	21
Section 6	Pipeline structural integrity	22
6.1	Basis of section	22
6.2	Structural integrity management	22
6.2.1	General	22
6.2.2	Assessment for high consequence areas	22
6.2.3	Pipeline pressure test records	22
6.2.4	Fracture resistance assessment	23
6.3	Pipe wall integrity threats	24
6.4	Integrity threat mitigation and monitoring	25
6.4.1	General	25
6.4.2	Internal metal loss	25
6.4.3	External corrosion	26
6.4.4	Pipe wall fatigue	27
6.4.5	Land instability	27
6.4.6	Undetected damage	27
6.5	Integrity assessment techniques	27
6.5.1	General	27
6.5.2	In-line inspection	28
6.5.3	Pressure testing	29
6.5.4	Direct assessment	29
6.5.5	Leak detection	30
Section 7	Pipeline corridor management	31
7.1	Basis of section	31
7.2	External interference management	31
7.3	PROCEDURAL CONTROLS	31
7.3.1	General	31
7.3.2	Liaison	32
7.3.3	One-Call services	33
7.3.4	Pipeline marking	33
7.3.5	Agreements with other entities	33
7.3.6	PIPELINE SYSTEM patrol program	33
7.3.7	Remote intrusion monitoring	34
7.4	Corridor surveillance	34
7.5	Controlling activities near PIPELINE SYSTEMS	35
7.5.1	Procedures for controlling third party activities	35
7.5.2	LICENSEE's own activities	37
7.5.3	Stress and strain	37
7.5.4	Placement of material on or near the PIPELINE SYSTEM	37
7.5.5	Vibration in the vicinity of a PIPELINE SYSTEM	37
7.5.6	Vegetation on, or near, the PIPELINE SYSTEM	38
7.5.7	PIPELINE CORRIDOR access	38
7.5.8	Temporary pipelines installed above-ground or with reduced depth of cover	38
Section 8	Station operation and maintenance	39
8.1	Basis of section	39

8.2	General principles for operation and maintenance of stations	39
8.3	Safety critical equipment	40
8.3.1	General	40
8.3.2	Pressure relief devices	40
8.3.3	Control systems and equipment	41
8.3.4	Critical valves	41
8.4	Pressure containing equipment	41
8.4.1	Pressure vessels	41
8.4.2	Piping	41
8.5	Station operational checks	41
8.6	Station structural integrity	42
8.7	Compressor and pump stations	43
8.8	Station local control systems	43
8.9	Pipeline operation and control	44
8.9.1	General	44
8.9.2	Operating parameters	44
8.10	Supervisory control and data acquisition	44
8.11	Site security	45
8.12	General station equipment and components	45
8.12.1	General	45
8.12.2	Above-ground valves	45
8.12.3	Pipeline supports	45
8.12.4	Pipeline soil / air interface	45
8.12.5	Pig trap inspection and maintenance	45
8.12.6	Tunnels and valve pits	46
8.12.7	Buildings housing PIPELINE SYSTEM equipment	46
8.13	Fire and gas protection systems	46
Section 9	ANOMALY assessment and defect repair	48
9.1	Basis of section	48
9.2	ANOMALY management — Initial assessment and response	48
9.3	Anomaly assessment	48
9.3.1	General	48
9.3.2	Key input requirements	49
9.3.3	Recommended anomaly assessment methods	51
9.3.4	Assessment outputs	51
9.3.5	Anomaly-specific acceptance and further assessment criteria	52
9.4	Defect repairs	55
9.4.1	General	55
9.4.2	Repair process	55
9.4.3	Temporary repairs	56
9.4.4	Permanent repairs	56
9.4.5	Repair plan	57
9.5	Repair and mitigation methods	59
9.5.1	General	59
9.5.2	Replacement	59
9.5.3	Grinding	59
9.5.4	Repair sleeves	60
9.5.5	Mechanical sleeves	60
9.5.6	Pipeline de-rating	61
9.5.7	Qualification of alternative repair methods	61
9.6	Pipeline coating repair	61
9.6.1	General	61
9.6.2	Coating repair	61
Section 10	Changes to approved operating conditions	62
10.1	Basis of section	62
10.2	Basic requirements	62
10.3	Design change	62

10.4	Design change assessment.....	62
10.5	MAOP upgrade.....	63
10.6	Restricted operating pressure.....	63
10.7	Increasing a reduced MAOP.....	64
10.8	Pipeline suspension.....	65
10.8.1	General.....	65
10.8.2	Return to service.....	66
10.9	Pipeline failure.....	66
10.10	Pipeline abandonment.....	67
10.10.1	General.....	67
10.10.2	Abandonment in place.....	69
10.10.3	Abandonment by removal.....	69
10.10.4	Segmentation of an abandoned pipeline.....	69
10.10.5	Additional requirements for abandonment.....	69
10.10.6	Abandonment records.....	70
Section 11	Emergency response preparedness.....	71
11.1	Basis of section.....	71
11.2	Emergency planning scope.....	71
11.3	Emergency response plan.....	71
11.3.1	General.....	71
11.3.2	Liaison with emergency services.....	72
11.4	Communicating during an emergency response.....	73
Section 12	Records management.....	74
12.1	Basis of section.....	74
12.2	Principles of records management.....	74
12.3	Design, construction and commissioning records.....	74
12.4	Operation and maintenance records.....	74
12.5	Abandonment records.....	75
Appendix A	(informative) Periodic document review schedule.....	77
Appendix B	(informative) Assessment of ANOMALIES and repair of pipeline DEFECTS.....	78
Appendix C	(informative) PMS and safety case design.....	83
Appendix D	(informative) In-line inspection tools.....	84
Appendix E	(informative) Purging pipelines to air — safety guidance.....	86
Appendix F	(informative) Permit to work.....	88
Appendix G	(informative) Items needing APPROVAL.....	89
Bibliography		91

NOTES

Australian Standard®

Pipelines — Gas and liquid petroleum

Part 3: Operation and maintenance

Section 1 Scope and general

1.1 Scope

Part 3 of the AS(/NZS) 2885 series specifies the minimum requirements for the operation and maintenance of PIPELINE SYSTEMS that fall within the scope of AS 2885.0.

1.2 Basis of AS 2885.3

In addition to the basis and fundamental principles of the AS (AS/NZS) 2885 series defined in AS 2885.0, this Standard is also based upon the following:

- (a) A PMS that covers the PIPELINE SYSTEM, as shown in AS/NZS 2885.0.
- (b) Where stations are complex (e.g. liquid pumping terminals, gas hub stations, major hazard facilities), their operation and maintenance may be more appropriately managed under an alternative standard. The use of any alternative standard and how the application of that standard varies from this Standard shall be APPROVED.

NOTE The requirements of this Standard should be reviewed against those of the alternative standard to confirm that all mandatory aspects have been addressed by that standard.

1.3 Application

1.3.1 Current application

Where an existing PIPELINE SYSTEM does not fully conform to the requirements of the AS(/NZS) 2885 series, or documentation cannot be generated to confirm conformance, the PIPELINE SYSTEM shall be:

- (a) modified to conform, or
- (b) additional controls shall be applied until it is demonstrated that any risk due to the non-conformance is reduced to ALARP.

Any non-conformance and ALARP assessment shall be APPROVED.

1.3.2 Pipelines in high consequence areas

Regardless of pipeline age and design code, the no rupture and maximum energy release rate requirements for pipelines in HIGH CONSEQUENCE AREAS are described in AS/NZS 2885.6.

1.3.3 Retrospective application

Retrospective application of this Standard is governed by AS 2885.0.

1.4 APPROVAL

AS 2885.0 details the requirements for specific documentation APPROVAL under this Standard.

All other APPROVALS required by this Standard shall be APPROVED by a person, position or organization as nominated in the LICENSEE'S APPROVAL structure.

NOTE [Appendix G](#) lists the APPROVAL requirements specific to this Part.

1.5 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document.

NOTE Documents for informative purposes are listed in the Bibliography.

AS 2832.1, *Cathodic protection of metals, Part 1: Pipes and cables*

AS 2885.0, *Pipelines — Gas and liquid petroleum, Part 0: General requirements*

AS/NZS 1020, *The control of undesirable static electricity*

AS/NZS 2885.1, *Pipelines — Gas and liquid petroleum, Part 1: Design and construction*

AS/NZS 2885.2, *Pipelines — Gas and liquid petroleum, Part 2: Welding*

AS/NZS 2885.5, *Pipelines — Gas and liquid petroleum, Part 5: Field pressure testing*

AS/NZS 2885.6, *Pipelines — Gas and liquid petroleum, Part 6: Pipeline safety management*

AS/NZS 3788, *Pressure equipment — In-service inspection*

AS/NZS 4853, *Electrical hazards on metallic pipelines*

1.6 Terms and definitions

For the purposes of this document, the terms and definitions given in AS 2885.0 apply.

1.7 Abbreviations

ALARP	As low as reasonably practicable
APGA	Australian Pipeline and Gas Association
CIPS	Close interval potential survey
CO ₂	Carbon dioxide
CFT	Critical function testing
CP	Cathodic protection
DCVG	Direct current voltage gradient
EMAT	Electromagnetic acoustic transducer
EPA	Environmental Protection Authority
ERP	Emergency response plan
ESD	Emergency shutdown
FEA	Finite element analysis
FFP	Fit for purpose

HAZ	Heat-affected zone
HAZOP	Hazard and operability study
HIC	Hydrogen-induced cracking
ILI	In-line inspection
JHA	JOB HAZARD ANALYSIS
MAOP	Maximum allowable operating pressure
MFL	Magnetic flux leakage (in-line inspection tool)
NDT	Non-destructive testing
OEM	Original equipment manufacturer
PIMP	Pipeline integrity management plan
PMS	Pipeline management system
PPE	Personal protective equipment
PTW	Permit to work
ROP	Restricted operating pressure
SCADA	Supervisory control and data acquisition
SCC	Stress corrosion cracking
SMS	Safety management study
SMYS	Specified minimum yield stress
SWMS	Safe work method statement
SWP	Safe working pressure

Section 2 Pipeline management system

2.1 Basis of section

A management system is necessary to enable pipelines to be operated and maintained to deliver a safe and reliable service.

This Section of the standard details the key requirements for a PMS.

2.2 PMS requirement

A PIPELINE SYSTEM shall have an APPROVED PMS in place before COMMISSIONING. The PMS shall remain in place for the full lifecycle of the PIPELINE SYSTEM to ensure it is maintained in a fit for purpose condition.

The PMS shall detail the LICENSEE's approach to addressing the requirements of this Standard.

NOTE 1 The LICENSEE may satisfy the requirements of this Standard by embedding their PMS in other corporate systems (e.g. an asset management system) and may structure its documentation to best suit its business context, while addressing those aspects that are specific to a pipeline to which the AS(/NZS) 2885 series applies. This may involve documentation having different names, or content being distributed across documents other than those specified, providing the full intent of the requirements specified in AS 2885.3 is fulfilled.

In jurisdictions requiring a safety case, the requirements of the safety case regime may include requirements additional to the PMS. Therefore, in such jurisdictions, a safety case may take the place of the PMS; however, the documentation shall achieve the full requirements of a PMS.

NOTE 2 Guidance on safety case regimes is provided in [Appendix C](#).

2.3 PMS elements

2.3.1 General

The structure of the PMS is flexible; however, it shall conform to the requirements of [Clauses 2.3.2 to 2.3.5](#).

2.3.2 Management

2.3.2.1 Policy and commitment

The PMS shall detail the LICENSEE's approach to the various aspects of managing a PIPELINE SYSTEM as required by this Standard. The PMS shall include statements demonstrating the LICENSEE's commitment to the following key aspects:

- (a) Integrity management.
- (b) Process safety management.
- (c) Environmental management.
- (d) Occupational health and safety management.
- (e) Legal and regulatory requirements.

NOTE A clear commitment by the LICENSEE to specific outcomes forms the basis of the PMS.

2.3.2.2 Management structure

The LICENSEE shall have a defined organization structure for the management of the PIPELINE SYSTEM.

2.3.2.3 Responsibilities, accountabilities and authorities

The responsibilities, accountabilities and authority levels of defined roles with respect to the various aspects of the management of the PIPELINE SYSTEM shall be detailed in the PMS. In particular, roles shall be identified and documented with the responsibility and authority to:

- (a) initiate action to prevent, and if required correct, a loss of integrity, damage to the environment, impact to public, interruption to supply, or an occupational health and safety issue;
- (b) identify and report on any existing or potential deficiencies within the PMS;
- (c) initiate, recommend and APPROVE corrective and preventative actions relating to identified existing or potential deficiencies within the PMS;
- (d) evaluate and verify the effectiveness of any corrective or preventative action implemented; and
- (e) satisfy the mandatory APPROVAL requirements of this Standard.

2.3.2.4 Training and competency

The PMS shall identify the requirements and processes for establishing, maintaining and providing for the training needs of all roles performing functions covered by the PMS. This should include consideration of the operational environment, the identification of any gaps in competency and the necessary training to enable personnel to fulfil their duties.

NOTE Detail on registration as an Oil and Gas Pipeline Engineer and the APGA Pipeline Engineer Competency System can be found at the APGA website. Other competency systems such as those prepared by the Australian National Training Authority may also be useful.

2.3.2.5 Resourcing

The PMS shall identify the process for determining and managing the resourcing, equipment and material requirements for the PIPELINE systems' operation and maintenance.

NOTE Where the PIPELINE SYSTEM is in continuous operation, sufficient personnel should be available to undertake planned and unplanned operations and maintenance, allowing for absences due to leave and training.

2.3.2.6 Change management

The PMS shall identify a process, in accordance with AS 2885.0, for managing, reviewing and approving changes.

In the operational phase, change management is required if the engineering design is being upgraded or modified, or if there is any operational, technical or procedural change to the measures in place which —

- (a) protect the PIPELINE SYSTEM;
- (b) promote public awareness of the PIPELINE SYSTEM;
- (c) operate and maintain the PIPELINE SYSTEM safely;
- (d) provide for the response to emergencies;
- (e) prevent and minimize loss of containment;
- (f) prevent loss of supply
- (f) carry out monitoring and inspections in accordance with the requirements of [Sections 5 to 8](#);
- (g) ensure that the plans and procedures continue to conform to the engineering design; and

- (h) ensure that operation and maintenance personnel are aware of the change and are adequately trained.

NOTE Design changes requiring change management in the operational phase are detailed in [Clauses 10.3](#) and [10.4](#).

2.3.2.7 Review of the PMS

The PMS shall identify procedures for a regular review of its effectiveness and appropriateness.

The PMS shall be reviewed and, if necessary, updated at least every 5 years or in the event of any change to the PMS elements as detailed in [Clauses 2.2](#) and [2.3](#).

NOTE Updating the PMS may be necessary when there is significant change to legislative requirements, the LICENSEE, or organization structure.

2.3.3 Planning

2.3.3.1 General

The PMS shall identify the plans and processes related to the safe operation and maintenance of the PIPELINE SYSTEM during normal and abnormal operations, including emergencies.

2.3.3.2 Planning for normal operation

The PMS shall identify the process for:

- (a) Preparation for operation of new or recommissioned PIPELINE SYSTEMS, in accordance with [Section 3](#).
- (b) Identification of occupational health and safety, and environment hazards and mitigation of risks as described in [Section 4](#) prior to the commencement of any activity.
- (c) Identification of threats and mitigation of risks to the PIPELINE SYSTEM integrity in accordance with [Sections 6, 7](#) and [8](#).

Pipeline operating procedures shall be in place for all operational activities that may impact the reliability of the PIPELINE SYSTEM and the safety of personnel and the public.

2.3.3.3 Planning and preparation for abnormal operations

The PMS shall identify a process for operation of the PIPELINE SYSTEM in circumstances that are different from those initially considered during the design or during significant disruption to normal operations. These circumstances may include the following:

- (a) Operating under backup power supplies.
- (b) Operating without key assets such as compressors or pumps.
- (c) Operating at no flow, low flow, pressure or line pack levels.

NOTE For no flow conditions, the process should identify when pipeline becomes suspended rather than in abnormal operations, see [Clause 10.8](#).

- (d) Operating under communication outages.
- (e) Operating under alternative conditions to maintain safety of a damaged PIPELINE SYSTEM.

The process should consider and document the period for which abnormal operations can be sustained without additional controls in place.

2.3.3.4 Isolation plan

The PMS shall identify an isolation plan in accordance with AS/NZS 2885.1. The plan shall cover the PIPELINE SYSTEM. The isolation plan shall be reviewed for currency at intervals not exceeding 5 years to ensure it remains valid throughout the operational life of the PIPELINE SYSTEM.

2.3.3.5 Emergency planning and preparation

The PMS shall identify a process for managing emergency events resulting from the PIPELINE SYSTEM's operation and maintenance and from external events that may affect the safe and reliable operation of the PIPELINE SYSTEM, in accordance with [Section 11](#).

2.3.3.6 Records management

The PMS shall identify a process for managing records resulting from the PIPELINE SYSTEM's operation and maintenance in accordance with [Section 12](#).

2.3.4 Measurement and evaluation

2.3.4.1 General

The PMS shall identify the process for measurement and evaluation of the performance of the PIPELINE SYSTEM.

2.3.4.2 Performance evaluation

The PMS shall identify a process to monitor trends in the operation and performance of the PIPELINE SYSTEM. The process shall also describe the actions taken when monitored trends exceed defined limits.

NOTE System controls, particularly those defined as critical controls, should have defined performance standards. Performance against those standards should be monitored.

2.3.4.3 Accident or incident investigation and reporting

The PMS shall describe the processes for identifying, investigating, recording and reporting, accidents or incidents that either cause or have the potential to cause —

- (a) injury or death to operating and maintenance personnel or the public;
- (b) significant or material damage to the environment; or
- (c) significant impact on the PIPELINE SYSTEM's operation or integrity.

NOTE Accident and incident investigations should identify relevant root causes and corrective actions to address these root causes.

2.3.4.4 Audits

The PMS shall identify a process for establishing audits to confirm conformance with the requirements for the PMS and validate the effectiveness of the controls, plans and processes it references. The outcomes of audits shall be documented and APPROVED.

NOTE AS/NZS ISO 9001 and ISO 19011 provide auditing guidance.

2.3.4.5 Corrective and preventative action

The PMS shall identify the process for determining, approving and implementing corrective and preventative actions.

NOTE Corrective actions are taken to deal with an existing issue, while preventive actions address potential issues.

The basis and expected effectiveness for any action shall be APPROVED.

2.3.5 Consultation, communication and reporting

The PMS shall identify the process for consultation with, and communication and reporting to, identified stakeholders.

Section 3 Preparation for operation and environmental management

3.1 Basis of section

Preparation for operation is a distinct phase in a PIPELINE SYSTEM lifecycle and is the phase that enables a PIPELINE SYSTEM (new, modified or returned from suspension) to be handed over from the COMMISSIONING phase (refer to AS/NZS 2885.1) to the operations and maintenance phase.

This Section of the Standard identifies key aspects and minimum requirements that need to be addressed during preparation for operation or operational readiness.

3.2 Preparation requirements

A process shall be established to coordinate the engagement of stakeholders and the preparation of the PIPELINE SYSTEM for pre-commissioning, commissioning, handover and ongoing operation.

Preparations for operation shall only be deemed complete when the plans and procedures set out in this Section have been implemented. A detailed handover process shall be undertaken including the involvement of key operating personnel.

3.3 Preparation for periodic reviews of management documentation

[Appendix A](#) details the key reviews relating to the operational phase and their maximum interval, including requirements relating to other parts of the (AS/NZS) 2885 series.

3.4 Environmental management

3.4.1 General

The PMS shall identify and assess where the operation of the PIPELINE SYSTEM has the potential to cause harm to the environment.

Mitigation activities to avoid, minimize, or mitigate the risk including any residual requirements from design and construction shall be detailed in the PMS.

NOTE The APGA Code of Environmental Practice provides industry accepted guidance on environmental risks and controls throughout a PIPELINE SYSTEM's lifecycle.

The key environmental aspects for identifying and assessing risk are outlined below.

3.4.2 Native vegetation, fauna and biosecurity

PIPELINE maintenance programs should be managed to minimize impact on the public and the environment.

Activities that may impact native vegetation, fauna and biosecurity include:

- (a) easement vegetation clearing to provide access and line-of-sight between markers;
- (b) biosecurity management;
- (c) maintaining easement and access tracks; and
- (d) maintaining signage.

NOTE Biosecurity is the protection of the environment, economy and public health from negative impacts associated with pests, diseases, and weeds.

3.4.3 Emissions

PIPELINE SYSTEM emissions include greenhouse gases, odour, noise, vibration, dust and light. The PMS shall identify the processes which implement controls to manage emissions.

3.4.4 Heritage

The PMS shall identify the processes which implement controls to manage sections of the pipeline corridor where there is a potential for pipeline activities to impact heritage areas.

NOTE Aboriginal, natural and built heritage is protected by state, territory and Commonwealth laws.

3.4.5 Water and watercourses

Where activities are anticipated in the vicinity of a watercourse, necessary controls shall be developed and implemented within the PMS to avoid contamination of the watercourse.

NOTE 1 Liaison with stakeholders such as water and port authorities, EPA and local councils may be required for liquids pipelines where spills may spread to watercourses.

NOTE 2 A watercourse is any area, natural and artificial, where water flows or water is contained either permanently, semi-permanently or periodically including surface and groundwater resources.

3.4.6 Waste

Waste materials from pipeline operations and maintenance may be hazardous or cause environmental harm. Procedures for their handling, disposal, transport and storage requirements shall be developed so that the associated hazards are appropriately mitigated.

NOTE State, Territory and Commonwealth legislation governs waste management.

3.4.7 Chemical spill

Chemicals require specific planning for storage and handling to minimize the risk of a chemical spill and the associated environmental harm.

Situations requiring specific chemical spill response planning shall be identified and, where necessary, specific spill response training shall be conducted.

3.5 Readiness for operation

Operation of a PIPELINE SYSTEM shall not commence or recommence unless the following actions have been completed:

- (a) The latest SMS (e.g. design, post-construction or pre-commissioning) has been reviewed by operations personnel and all relevant operating actions have been implemented.

NOTE 1 It is important for operations personnel to understand the THREATS and PROCEDURAL CONTROL measures specific to the PIPELINE SYSTEM.

- (b) A PMS including a PIMP is in place and all relevant plans and procedures for the safe operation and maintenance activities of the PIPELINE SYSTEM.
- (c) Pipeline control operating procedures are in place.
- (d) An isolation plan is in place.
- (e) The pipeline conforms to the requirements of the AS(/NZS) 2885 series, unless otherwise approved in accordance with [Clause 1.3.1](#).

- (f) The pressure STRENGTH TEST and LEAK TEST requirements in accordance with AS/NZS 2885.5 have been achieved and documented.
- (g) The MAOP has been established.
- (h) Pressure control and over-pressure protection systems are operational.
- (i) Any weld which has not been subjected to testing in accordance with Item (f), has been inspected by an APPROVED non-destructive examination method and conforms to AS/NZS 2885.1 and AS/NZS 2885.2.
- (j) Where practicable to test, all COMPONENTS shall have met the requirements for operation.
- (k) Where not practicable to test or where COMPONENTS are not operational items, other inspections of the COMPONENTS shall have been carried out.
- (l) Operating, maintenance and emergency personnel have been trained.
- (m) The pipeline is cathodically protected as required by AS/NZS 2885.1.
- (n) Pipeline corridor management THREAT mitigation measures have been implemented in accordance with [Section 7](#).

NOTE 2 Additional site-specific aspects may need to be evaluated prior to commencement of operation.

Initial operations before completion of field work shall be APPROVED, provided the incomplete work does not directly affect the environment, or safety of the pipeline, the public, or the operating personnel, or provided alternate temporary provisions have been made.

3.6 Handover to operations

Handover of a commissioned PIPELINE SYSTEM occurs at the completion of the COMMISSIONING phase with the LICENSEE APPROVING completion of the COMMISSIONING and passing control of the system to operations (refer to AS/NZS 2885.1).

NOTE Operation of the PIPELINE SYSTEM post-COMMISSIONING may involve multiple groups of construction and COMMISSIONING personnel working to resolve outstanding issues stemming from construction and COMMISSIONING. This phase of operations contains additional THREATS as new systems and management personnel may be introduced, with a number of concurrent work sites and the level of site activities may be unusually high.

The handover process shall transfer the management and control of the PIPELINE SYSTEM at a defined point.

Preparation for the transfer to operations shall include receipt of critical documentation from the design and construction phase (refer to AS/NZS 2885.1).

The following list provides further guidance on the items that should be included in the transfer process and inspected by operational and maintenance personnel:

- (a) Finalised and accurate as-built design and construction records and documents.
- (b) Finalised manufacturers' data report for station equipment and pipeline components.
- (c) Construction and commissioning punch lists, with no items impacting safe operation.
- (d) Inventory of pipeline tools, spare line-pipe and parts location, and all related supply/testing documentation.
- (e) Register of landholder and third-party records and liaison documentation.
- (f) Specialist vendor training for operations personnel.

- (g) Information for the PMS in a form suitable for the initial operation of the PIPELINE SYSTEM.
- (h) Information for the Environmental Management Plan in a form suitable for the initial operation of the PIPELINE SYSTEM.
- (i) Information for the Records Management Plan in a form suitable for the initial operation of the PIPELINE SYSTEM.
- (j) Information for the Emergency Response Plan in a form suitable for the initial operation of the PIPELINE SYSTEM.
- (k) Electronic files, software and licences such as SCADA and logic controller programs.
- (l) Records of training or briefing of operational and control room personnel on COMMISSIONING issues.
- (m) Records of liaison with regulatory authorities.
- (n) Comprehensive equipment listing and equipment maintenance plans.

3.7 Delayed commencement of operation

AS 2885.1 outlines considerations for delayed commencement of operations, when a PIPELINE SYSTEM is not placed into operation immediately following COMMISSIONING. In these circumstances, the PIPELINE SYSTEM shall be prepared for operation (see [Clause 3.5](#)) and then regarded as fully operational and operated and maintained in conformity to this Standard.

A Change of Operating Conditions SMS (as described in AS 2885.6) should be undertaken to identify whether additional controls are necessary, or whether particular control/s should be suspended until commencement of operation. The PIMP shall be updated with any changes.

Should a pipeline inspection reveal that ANOMALIES have occurred, they shall be assessed in accordance with [Section 9](#).

Section 4 Site safety management

4.1 Basis of section

The work environment in which pipeline personnel are required to work is crucial to consider when planning operations and maintenance activities.

This Section of the Standard sets out the requirements for key aspects of site safety management that should be reflected in operations and maintenance procedures.

4.2 Safety planning — General

Planning processes for operational tasks shall take into account the field environment to identify and mitigate any risks that might impact the PIPELINE SYSTEM, personnel and the public, as follows:

- (a) Where remote travel or work is required, management processes shall be determined and implemented for communication, emergency first aid and rescue.
- (b) All non-routine field work requires specific planning, which shall be approved.
- (c) Work sites shall be specifically prepared to avoid the introduction of hazards from vehicles, plant and equipment.

All on-site operating personnel shall be fully informed of the scope of the work and any associated risks and shall be COMPETENT to undertake their part of any procedure.

4.3 Safety planning — Site based assessment

4.3.1 Job hazard analysis (JHA)

A JHA shall be undertaken prior to work being performed on any part of a PIPELINE SYSTEM in order to identify and mitigate hazards.

NOTE Alternate forms of site based safety assessment may be used, e.g. work permits, safe work method statement (SWMS) or procedural requirements, provided they meet the intent outlined in [Section 4.3](#).

The hierarchy of controls should be applied in the following order:

- (a) Elimination.
- (b) Substitution.
- (c) Isolation.
- (d) Engineering controls.
- (e) Procedural and administrative controls.
- (f) Protective equipment (including personal protective equipment).

Where safety risks cannot be eliminated, procedures or practical actions to mitigate them should be implemented.

Where any necessary operational controls are identified, they shall be documented.

4.3.2 Preliminary JHA

Preliminary JHAs may be prepared for repetitive or routine activities.

For complex or non-routine operational or maintenance work, a preliminary JHA should be prepared by COMPETENT personnel, prior to mobilization to site.

All credible hazards shall be assessed, and mitigations prepared for implementation.

4.3.3 On-site JHA

An on-site JHA shall be completed, or the preliminary JHA augmented, to identify all hazards, including any site-specific hazards and to implement necessary controls.

All members of the work party, including subcontractors, vendors and visitors, shall be briefed with respect to the risks and the control actions.

Should site circumstances change, or a mitigation method fail, the hazard shall be re-assessed, and work suspended if necessary, until the JHA and controls have been reviewed.

Should emergency work demands create a situation where personnel are likely to exceed normal work cycle maximums, this shall be documented and mitigated, as necessary, in the on-site JHA and noted in the work permit records.

4.4 Permit to work system

The PMS shall identify a range of permit classes for the following:

- (a) Cold work.
- (b) Hot work.
- (c) Entry to confined spaces.
- (d) Excavation and mechanical disturbance in the close vicinity of live pipelines.

Potential interaction between activities at multiple work sites shall be managed by the permitting processes.

Where circumstances or the work environment changes, the permit should be reviewed, and the permit may be withdrawn at any time and the work suspended.

NOTE [Appendix F](#) provides additional information regarding permit-to-work practices.

4.5 Electrical hazards safety

To prevent an accidental ignition of possible hazardous concentrations of flammable vapour or gas due to electrical hazards, precautions shall be taken.

The PMS shall identify the procedural requirements and the training and instruction for operating and maintenance personnel with respect to the following:

- (a) The possibility of electric surges (sparks) across insulated joints.
- (b) Precautions for working on a coated pipeline which is exposed to induced a.c. voltage (low frequency induction), earth potential rise effects, direct lightning strikes, or d.c. voltage conduction (interference bonds to d.c. traction systems).
- (b) Safe static discharge in accordance with the guidance in AS/NZS 1020.
- (c) Electrical connection requirement across flanges being separated, or across pipeline cuts.
- (d) Identification and implementation of actions to eliminate ignition sources where the potential for a hazardous atmosphere exists.

NOTE Unless there is existing bonding or earthing, an electrical connection between both sides of the separated sections will avoid sparking.

Procedures shall be developed in accordance with AS/NZS 4853 so that the mitigation equipment installed as part of the design is maintained and, if necessary, improved to protect personnel from excessive touch voltages.

4.6 Venting and/or purging pipelines

All pipeline purging and venting operations shall be in accordance with approved procedures which shall address the following:

- (a) Minimization of pipeline inventory release.
- (b) Isolation of the pipeline from the supply system.
- (c) Excessive noise.
- (d) Release of flammable materials.
- (e) Mixing of fluids during purging.
- (f) Monitoring and measuring systems to confirm the effectiveness of the purging activity.
- (g) Management of temperature excursions.

NOTE 1 [Appendix E](#) provides additional guidance for purging activities.

Prior to commencing a purging operation to remove a fluid, the pipeline shall be isolated from the fluid source. Where a pipeline is unable to be positively isolated with a double block and bleed or similar, mitigation shall be implemented to manage risks associated with any hazardous vapours or liquids continuing to enter the pipeline.

NOTE 2 Single-valve isolation may not provide reliable isolation and should be avoided or enhanced with additional facilities where possible.

4.7 Working on purged pipelines

A purged pipeline shall be deemed unsafe for hot work until gas sampling confirms that the contents of the pipeline are safe for the operation to be carried out.

NOTE [Appendix E](#) provides guidance for working safely with purged pipelines.

Welding, thermal cutting, or other hot work operations shall not be permitted where a pipeline, which has been filled with air, is connected to a source of hydrocarbon fluid that cannot be completely isolated unless —

- (a) the flow of hydrocarbon fluid towards the work site is prevented; and
- (b) the pipeline contents at the work site are tested continuously to confirm that the concentration of hydrocarbon fluid is safe.

This may require —

- (i) the generation of airflow within the pipeline away from the work, by the operation of air movers at locations where any residual vapour can be safely released; or
- (ii) the installation of pipeline stop devices (e.g. inserted or pigged stopping plugs or spheres with bleed vents on each side of the work site), taking care that this does not impede or prevent airflow that may be required for Item (i) above.

4.8 Welding onto an in-service pipeline

4.8.1 Welding requirements

Welding onto an in-service pipeline is a specialist process that requires trained and COMPETENT personnel to mitigate risks. Specific welding considerations and NDT requirements are specified in AS/NZS 2885.2.

Welding procedures shall cover the specific tasks and detail the required operating conditions in accordance with the relevant requirements of AS/NZS 2885.2.

All necessary controls specified in the welding risk review and welding procedures shall be implemented.

4.8.2 Monitoring of operating conditions

While any welding is in progress, the requirements of the welding procedure shall be monitored. Welding shall be discontinued at any time when the pressure, flow rate or heat sink capacity measurement is outside of the specified limits.

4.8.3 Resumption of normal operation

Following a repair, the pressure in a pipeline shall not be increased outside of the limits specified in the welding procedure until the repair has been visually inspected, subjected to NDT and after the inspection has confirmed that it is safe for normal operation to be resumed.

4.9 Working on pipelines where fluid is escaping

A JHA shall confirm a work procedure and detail any liaison requirements and mitigation to safeguard pipeline operations personnel, third parties and the surrounding area, where working on pipelines where fluid is escaping.

All requirements of the JHA shall be implemented and maintained.

Any cutting of pipelines that contain or have contained liquid petroleum or HVPL that has not been purged shall only be carried out following assessment of the inherent risks. The assessment shall specify a safe work method for repairing the pipeline. Any heat generated shall be maintained below the product flashpoint.

NOTE AS/NZS 2885.2 details specific requirements for the hot repair of gas-filled pipelines.

4.10 Hot-tapping operations

Any hot-tapping operation shall be carried out in accordance with an approved hot-tapping procedure.

NOTE For guidance on hot tapping procedures, refer to Weld Australia (formerly WTIA) TN 20 and AS/NZS 2885.2.

Section 5 PIPELINE SYSTEM integrity management

5.1 Basis of section

Integrity management is a critical activity to enable a safe and reliable PIPELINE SYSTEM throughout its lifecycle.

This Section of the Standard details the requirements for maintaining the PIPELINE SYSTEM in a fit for purpose condition.

5.2 Integrity management process

The integrity management process is ongoing throughout the lifecycle of the pipeline and follows a plan→do→check→act cycle as shown in [Figure 5.1](#).

Integrity requirements should include any controls established by the design and identified by SMS to protect the assets and the public.,

Modification to controls to maintain effectiveness may be required.

All controls and modifications determined by the integrity management process shall be documented in a PIMP. A PIMP may reference other PMS plans and procedures, including engineering documentation and equipment maintenance plans.

NOTE Engineering documentation and maintenance plans could be contained within an electronic work order management system.

A PIMP shall exist for all PIPELINE SYSTEMS and be available to all personnel who require access to it.

A PIMP —

- (a) may exist in either hardcopy or electronic form, and
- (b) may address several licences.

Records of integrity management activities as identified in [Clause 12.4](#) shall be retained.

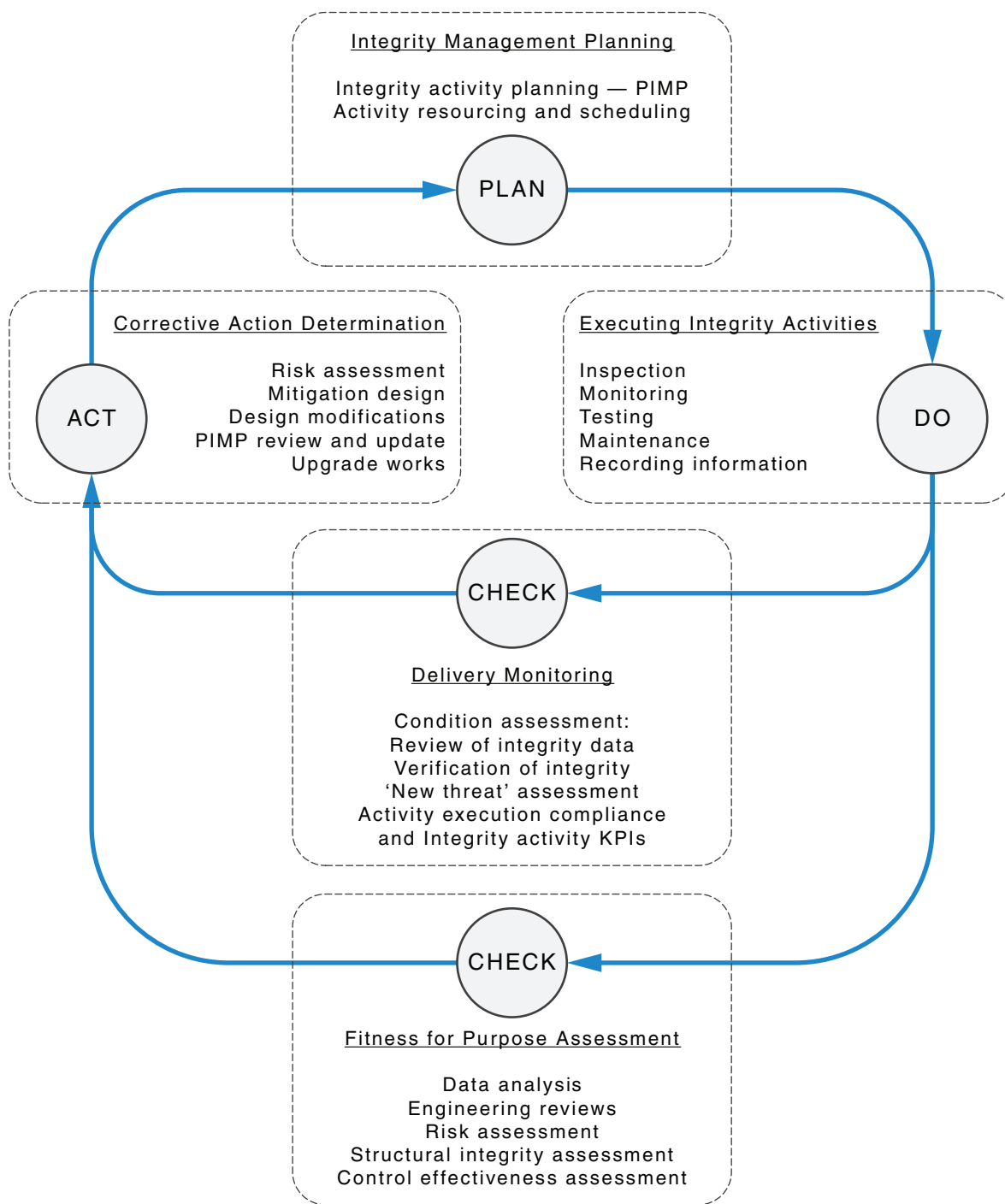


Figure 5.1 — Pipeline integrity management process

5.3 Integrity management planning

5.3.1 General

Integrity management planning provides the basis for a PIPELINE SYSTEM to be managed in a fit for purpose condition throughout its lifecycle. The PIMP shall include key integrity-based information relating to —

- (a) the design and construction of the PIPELINE SYSTEM;

- (b) the operating history and conditions;
- (c) results of assessments; and
- (d) necessary routine activities.

The PIMP shall document the activities that provide for the ongoing integrity of the PIPELINE SYSTEM, including those activities identified in the following:

- (i) Pipeline structural integrity, see [Section 6](#).
- (ii) Pipeline corridor management, see [Section 7](#).
- (iii) STATION operation and maintenance, see [Section 8](#).
- (iv) ANOMALY assessment and DEFECT repairs, see [Section 9](#).
- (v) Changes to APPROVED operating conditions, see [Section 10](#).

5.3.2 Integrity activity planning

The PIMP shall include sufficient information that the background, logic and performance criteria behind any specific integrity activities are clear so that their relative importance can be understood.

The PIMP shall also specify any data or documentation or both, required to be retained as part of those activities.

5.3.3 Activity resourcing and scheduling

The operation and maintenance activities detailed in the PIMP shall be resourced to adequately meet the specified performance criteria.

The levels of personnel and equipment necessary to deliver work programs conforming to the PIMP's schedule should be determined and pre-planned, see [Clause 2.3.2.5](#).

5.4 Executing integrity activities

Constrained resources can restrict the capability to deliver any integrity-based activity in a timely fashion. The potential impact upon safety and PIPELINE SYSTEM integrity shall be assessed and managed.

5.5 Delivery monitoring

Monitoring processes shall be undertaken to identify any deficiencies in the delivery of any planned activities to enable the early determination and implementation of corrective action.

NOTE Monitoring can provide key data for integrity assessments and SMS reviews.

5.6 Fit for purpose assessment

The FFP assessment is a formalized process for demonstrating that a PIPELINE SYSTEM can be safely operated until the next assessment and is fundamental to confirming the current condition of the pipeline and effectiveness of the PIMP'S integrity requirements.

The FFP assessment for a pipeline system shall be completed no more than 10 years after commissioning, and thereafter at intervals not exceeding 10 years.

The FFP assessment interval shall be prior to the time that the integrity of the pipeline may be compromised as determined utilizing the anomaly degradation rates (see [Clause 9.3.2.4](#)).

An FFP assessment interval less than 10 years may be determined by the previous FFP review.

The FFP and the review schedule for the next FFP shall be APPROVED.

NOTE 1 For the purposes of this clause, the AS2885.3:2012 Remaining Life Review and AS 2885.3:2007 MAOP review are deemed to have been a FFP review.

An FFP assessment should draw upon a range of information to demonstrate that a PIPELINE SYSTEM can be safely operated until the next assessment. This information at a minimum should include —

- (i) pipeline anomalies and their degradation rate established from ILI surveys, direct assessments or other methods providing equivalent results;
- (ii) remedial action(s) taken to mitigate defects (e.g. ROP or MAOP reduction, temporary repairs);
- (iii) operating pressure, temperature cycles, fluid composition and fluid properties (e.g. dew point);
- (iv) limitations of the fracture control methods;
- (v) reviews of the protection systems for pressure and temperature;
- (vi) corrosion protection records including those related to coating system condition, corrosion data coupons and probes, CP monitoring, and corrosion inhibition;
- (vii) assessment of new threats to the PIPELINE SYSTEM, changes to location classifications and integrity specific actions as identified from the latest SMS;
- (viii) change in environmental factors;
- (ix) equipment functionality and reliability;
- (x) findings of any fatigue assessments;
- (xi) pipeline corridor records including vegetation, erosion, subsidence, encroachment and land usage changes;
- (xii) outcomes from any investigation, including root cause analysis, undertaken for any failure event;
- (xiii) other operational performance metrics; and
- (xiv) effectiveness of equipment as outlined in the isolation plan.

The key objective of the FFP assessment shall be to document —

- (A) confirmation that the PIPELINE SYSTEM can continue to safely operate at MAOP until the next FFP assessment is completed in accordance with this Standard; or
- (B) where (A) cannot be achieved without corrective actions, details of the interim operating strategy and the scheduling for any corrective actions, see [Clause 5.7](#); and

NOTE 2 The application of an ROP as per [Clause 10.5](#) or an MAOP downgrade may be necessary.

- (C) schedule for the next FFP assessment. The schedule should be brought forward if any event that would impact the PIPELINE SYSTEM's fitness-for-purpose occur.

5.7 Corrective action determination

5.7.1 General

Determining and taking corrective action is a part of the integrity management process. Corrective actions may involve assessment of pipeline threats, PIPELINE SYSTEM design modifications and upgrade works. Where corrective actions have been specified for continued safe operation then a consolidated plan of activities shall be prepared and delivered.

5.7.2 PIMP review and update

The PIMP shall be updated when additional integrity-based activities, corrective actions or changes to existing activities are necessary.

The PIMP shall otherwise be reviewed for currency and re-APPROVED at intervals not exceeding 5 years so that it remains valid for the PIPELINE SYSTEM structural condition and THREAT mitigation requirements, as determined by the integrity management process.

NOTE While the FFP is based upon a 10-year cycle and the PIMP a 5-year cycle, their update cycles do not necessarily need to be linked or coincide. Both should be updated whenever new information becomes available.

Section 6 Pipeline structural integrity

6.1 Basis of section

Pipe wall integrity of MAINLINE PIPE and PIPELINE ASSEMBLIES is achieved when the pipeline is leak-tight, operating within its design parameters, and all THREATS to structural integrity that it may be subjected to are controlled.

This Section of the standard details the minimum requirements for the protection and monitoring of the pipe wall integrity.

[Section 7](#) details the requirements for managing threats associated with external interference.

6.2 Structural integrity management

6.2.1 General

To maintain the structural integrity of the pipeline, all THREATS that may impact the pipe wall shall be identified.

The planning required to maintain the controls mitigating the identified structural integrity THREATS shall be documented in or referenced by the PIMP.

NOTE The data and information identified and collected during the application of these plans (including activities, assessments, and reviews) should form the basis for ongoing program of assessment relating to the risk and integrity of the pipeline. The findings of such a program will determine what responses are necessary for the continuous, safe, and reliable operation of the pipeline.

6.2.2 Assessment for high consequence areas

Assessments for conformance to no rupture and maximum release rate requirements shall be summarized (or referenced) in the PIMP, including the results of any formal ALARP assessment and subsequent control implementation to achieve ALARP.

Where risk reduction measures to achieve ALARP involve PHYSICAL CONTROLS or PROCEDURAL CONTROLS they shall be documented in the PIMP.

6.2.3 Pipeline pressure test records

6.2.3.1 General

Pipeline pressure tests validate the strength of a pipeline, from which the operational limits can be determined. A pressure test will confirm the pipeline is free from critical DEFECTS at the time of the test. Historical pressure test records can be used to confirm the pipeline is free from critical construction-related DEFECTS such as milling ANOMALIES, laminations and weld DEFECTS. Time-dependent THREATS such as corrosion, cracking or DENTS should be managed through other inspections.

Pressure test records shall be kept and available in accordance with [Section 12](#).

6.2.3.2 Pipelines with pressure test records not conforming to AS/NZS 2885.5

A pipeline that has an existing pressure test record that does not conform to the current requirements of AS/NZS 2885.5 shall be reviewed against the currently specified test pressure, length of test, and factor of safety. Where there are differences, an engineering assessment shall be undertaken to assess whether additional control measures are required until it is demonstrated that the risk of a failure at MAOP is reduced to ALARP and the PIMP shall be updated accordingly.