

ISO/~~DIS~~FDIS 12747:2024(en)

ISO/TC 67/SC 2

Secretariat: UNI

Date: ~~2024-12-10~~2025-02-14

Oil and gas industries including lower carbon energy — Pipeline transportation systems — Requirements and guidance for pipeline life extension assessment

Industries du pétrole et du gaz naturel — Systèmes de transport par conduites — Pratique recommandée pour une longue durée des conduites

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[ISO/FDIS 12747](https://standards.iteh.ai/catalog/standards/iso/0589373d-865b-48e7-8ed2-1ac07ac3b5e9/iso-fdis-12747)

<https://standards.iteh.ai/catalog/standards/iso/0589373d-865b-48e7-8ed2-1ac07ac3b5e9/iso-fdis-12747>

FDIS stage

iTeh Standards
(<https://standards.itih.ai>)
Document Preview

ISO/FDIS 12747

<https://standards.itih.ai/catalog/standards/iso/0589373d-865b-48e7-8ed2-1ac07ac3b5e9/iso-fdis-12747>

ISO/~~DIS~~FDIS 12747:20242025(en)

© ISO ~~2024~~2025

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ~~ISO's~~ISO's member body in the country of the requester.

ISO ~~Copyright Office~~copyright office

CP 401 • ~~Ch. de Blandonnet 8~~

CH-1214 Vernier, Geneva

Phone: + 41 22 749 01 11

~~Email: E-mail: copyright@iso.org~~

Website: www.iso.org

Published in Switzerland.

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[ISO/FDIS 12747](#)

<https://standards.iteh.ai/catalog/standards/iso/0589373d-865b-48e7-8ed2-1ac07ac3b5e9/iso-fdis-12747>

Contents—Page

Foreword.....	iv
Introduction.....	vi
1 Scope.....	1
2 Normative references	1
3 Terms and definitions.....	1
4 Abbreviated terms	8
5 Life extension overview	9
5.1 General.....	9
5.2 Assessment process.....	10
5.3 Assessment requirements.....	10
5.4 Limitations on life extension	14
5.5 Pipeline system availability.....	15
6 Data compilation	16
7 Structural integrity of the pipeline system	17
7.1 General.....	17
7.2 Structural integrity assessment.....	17
7.3 PIMS review.....	18
7.4 Remediation requirements.....	18
8 Future threat identification	18
9 Life extension assessment.....	19
9.1 Risk assessment.....	19
9.2 Pipeline system design review.....	21
9.3 Assessment of remnant life	23
9.4 Integrity management during extended life.....	26
9.5 Regulatory requirements	28
9.6 Update of systems and procedures.....	28
10 Life extension report.....	28
Annex A (informative) Considerations for lifetime extension of unbonded flexible pipe.....	30
Annex B (normative) Change of fluid.....	33
Annex C (informative) Typical data requirements.....	35
Annex D (informative) Defect and anomaly assessment guidance	39
Annex E (informative) Common threats to rigid pipelines.....	41
Annex F (informative) Inspection, testing, monitoring and sampling techniques.....	42
Bibliography	45

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 67, *Oil and gas industries including lower carbon energy*, Subcommittee SC 2, *Pipeline transportation systems*.

This first edition cancels and replaces ISO/TS 12747:2011, which has been technically revised.

The main changes are as follows:

- ~~Assessment~~**assessment** requirements for lifetime extension considering a change of pipeline fluid, beyond that which can occur naturally as fluid sources or compositions change, have been incorporated;
- ~~Additional~~**additional** references to codes and standards detailing assessment approaches suitable for the assessment of threats identified as part of a lifetime extension assessment have been added, and the existing references updated as appropriate;
- ~~Guidance~~**guidance** on the following has been provided:
 - ~~assessment~~ approaches for common pipeline features that may limit remnant life;
 - ~~additional~~ considerations for maintaining the integrity of risers within caissons and j-tubes;
 - ~~appropriate~~ inspection, testing, monitoring and sampling techniques that can be used to mitigate risks during any period of extended operation;
 - ~~factors~~ affecting the future operability of the system that should be addressed as part of lifetime extension in addition to the structural integrity of the pipeline system;
 - ~~lifetime extension~~ considerations for unbonded flexible pipe.

ISO/~~DIS~~FDIS 12747:2024/2025(en)

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

iTeh Standards
(<https://standards.itih.ai>)
Document Preview

ISO/FDIS 12747

<https://standards.itih.ai/catalog/standards/iso/0589373d-865b-48e7-8ed2-1ac07ac3b5e9/iso-fdis-12747>

Introduction

The purpose of this document is to detail a suitable approach to pipeline life extension assessment that can be applied by operators (or parties acting on their behalf) across the industry. It is concerned with the proof of structural integrity of the pipeline system for the justification of extended operation. Integrity management is not covered in detail. However, the interface between a [pipeline integrity management system \(PIMS\)](#) and the life extension process is considered because:

- a PIMS, where present, forms an integral part of the integrity assessment of the pipeline system;
- a PIMS of some form is required for operation in extended life.

Factors affecting the future operability of the system but not the structural integrity, such as deterioration of topsides equipment or the loss of a control umbilical, are flagged as requiring assessment but are not addressed in full in this document.

NOTE Further guidance on the lifetime extension of subsea systems, including umbilicals and topsides equipment, is provided in NORSOK U-009.

Whilst this document is aimed primarily at the pipeline operators, it can also be of interest to other stakeholders such as:

- regulators approving the life extension application;
- members of the public affected by the life extension application, such as other users of maritime waters, landowners and developers.

Considering this, an overview of the life extension process and the key principles involved is given in [Clause 5](#). The remainder of the document is intended to detail requirements of the process and to provide guidance to those performing the life extension assessments. All guidance presented is intended for use in conjunction with sound engineering practice and judgment.

This document is not intended for use as a design standard.

[ISO/FDIS 12747](#)

<https://standards.iteh.ai/catalog/standards/iso/0589373d-865b-48e7-8ed2-1ac07ac3b5e9/iso-fdis-12747>

Oil and gas industries including lower carbon energy — Pipeline transportation systems — Requirements and guidance for pipeline life extension assessment

1 Scope

This document presents assessment requirements and associated guidance for extending the service life of a pipeline system, as defined in ISO 13623, beyond its specified design life. It applies to both onshore and offshore rigid metallic pipelines and risers ~~(including steel catenary risers (SCRs)-)~~.

This document is not directly applicable to the following:

- flexible pipelines;
- pipelines constructed from other materials, such as glass reinforced plastics or polymers;
- umbilicals (control or chemical conveyance service, or both);
- topsides equipment and piping (outside of pipeline system limits defined in accordance with local regulatory requirements);
- pipeline protection and support structures and components.

However, the assessment process defined herein can be applied in the lifetime extension assessment of the above at the discretion of the user.

This document addresses life extension, which is a change to the original design premise. It is also applicable to other changes to the design premise, such as ~~MAOP~~ **maximum allowable operating pressure (MAOP)** re-ratings or a change to the conveyed fluids, at the discretion of the user.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

For the purposes of this document, the following terms and definitions apply.

ISO/~~DIS~~FDIS 12747:2024/2025(en)

~~3.23.1~~ **3.1**

acceptance criteria

specified indicators or measures employed in assessing the ability of a component or system to perform its intended function

~~3.33.2~~ **3.2**

ancillary component

component attached to the pipe or piping within the *pipeline system* (3.18(3.19)) with additional functions to the conveyance of fluid, such as to monitor pipeline parameters or control pipeline conditions or flow

Note 1 to entry: This includes valves, pressure indicators, temperature gauges, corrosion probes, steel catenary riser (SCR) flex joints, etc.

~~3.43.3~~ **3.3**

anomaly

discrepancy or deviation of an element of the *pipeline system* (3.18(3.19)) from the established rules and limits

~~3.53.4~~ **3.4**

anomaly limits

criteria set as part of the design and *pipeline integrity management system (PIMS)* (3.16) processes to enable determination of *anomalies* (3.3)

~~3.63.5~~ **3.5**

design life

period for which the design basis is planned to remain valid

[SOURCE: ISO 13623:2017, 3.1.2]

~~3.73.6~~ **3.6**

failure

event in which a component or system does not perform according to its operational requirements.

~~3.83.7~~ **3.7**

flow assurance

ensuring successful and economical flow of fluid through the *pipeline system* (3.18(3.19))

~~3.93.8~~ **3.8**

HIPPS

high integrity pressure protection system

mechanical overpressure protection system that rapidly isolates the *pipeline* (3.17) if there is a *risk* (3.21(3.24)) of exceeding the *maximum allowable operating pressure (MAOP)* (3.11(3.14))

~~3.103.9~~ **3.9**

life extension

additional period beyond the original *service life* (3.23(3.23)) for which the *pipeline system* (3.18(3.19)) can be operated safely

Note 1 to entry: Life extension is considered as a modification to the design premise.

~~3.113.10~~ **3.10**

location class

geographic area classified according to criteria based on population density and human activity

[SOURCE: ISO 13623:2017, 3.1.10]

3.123.11 **3.11**

maximum allowable operating pressure

MAOP

maximum pressure at which the *pipeline system* (3.18(3.18)), or parts thereof, is allowed to be operated

[SOURCE: ISO 13623:2017, 3.1.12, modified — "maximum internal pressure" has been replaced by "maximum pressure"; "in compliance with this document" has been removed; note 1 to entry has been removed.]

3.133.12 **3.12**

offshore pipeline

pipeline (3.17(3.17)) laid in maritime waters and estuaries seaward of the ordinary high-water mark

[SOURCE: ISO 13623:2017, 3.1.13]

3.143.13 **3.13**

onshore pipeline

pipeline (3.17(3.17)) laid on or in land, including lines laid under inland water courses, up to the ordinary high-water mark when connected to an *offshore pipeline* (3.12(3.12))

[SOURCE: ISO 13623:2017, 3.1.14 modified — the term has been changed from "on-land pipeline" to "onshore pipeline"; "up to the ordinary high-water mark when connected to an offshore pipeline" has been added.]

3.153.14 **3.14**

operation

activities involved with running and maintaining the *pipeline system* (3.18(3.18)) in accordance with the design premise

3.163.15 **3.15**

operator

party ultimately responsible for the *operation* (3.14(3.14)) and integrity of the *pipeline system* (3.18(3.18))

3.173.16 **3.16**

PIMS

pipeline integrity management system

management system designed to ensure the safe and efficient *operation* (3.14(3.14)) of a *pipeline system* (3.18(3.18)) in accordance with the design intent, by control of the physical condition of a *pipeline* (3.17), the operating conditions within the system and any changes made to the system

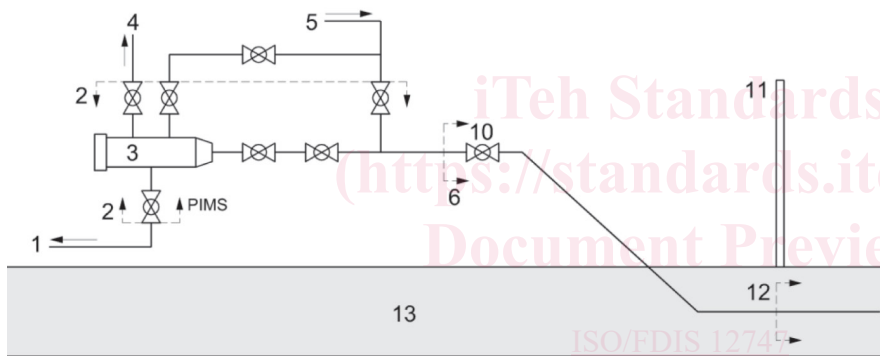
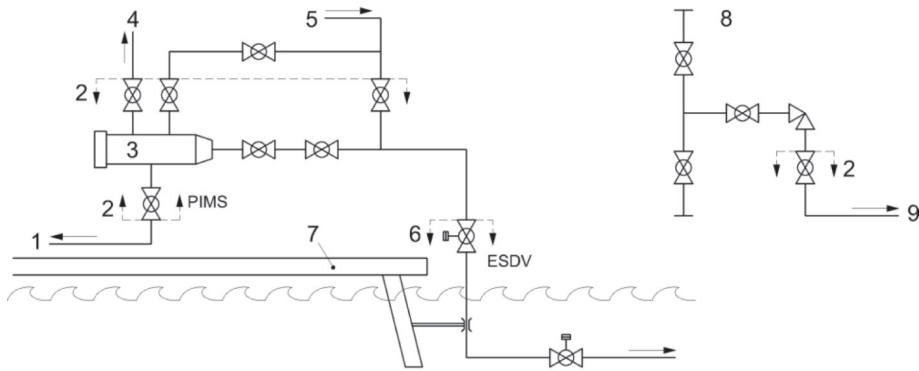
3.183.17 **3.17**

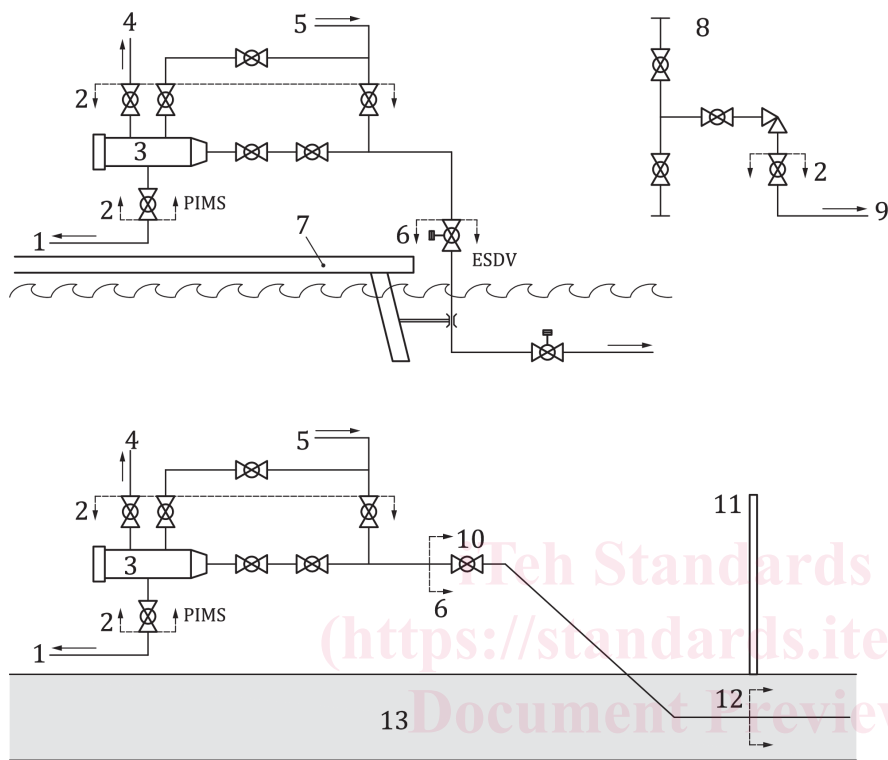
pipeline

facilities through which fluids are conveyed, including pipe, pig traps (where present), components and appurtenances, up to and including the isolating valves

Note 1 to entry: The definition of pipeline limits can vary by design standard, geographical region, and *operator* (3.15(3.15)) designation under the *pipeline integrity management system (PIMS)* (3.16). Examples of selected facilities are provided in [Figure 1](#).

ISO/ ~~DIS~~ **FDIS 12747:2024/2025(en)**





Key

1	drain	5	process	9	pipeline	13	onshore facility
2	pipeline limit	6	pipeline limit if there is no pig trap	10	isolation valve		
3	pig trap	7	offshore installation	11	fenceline		
4	vent	8	subsea xmas tree	12	pipeline limit if entering facility		

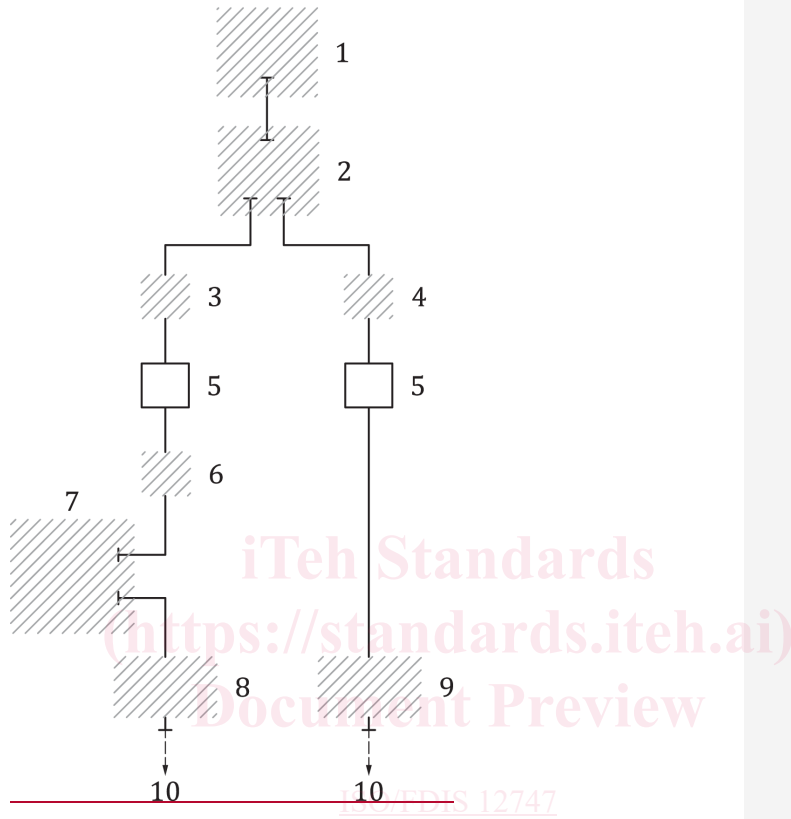
Figure 1 — Definition of pipeline limits at selected facilities

3.193.18 3.18

pipeline system

pipelines (3.17); stations, supervisory control and data acquisition system (SCADA), safety systems, corrosion protection systems, and any other equipment, facility or building used in the transportation of fluids

Note 1 to entry: The extent of the pipeline system covered by this document is defined in [Figure 2](#).



Key

- 1 [wellsite](#)
- 2 [gathering station, treatment plant or process plant](#)
- 3 [pump station](#)
- 4 [compressor station](#)
- 5 [valve station](#)
- 6 [tankage](#)
- 7 [refinery](#)
- 8 [depot](#)
- 9 [pressure-reduction station](#)
- 10 [DISTRIBUTION](#)

<https://standards.iteh.ai/catalog/standards/iso/0589373d-865b-48e7-8ed2-1ac07ac3b5e9/iso-fdis-12747>

ISO/~~DIS~~FDIS 12747:2024/2025(en)





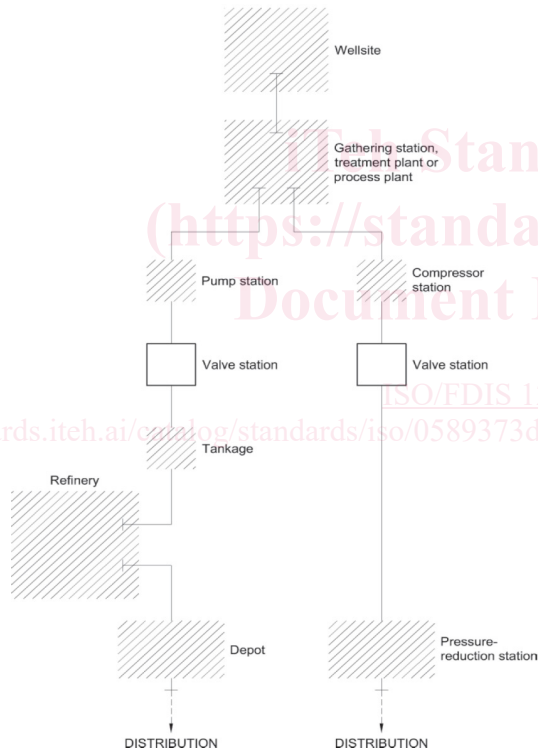
-  pipeline systems covered by this document
-  connection with other facilities
-  pipeline not covered by this document
-  station/plant area or offshore installation not covered by this document

Figure 2 — Extent of pipeline systems covered

[SOURCE: ISO 13623:2017, 3.1.16, modified — Note 1 to entry has been added.]



Key