International Standard

ISO 12747

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

First edition
2025-06

Reference number
ISO 12747:2025(en)

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Published in Switzerland

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Foreword

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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).

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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,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 12, *Oil and gas industries including lower carbon energy,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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

The main changes are as follows:

— 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 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 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.

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.

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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.

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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 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/

3.1
acceptance criteria
specified indicators or measures employed in assessing the ability of a component or system to perform its intended function

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