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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 46424-2025

**Failure analysis method for oil and gas transportation pipeline
girth welds**

油气输送管道环焊缝失效分析方法

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting. Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed and is under the jurisdiction of the National Technical Committee on Standardization of Petroleum and Natural Gas (SAC/TC355). This document was drafted by: China Oil & Gas Pipeline Network Corporation, and the Science and Technology Department of China Oil & Gas Pipeline Network Corporation. Research Institute Branch, China Special Equipment Inspection and Research Institute, Anke Engineering Technology Research Institute (Beijing) Co., Ltd., China National Petroleum Corporation Pipeline Dao Science Research

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1 Scope

GB/T 46424-2025 is the Chinese national standard covering working out why a girth weld failed - the site evidence and the sampling, the fractography and the metallography, the weld procedure and the misalignment reconstructed from the joint, the loads including ground movement, and the conclusion that has to hold up in an inquiry. At 21,500 words. Girth weld failures caused several of China's serious pipeline incidents. First edition, in force from 1 May 2026. Issued on 5 October 2025, it has been in force since 1 May 2026.

This document establishes the process for failure analysis of circumferential welds in steel pipelines used for onshore oil and gas transportation, and specifies the procedures for information collection and failure analysis scheme preparation. This includes review, on-site sampling and sample protection, testing and analysis, failure analysis conclusions and reports, and storage of failure analysis samples and remaining samples. This document applies to the failure analysis of circumferential welds in steel pipelines used for onshore oil and gas transportation.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 228.1 Metallic materials - Tensile testing - Part

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1 girthweld Circumferential welded butt joint of steel pipe.

Note. This includes the weld metal, fusion line, and heat-affected zone, also known as the weld joint.

3.2 failure The circumferential weld has lost or partially lost the functions specified in the original design, and is completely unable to serve, or can still serve but cannot operate safely and reliably. The state.

Note. Common failure modes of circumferential welds include plastic instability, corrosion, fatigue, and fracture.