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

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Technical specification for in-line inspection of steel pipeline

钢质管道内检测技术规范

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Foreword

This document is in accordance with the provisions of GB/T 1:1-2020 "Guidelines for Standardization Work Part 1: Structure and Drafting Rules for Standardization Documents" drafting: This document replaces GB/T 27699-2011 "Technical Specifications for Internal Inspection of Steel Pipelines": Compared with GB/T 27699-2011, except for structural In addition to adjustments and editorial changes, the main technical changes are as follows:

- a) The scope of application has been changed (see Chapter 1, Chapter 1 of the:2011 edition);
- b) Added the terms "centerline detection", "detection threshold", "reporting threshold" and "strain" (see 3:4, 3:10, 3:11, 3:25), and deleted the term "Simulator" and "verification" (see 3:13 and 3:17 of the:2011 edition), and the definitions of the terms "credibility" and "pipeline characteristics" have been changed (see 3:15, 3:16, 3:7, 3:16 of the:2011 edition);
- c) The regulations for when the detected pipeline is equipped with automatic opening and closing function valves and check valves are added (see 4:4:2, 4:4:3);
- d) Changed the regulations on the operating pressure of the pipeline during the operation of the detector, and increased the operating temperature of the pipeline medium during the

operation of the detector: (see 4:8, 4:8 and 4:9 of the:2011 edition);

e) Added the general provisions for the geometric deformation detection of the tested pipeline before commissioning (see 4:9);

f) Added the conditions and basic requirements for the pull test calibration and the rules for the preparation of the pull test report (see 6:5:1, 6:5:3, 6:5:4);

g) The regulations on the buried depth of pipelines at marking points have been added, and the marking rules for key locations and special sections have been added (see 6:6);

h) Added general requirements for pipeline pigging (see 7:1);

i) Deleted the rules of "commissioning simulator" (see Chapter 9 of the:2011 edition);

j) Increased the requirements for marking and tracking during the operation of the detector (see 9:2:1);

k) Changed the inspection requirements for data integrity after receiving the detector and the processing requirements when the data integrity does not meet the requirements of this document (see 9:4:2, 9:4:3, 10:4:2, 10:4:3 of the:2011 edition);

l) The content of centerline detection and axial strain detection has been added (see Chapter 10 and Chapter 11);

m) Changed the statistical rules of sag and ellipticity in the "Geometric Deformation Detection Report", and added statistics and deformation distribution diagrams of folds and buckling The compilation rules (see 13:1:3, 12:1:3 of the:2011 edition);

1 Scope

GB/T 27699-2023 specifies in-line inspection of steel pipelines - the intelligent pig run that is the only way to see the wall of a buried line without digging it up. The run itself is a day's work; everything around it is the difficulty, because the line has to be cleaned first, the pig has to pass every bend, tee and valve without lodging, and the data that comes back has to be turned into a defect list a pipeline engineer can act on, with the errors of the tool stated honestly. The standard sets the general requirements, the inspection interval and the selection of the tool, the preparation for the run, the cleaning pigging beforehand, then geometric deformation detection, metal loss detection, centreline detection and axial strain detection, the pre-processing of the data, the inspection report and the field verification of the reported features. It took effect on 23 May 2023.

This document stipulates the requirements for implementing internal inspection of steel pipelines, internal inspection cycle and equipment selection, inspection construction preparation, pigging before inspection, several The technical requirements for any deformation detection, metal loss detection, center line detection and axial strain detection, preprocessing of detection data, detection report, detection Provisions are made for

verification of test results, occupational health, safety, environment and delivery data: This document is applicable to the detection in onshore steel pipelines where the conveying medium is gas and liquid, and the detection in subsea steel pipelines where the conveying medium is gas and liquid In-pipeline testing can be performed with reference to this document:

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text: Among them, dated references For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to this document: SY/T 5536 Crude oil pipeline operation specification SY/T 5922 Operation Specifications for Natural Gas Pipelines

3 Terms and Definitions

The following terms and definitions apply to this document: 3:

1 In-line inspection in-line inspection; ILI The detection is done by a detector running in the pipeline that can collect and record pipeline information in real time: 3:

2 Geometry deformation detection geometry inspection The in-pipe inspection is implemented for the purpose of detecting the geometric deformation of the pipe: 3:

3 Metal loss detection metalloss inspection In-pipeline inspection for the purpose of detecting metal loss in the pipe wall: 3:

4 Centerline detection centerlineinspection Utilize the inertial detection unit mounted on the internal detector, combined with ground marking and coordinate measurement of marking points, the pipeline can be generated through data analysis Elevation, plane coordinates: 3:5 calibration calibrate Test and adjust the mechanical performance and detection performance of the detection equipment: 3:

6 Pigging Use equipment that can operate in the pipeline to clean up impurities, scale and wax condensation in the pipeline: