

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

SY/T 6151-2009

**Assessment of corroded steel pipelines
(English Translation)**

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Table of Contents

Foreword...	3
1 Scope...	4
2 Normative references...	4
3 Requirements for assessment personnel...	4
4 Raw data preparation before assessment...	5
5 Corrosion area measurement...	5
5.1 Measurement method...	5
5.2 Corrosion-pit depth measurement...	5
5.3 Longitudinal length measurement...	5
5.4 Circumferential length measurement...	5
6 Pipe corrosion damage assessment category-classification...	6
7 Pipe corrosion damage size assessment method...	6
7.1 Assessment based on corrosion-pit's relative depth...	6
7.2 Assessment based on corrosion-pit's longitudinal length...	7
7.3 Effect of circumferential corrosion scale...	7
8 Maximum safe operating pressure assessment method...	8
8.1 Maximum safe operating pressure calculation...	9
8.2 Assessment of corrosion damage category...	9
8.3 Overall assessment process...	10
Appendix A...	11
Appendix B...	14

Foreword

Pipeline corrosion damage causes the pipe body to form various shape and size defects. Serious defects can lead to pressure pipeline leak or rupture accident, which impacts the safe and smooth operation of pipeline. Therefore, as for the damaged pipeline, proposing a scientific assessment method has become a pressing need for the pipeline industry.

This Standard replaces SY/T 6151-1995 "Assessment of corroded steel pipelines".

Compared with SY/T 6151-1995, the main changes are as follows.

- MODIFY the corrosion damage assessment category content (Chapter 6 of this edition);
- USE Rstreng's yield strength calculation equation to replace the yield strength calculation equation under ASME B31G-1991 which is referenced in SY/T 6151-1995 (Clause 8.1 of this edition);
- MODIFY the assessment threshold of corrosion damage category (Clause 8.2 of this edition).

The Appendix A and B of this Standard are normative.

This Standard was proposed by and shall be under the jurisdiction of Gas Storage and Transportation Standardization Technical Committee.

The drafting organizations of this Standard. China National Petroleum Pipeline Company Limited (including the original Northeast Oil Transportation Authority), Chinese Academy of Sciences Institute of Metal Research.

Main drafters of this Standard. Chen Jianfeng, Han Enhou, Zhang Huabing, Feng Qingshan, Yu Jingchun, Li Shaozhong, Zhang Bo, Ke Wei, Wang Xueli, Song Hancheng, Wang Fuxiang.

This Standard replaces the previous standard as follows.

- SY/T 6151-1995.

Assessment of corroded steel pipelines

1 Scope

This Standard specifies the method for assessment of corrosion damage of in service pipeline.

This Standard applies to the assessment of blunt, low stress concentration corrosion damage carbon steel and low alloy steel pipeline. The assessment of pipeline's blunt mechanical damage can be conducted in accordance with this Standard.

This Standard does not apply to the assessment of the steel pipeline which is

before installation or in installation process, or the assessment of the steel pipelines which have serious defects in weld and heat affected zone.

This Standard applies only to the internal pressure bearing pipeline; when the pipeline is withstanding a big additional stress, it shall be considered separately.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrigendum) or revisions do not apply to this Standard, however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable.

For undated references, the latest edition of the referenced document applies.

GB/T 228 Metallic materials - Tensile testing at ambient temperature

GB/T 21143 Metallic materials - Unified method of test for determination of quasi-static fracture toughness

SY/T 6597 Technical standard of intelligent pigging on steel pipeline

3 Requirements for assessment personnel

Assessment personnel shall have the following basic knowledge and abilities.

- a) Pipeline work principles and safe operation precautions.
- b) Basic knowledge on material corrosion and mechanical properties.
- c) Identification and measurement of field corrosion state.

4 Raw data preparation before assessment

Raw data shall include the following.

- a) Pipeline diameter, wall thickness, material, mechanical properties AND manufacturers.
- b) Transmission medium, working pressure, temperature, AND the latest pressure test conditions.
- c) Corrosion environment and corrosion protection conditions.

d) Pipeline operating history, such as pipe age, leak history, AND larger maintenance and repair works, etc.

5.1.1 As for corrosion defects, the intelligent internal detection can be used, which is detailed in SY/T 6597.

5.1.2 As for corrosion defects, it is also allowed to use the external detection method such as calipers, straight ruler, tape measure, ultrasonic thickness gauge AND other measuring instruments (such as pitting measuring gauge).

5.2 Corrosion-pit depth measurement

Accurately MEASURE corrosion-pit depth; as for the corrosion-pits which are connected into a piece, MEASURE the depth of the deepest part.

5.3.1 MEASURE each corrosion-pit's longitudinal (in the direction of the pipe axis) maximum projected length.

5.3.2 MEASURE the total length of the same corrosion-pit which is determined in accordance with the detailed rules of Clause 7.2.3.

5.4.1 MEASURE each corrosion-pit's maximum projected length along the

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