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**Carbon dioxide capture, transportation and geological storage -
Pipeline transportation systems**

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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 is modified to adopt ISO 27913:2016 "Carbon dioxide capture, transportation and geological storage pipeline transportation system":

Compared with ISO 27913:2016, this document has made the following structural adjustments:

--- Added 7:3:1;

---7:3:2 corresponds to 7:3:1 in ISO 27913:2016;

---7:3:5 corresponds to part of the content in 7:3:7 of ISO 27913:2016;

--- Deleted 7:3:5 and 7:3:6 in ISO 27913:2016;

--- Added 7:4;

---7:5:1~7:5:2 corresponds to 7:4:1~7:4:2 in ISO 27913:2016;

--- Deleted 7:4:3 in ISO 27913:2016;

---7:5:3 corresponds to 7:4:4 in ISO 27913:2016:

The technical differences between this document and ISO 27913:2016 and their reasons are as follows:

--- Replaced ISO 3183:2012 (see 7:2:1 and 7:4:3) with the normative reference GB/T 9711 to adapt to the standard system of our country

Require;

--- Deleted the terms "arrest pressure", "critical point", "flow coating", "inside coating", "maximum design temperature" and "maximum operating temperature" that did not appear in this document

Pressure", "minimum operating pressure" and "triple point" (see Chapter 3 of ISO 27913:2016);

---Change the term "lining" (see 3:13 of ISO 27913:2016) to "inner coating pipe" (see 3:9) to facilitate understanding of 6:9:7

content requested;

--- Deleted the symbols "CV", "ccf", "AC", "sigmaa", "PS" and "OD" that do not appear in this document (see 4:1 of ISO 27913:2016);

--- The symbols "RCVN", "tminDP", "tminHS" and "P" (see 4:1) have been added to facilitate the calculation of the symbols for the minimum wall thickness and fracture toughness of pipes;

--- Deleted the abbreviations "PIG" and "SI" that do not appear in this document (see 4:2 of ISO 27913:2016);

--- Added abbreviations "BTC", "CVN", "QT" and "TMCP" (see 4:2) to facilitate understanding and calculation of pipeline fracture toughness;

--- Increased the classification of pipeline transport fluid and clarified that CO₂ is a type E fluid (see 6:2): The classification of CO₂ is an important part of CO₂ transport pipeline

To design parameters;

--- Increased the main considerations of the impurity content in CO₂ (see 6:3), the physical and chemical properties of CO₂ and the impurity content

The phase state has an important influence, thereby affecting the design parameters of the CO₂ pipeline;

--- Added the requirement that the wall thickness calculation is mainly determined by the internal pressure criterion, and deleted the minimum wall thickness calculation method considering ductile fracture (see

7:3), unified with the current general wall thickness calculation method;

--- Increased and refined the relevant requirements for fracture control (see 7:4), fracture control is an important factor in determining the safe operation of CO₂ transmission pipelines

aspects, and differ from hydrocarbon pipelines;

The following editorial changes have been made to this document:

--- Replaced ISO 13623, EN1594 and AS2885 with informative references to GB/T 24259 (see 6:2);

--- Added non-metallic materials resistance to rapid gas decompression and carbon dioxide

chemical compatibility test methods (see 7:2:3), which is convenient for development

Compatibility evaluation tests for relevant non-metallic materials;

--- Increased the informative reference of GB 50251 (see 7:3:3);

--- Changed the volume composition unit (see Appendix A);

--- Increased the description that the pipeline contains free water, and generally does not use chemical additives to control internal corrosion (see C:3), add

Addition of chemical additives to control internal corrosion can have other adverse effects on pipelines;

--- Changed the content of Appendix D to facilitate the calculation of pipeline crack arrest toughness:

Please note that some contents of this document may refer to patents: The issuing agency of this document assumes no responsibility for identifying patents:

1 Scope

This document specifies the requirements and recommended practices for the safe and reliable design, construction and operation of carbon dioxide stream transmission pipelines: This article

The document also stipulates the medium properties of the carbon dioxide flow, and the health, safety and environmental aspects related to carbon dioxide delivery and monitoring:

This document applies to:

--- Rigid metal piping;

--- Pipeline system;

--- Onshore and offshore pipelines for transporting carbon dioxide streams;

--- The carbon dioxide flow transmission pipeline for the transformation of the existing pipeline;

--- Pipeline transportation of carbon dioxide stream for storage or utilization;

--- Carbon dioxide transported in gas phase and dense phase:

The system boundary node between capture and delivery is located at the pipeline inlet valve, as shown in Fig: 1: In order to meet the delivery requirements described in this document

It is required that the composition, temperature and pressure of the carbon dioxide stream be controlled within specified limits by the capture process or process:

The system boundary node between transmission and storage is where the CO₂ stream exits the transmission pipeline and enters the storage infrastructure:

Description of index number:

1 --- CO₂ from capture points, such as from power plants and other

other factories, etc.;

9 --- Used for enhanced oil recovery (EOR) facilities;

10---Standpipe (not included in the delivery system);

11---submarine valve (included in the delivery system);

12---beach valve;

13---offshore pipeline;

14---onshore pipeline;

15---valve;

16---coast;

17 --- open water;

18---Third party delivery system;

19---Exports other than those used in 7, 8, and 9;

20---Intermediate supercharging device:

Figure 1 System boundary diagram to which this document applies