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Carbon dioxide capture, transportation and geological storage — Pipeline transportation systems

Captage du dioxyde de carbone, transport et stockage géologique — Systèmes de transport par conduites

Reference number
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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 documents 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 on 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 the following URL: www.iso.org/iso/foreword.html.

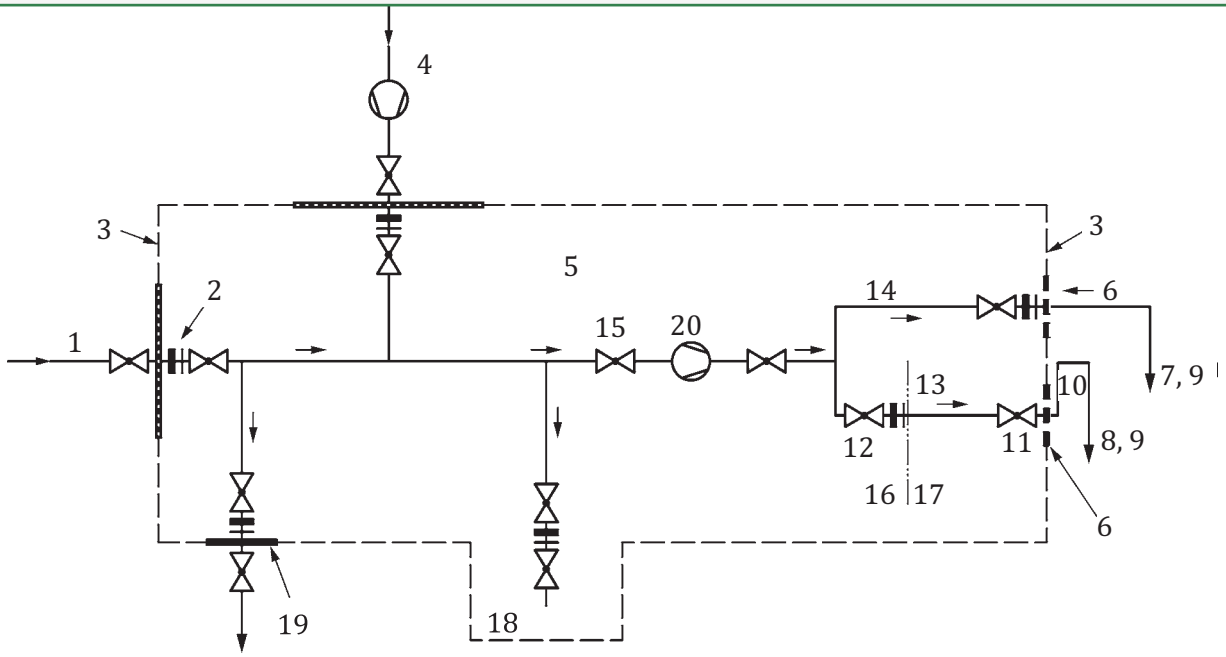
The committee responsible for this document is ISO/TC 265, *Carbon dioxide capture, transportation, and geological storage*.

Introduction

Carbon dioxide (CO_2) capture and storage (CCS) has been identified as a key abatement technology for achieving a significant reduction in CO_2 emissions to the atmosphere. Pipelines are likely to be the primary means of transporting CO_2 from the point-of-capture to storage (e.g. depleted hydrocarbon formations, deep saline aquifers), where it will be retained permanently or used for other purposes [e.g. Enhanced Oil Recovery (EOR)] to avoid its release to the atmosphere. While there is a perception that transporting CO_2 via pipelines does not represent a significant barrier to implementing large-scale CCS, there is significantly less industry experience than there is for hydrocarbon service (e.g. natural gas) and there are a number of issues that need to be adequately understood and the associated risks effectively managed to ensure safe transport of CO_2. In a CCS context, there could be a need for larger CO_2 pipeline systems in more densely populated areas and with CO_2 coming from multiple sources. Also, offshore pipelines for the transportation of CO_2 to offshore storage sites are likely to become common.

The objective of this document is to provide requirements and recommendations on certain aspects of safe and reliable design, construction and operation of pipelines intended for the large scale transportation of CO_2 that are not already covered in existing pipeline standards such as ISO 13623, ASME B31.4, EN 1594, AS 2885 or other standards (see Bibliography). Existing pipeline standards cover many of the issues related to the design and construction of CO_2 pipelines; however, there are some CO_2 specific issues that are not adequately covered in these standards. The purpose of this document is to cover these issues consistently. Hence, this document is not a standalone standard, but is written to be a supplement to other existing pipeline standards for natural gas or liquids for both onshore and offshore pipelines.

Transport of CO_2 via ship, rail and road is not covered in this document.



Key

1	source of CO_2 from capture, e.g. from power plant, industry; see ISO/TR 27912 (capture)	10	riser (out of transport scope)
2	isolating joint	11	subsea valve (inside transport scope)
3	boundary limit	12	beach valve
4	other source of CO_2	13	offshore pipeline
5	ISO 27913 (transportation system inside)	14	onshore pipeline
6	boundary to storage facility	15	valve
7	onshore storage facility	16	landfall
8	offshore storage facility	17	open water/sea
9	EOR	18	third party transport system
		19	export to other uses than 7, 8 and 9
		20	intermediate compression or pumping

Figure 1 — Schematic illustration of the system boundaries of this document