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Infrastruktura za plin - Sistem za varno obvladovanje prenosne infrastrukture za plin in sistem celostnega obvladovanja prenosnega sistema za plin - Funkcionalne zahteve

Gas infrastructure - Safety Management System (SMS) for gas transmission infrastructure and Pipeline Integrity Management System (PIMS) for gas transmission pipelines - Functional requirements

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Gasinfrastruktur - Sicherheitsmanagementsystem (SMS) für die Gastransportinfrastruktur und Rohrleitungsintegritätsmanagementsystem (PIMS) für Gastransportleitungen - Funktionale Anforderungen

Infrastructures gazières - Système de management de la sécurité (SMS) pour infrastructures de transport de gaz et système de management de l'intégrité des canalisations (PIMS) pour canalisations de transport de gaz - Exigences fonctionnelles

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This European Standard was approved by CEN on 8 May 2013.

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Foreword

This document (EN 16348:2013) has been prepared by Technical Committee CEN/TC 234 "Gas infrastructure", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2013, and conflicting national standards shall be withdrawn at the latest by December 2013.

This document supersedes CEN/TS 15173:2006 and CEN/TS 15174:2006.

This European standard has been drafted by merging the contents of the CEN/TS 15173 "Gas supply systems – Frame of reference regarding pipeline integrity management system (PIMS)" and CEN/TS 15174 "Gas supply systems – Guidelines for safety management systems for natural gas transmission pipelines". It aims to be a frame of reference for a transmission system operator (TSO) to develop and maintain a management system for ensuring a safe and reliable gas transmission infrastructure.

This standard presents all the activities to be carried out to implement a safety management system (SMS) covering the complete TSO's infrastructure. A section is specifically dedicated to the integrity management of transmission pipelines.

This standard is based on the state of the art management and maintenance practices of TSOs as these have proved historically to maintain high levels of safety, including improvements.

The structure adopted by this standard follows the structure implemented by the standard EN ISO 14001. This standard requires the TSO to develop and implement a management system for the safety and the reliability of a gas transmission infrastructure with the same basic principle: plan, do, check and act (PDCA).

Two main goals have been identified to achieve this principle. These are to have:

- a management system specific for the gas transmission infrastructure activity, but aligned with the most recognised standards for management systems;
- the possibility to integrate the SMS with other systems used in the organisation where they already exist.

All assets within a gas transmission system require an integrity management system to ensure the safe and reliable operation of the infrastructure. The section on Pipeline Integrity Management System (PIMS) within this document (Clause 5) addresses specific issues related to maintaining the integrity of the gas transmission pipelines. The reason for having a PIMS is to manage the safety aspects associated with operating underground transmission pipelines, which can be located in an open environment where the public can access the pipeline route.

This standard describes the resources, information systems and technical and organisational activities, for which the TSO is responsible and which are needed to prevent incidents and mitigate their consequences.

These resources and activities are implemented according to the technical and economic requirements specific to each TSO.

Through this SMS, the TSO and its stakeholders are ensured of a safe gas transmission infrastructure. The SMS enables the transmission system operator to comply with its policy and

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objectives to manage safety aspects. The policy and the objectives take into account legal requirements and other requirements to which TSO subscribes.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies requirements which enable a Transmission System Operator (TSO) to develop and implement a safety management system including an integrity management system specifically for pipelines.

The SMS is applicable to infrastructure for the transmission of processed, non-toxic and non-corrosive natural gas according to EN ISO 13686 and injected bio methane, where:

- the pipeline elements are made of unalloyed or low-alloyed carbon steel;
- the pipeline elements are joined by welds, flanges or mechanical joints.

NOTE 1 In this standard, the term “natural gas” includes injected bio methane or other non-conventional forms of natural gas, e.g. shale gas.

Gas infrastructures for the transmission of natural gas covered by this standard are:

- pipelines onshore including valve stations;
- compressor stations;
- measuring and pressure reduction stations.

Gas distribution assets as well as LNG plants, terminals, underground storages are excluded from the scope of this standard.

Occupational health and safety is excluded from this European standard because it is covered by national legislation and other European and/or international standards, e.g. OHSAS 18001.

This European standard specifies requirements on a general level. The referenced documents given in Clause 2 “Normative references” give more detailed requirements for some of the assets listed above.

This European Standard is intended to be applied in association with these national standards and/or codes of practice setting out the above-mentioned basic principles.

In the event of conflicts in terms of more restrictive requirements in national legislation/regulation with the requirements of this standard, the national legislation/regulation takes precedence as illustrated in CEN/TR 13737 (all parts).

NOTE 2 CEN/TR 13737 (all parts) contains:

- clarification of relevant legislation/regulations applicable in a country;
- if appropriate, more restrictive national requirements;
- national contact point for the latest information.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1594, *Gas supply systems - Pipelines for maximum operating pressure over 16 bar - Functional requirements*

EN ISO 13686, *Natural gas - Quality designation (ISO 13686)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

transmission system operator TSO

natural or legal person who carries out the function of transmission and is responsible for operating, ensuring the maintenance of, and, if necessary, developing the transmission system in a given area and, where applicable, its interconnections with other systems, and for ensuring the long-term ability of the system to meet reasonable demands for the transport of gas

Note 1 to entry This definition is identical with that given in the EU Directive on the common gas market 2009/73/EU.

3.2

inspection

the process of measuring, examining, testing, gauging or otherwise determining the status of items of the pipeline system or installation and comparing it with the applicable requirements

Note 1 to entry This definition is identical with that given in EN 1594.

3.3

maintenance

combination of all technical and associated administrative actions intended to keep an item in, or restore it to, a state in which it can perform its required function

Note 1 to entry This definition is identical with that given in EN 1594.

3.4

operation

activities to control the gas flow through operation of compressors, regulators, valves, etc. under the conditions that gas pressure, gas quality and gas temperature (safety) limits set by the operator and/or standards are not exceeded

EN 16348:2013 (E)**3.5****safety**

the condition of the gas infrastructure being acceptable for the population, for the environment and for the continuity of supply ensured by the adoption of adequate measures in the design, construction, operation and maintenance of the gas infrastructure

Note 1 to entry The definition of the level of acceptability is in the responsibility of the stakeholders of a specific gas transmission system e.g. authorities, TSO.

3.6**safety aspect**

element or event that, if not properly managed, can cause a potential hazard for the population, the environment and for the gas infrastructure

3.7**safety management system****SMS**

set of appropriate activities and practices by which a transmission system operator preserves a safe and reliable gas transmission system and mitigates the consequences of incidents

Note 1 to entry The pipeline integrity management (PIMS) is an integral part of the safety management system.

3.8**pipeline integrity**

condition of the gas transmission pipeline to ensure safe and reliable transportation of natural gas

3.9**pipeline integrity management system****PIMS**

set of appropriate activities and practices by which a transmission system operator preserves the integrity of the gas transmission pipeline to ensure safe and reliable transportation of natural gas

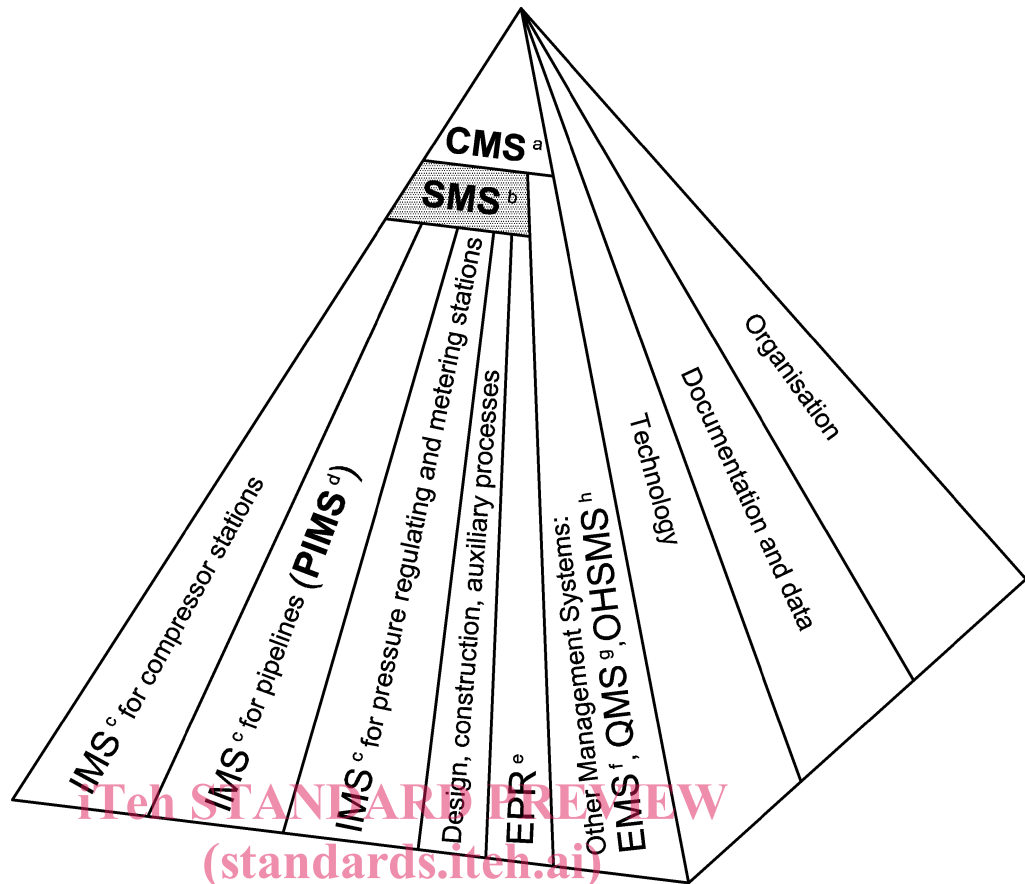
4 Safety management system (SMS)**4.1 General requirements**

The SMS shall ensure:

- the safety of the public;
- the protection of urban, natural or industrial environment;
- the service life and reliability of natural gas infrastructure.

The safety management system is an essential part of the company management system see Figure 1. The SMS described in this standard is designed in accordance with the structure and the general principles of EN ISO 14001 and OHSAS 18001.

The alignment of the SMS structure with the structure of EN ISO 14001 and OHSAS 18001 helps the integration with other management systems adopted by the TSO such as for quality, environment, occupational health and safety.



Key

- a – CMS - Company Management System
 b – SMS - Safety Management System (for gas transmission infrastructure)
 c – IMS - Integrity Management System
 d – PIMS - Pipeline Integrity Management System (see Clause 5)
 e – EPR - Emergency Preparedness and Response Procedure (see 4.4.7)
 f – EMS - Environment Management System
 g – QMS - Quality Management System
 h – OHSMS - Occupational Health and Safety Management System

Figure 1 — Example of architecture of a company management system of a TSO

The TSO shall establish, implement and maintain a safety management system for the gas infrastructure, by fulfilling the requirements specified in Clause 4.

The structure of the SMS shall follow the Deming cycle based on the principle of plan, do, check, act (PDCA). PDCA shall be applied to each of the life cycle stages of the gas transmission infrastructure:

- design;
- construction and commissioning;
- operation (including emergency management);
- maintenance;

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— permanently taken out of service.

The SMS shall consider and respond to the safety aspects of:

- a) the main processes which are the stages of the life cycle of a gas transmission infrastructure mentioned above. This enables the TSO to perform its primary tasks to achieve the required safety and reliability of the gas transmission infrastructure;
- b) the auxiliary processes which support the main processes in a proper and effective way and which comprises the following:
 - 1) training;
 - 2) purchasing;
 - 3) communication;
 - 4) documentation;
 - 5) monitoring developments in regulation and innovation.

NOTE The processes above are in accordance with TSO practice.

The SMS shall address the fundamental requirements for the safety and reliability of a gas transmission infrastructure to maintain the integrity of buried pipelines and pipelines outside fenced-off areas, as these areas are generally accessible by third party and public. For this purpose a pipeline integrity management system is described in detail in Clause 5 of this standard.

4.2 Management commitment and safety policy

The TSO top management shall provide visible and active leadership in developing and maintaining a culture that supports the management of safety.

The top management shall define a safety policy in which overall objectives and a commitment to maintain or improve safety performance are clearly stated.

The safety policy shall:

- a) be appropriate to the nature, scale and safety impacts of its activities;
- b) include commitments to:
 - 1) the prevention of incidents;
 - 2) ensure safe and reliable transportation of natural gas;
 - 3) the mitigation of consequences for the public, the environment and the transmission of gas;
- c) include a commitment to comply with relevant legislation and regulations, and with company requirements and commitments;
- d) provide the framework for setting and reviewing safety objectives and targets;
- e) be documented, implemented and maintained and communicated to all employees;

f) be made available to stakeholders.

4.3 Planning

4.3.1 Safety aspects

The TSO shall have a procedure to identify and list the safety aspects. The TSO shall document the safety aspects and keep them under review.

The TSO shall describe how these aspects are managed by the SMS through appropriate controls.

The safety aspects are usually similar for large parts of the infrastructure. In some cases, there are local safety aspects, which shall also be considered.

The TSO shall define the procedures, services and equipment that are safety critical for the management of the safety aspects.

4.3.2 Legal and other requirements

The TSO shall have a procedure to identify legal requirements and other requirements to which the TSO subscribes, that are applicable to the safety aspects of its activities.

The TSO shall ensure that these requirements are taken into account when establishing, implementing and maintaining its SMS.

4.3.3 Objectives, targets and programme

The TSO shall have documented safety objectives and targets that take into account the legal and other requirements, technological developments, operational and business requirements. These objectives and targets shall be consistent with the safety policy (see 4.2).

The targets shall be measurable.

The TSO shall have a programme for achieving its objectives and targets. The programme shall include as a minimum:

- designation of responsibility and authority for achieving objectives;
- the means and the time-frame by which the objectives are to be achieved.

The programme shall be reviewed on a regular basis and at planned intervals and adjusted when necessary.

4.4 Implementation and operation of the SMS

4.4.1 Structure, responsibility and resources

The TSO top management shall appoint specific management representatives who, irrespective of other responsibilities, shall have defined roles, responsibilities and authority for:

- ensuring that the safety management system is established, implemented and maintained in accordance with this standard;