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General characteristics of liquefied natural gas

液化天然气的一般特性

(English Translation)

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Foreword

This Standard is equivalent to CEN BS EN 1160.1997 "Installations and equipment for liquefied natural gas - General characteristics of liquefied natural gas".

In order to facilitate user access to the original text, the typesetting of this Standard is basically the same as the original text, and no changes have been made. In order to ensure the implementation of the standard, English (original text) annotations are given to the parts that are liable to confusion.

Regarding the unit of measurement, this Standard is mainly based on legal units of measurement, that is, the value of legal units of measurement precedes, and the corresponding value of non-statutory units of measurement is indicated in parentheses following it.

Annex A and Annex B of this Standard are informative annexes.

This Standard was proposed by China National Offshore Oil Corporation.

This Standard is under the jurisdiction of China Natural Gas Standardization Technology Committee.

Drafting organizations of this Standard. Development and Design Institute of CNOOC Research Center, Natural Gas Research Institute of PetroChina Southwest Oil & Gasfield Branch Company, East China Investigation and Design Institute of China National Petroleum Corporation, Zhongyuan Oilfield Branch Company of China Petroleum & Chemical Corporation.

Main drafters of this Standard. Fu Yuhua, Zhang Bangying, Xu Xiaoming, Wu Ying, Luo Qin.

General characteristics of liquefied natural gas

1 Scope

This Standard gives guidance on the characteristics of liquefied natural gas (LNG) and the cryogenic materials used in the LNG industry. This Standard also gives guidance on health and safety matters. This Standard is intended to act as a reference document for the implementation of other standards of CEN/TC

282 (Installations and equipment for liquefied natural gas). This Standard is

intended as a reference for use by persons who design or operate LNG facilities.

2 Normative references

The following documents contain the provisions which, through reference in this Standard, become the provisions of this Standard. For dated references, their subsequent amendments (excluding corrigendum) or revisions do not apply to this Standard. However, the parties who enter into agreement based on this Standard are encouraged to investigate whether the latest versions of these documents are applicable. For undated reference documents, the latest versions apply to this Standard.

EN 1473 Installation and equipment for liquefied natural gas - Design of on-shore installation.

3 Term and definition

For the purposes of this Standard, the following term and definition apply.

liquefied natural gas

A colorless fluid in the liquid state composed predominantly of methane and which may contain minor quantities of ethane, propane, nitrogen or other components normally found in natural gas.

4 Abbreviations

For the purposes of this Standard, the following abbreviations apply.

- LNG liquefied natural gas;
- RPT rapid phase transition;
- BLEVE boiling liquid expanding vapor explosion;
- SEP surface emissive power.

5.1 Introduction

It is recommended that all personnel concerned with the handling of LNG should be familiar with both the characteristics of the liquid and the gas produced. The potential hazard in handling LNG stems mainly from three important properties.

- a) LNG is extremely cold. At atmospheric pressure, depending upon composition, it boils at about -160 °C. At this temperature the vapor is more dense than ambient air (see examples in Table 1);
- b) very small quantities of LNG liquid are converted into large volumes of gas. One volume of LNG produces approximately 600 volumes of gas (see examples in Table 1);
- c) natural gas, similar to other gaseous hydrocarbons, is flammable. At ambient conditions the flammable mixture range with air is from approximately 5 % to 15 % gas by volume.

5.2.1 Composition

LNG is a mixture of hydrocarbons composed predominantly of methane and which can contain minor quantities of ethane, propane, nitrogen or other components normally found in natural gas.

The physical and thermodynamic properties of methane and other components of natural gas can be found in reference books (see Annex A) and thermodynamic calculation codes.

For the purpose of this Standard, LNG shall have a methane content of more than 75 % and a nitrogen content of less than 5 %.

Although the major constituent of LNG is methane, it shall not be assumed that LNG is pure methane for the purpose of estimating its behavior.

When analyzing the composition of LNG special care shall be taken to obtain representative samples not causing false analysis results due to distillation

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