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

GB/T 24959-2019

**Refrigerated light hydrocarbon fluids - General requirements
for temperature measurement system in cargo tanks of LNG
carrier**

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard replaces GB/T 24959-2010 "Measurement resistance thermometer and thermoelectricity of frozen light hydrocarbon fluid liquefied gas storage tank

I". Compared with GB/T 24959-2010, the main technical changes in this standard are as follows.

- Revised the standard name "General requirements for temperature measurement systems in the cargo tank of frozen light hydrocarbon fluid LNG carriers";
- Added four terms for cargo compartment automatic thermometer, shipboard custody transfer system, indicating device, platinum resistance temperature sensor (see 3.1, 3.4, 3.5 and 3.6);
- Revised the definition of the term "temperature measurement system" (see 3.7, 3.1 of.2010 edition);
- Removed the temperature detector type (see Chapter 4 of the.2010 edition);
- Added security protection measures (see Chapter 4);
- Increased performance requirements (see Chapter 5);
- Modified the temperature sensor calibration method (see 6.1.1.2, version 9.1.1 of.2010);
- Increased the accuracy requirements for temperature platinum resistance (see 6.1.1.3);
- Increased the accuracy requirements of the indicating device (see 6.1.2.2);
- Increased test requirements and methods for temperature measurement systems after installation (see 6.2);
- Revised the accuracy requirements of the temperature measurement system (see Chapter 9,.2010. 5.1.1).

This standard uses the redrafting method to modify the use of ISO 8310.2012 "Frozen hydrocarbons and non-petroleum based liquefied gas fuel shipping and solid

General requirements for automatic tank thermometers on large mooring tankers.

This standard has more structural adjustments than ISO 8310.2012. Appendix A lists this standard and ISO 8310.2012.

The chapter number is compared to the list.

The technical differences between this standard and ISO 8310.2012 and their reasons are as follows.

--- Regarding the normative reference documents, this standard has been adjusted with technical differences to adapt to China's technical conditions and adjustments.

It is concentrated in Chapter 2, "Regulatory References", and the specific adjustments are as follows.

* Added references to GB 3836.1, GB 3836.2, GB 3836.3, GB 3836.4, GB/T 3836.5, GB/T 3836.6,

GB/T 3836.7, GB/T 3836.11, GB 3836.14, GB/T 3836.24, GB/T 5332, GB/T 10250,

GB/T 16839.1, GB/T 16839.2, GB/T 17214.1, GB/T 17214.2, GB/T 28561, IGCCODE;

* Replace IEC 60751 with GB/T 30121 equivalent to the international standard;

--- Removed tank automatic level gauge, automatic tank level measurement system, inherent error, nominal resistance, nominal PRT temperature/resistance

Relationship, uncertainty, a total of 6 general terms, general terms are not given in this standard;

--- Increased the safety aspects of the term "gas hazard area" to meet the requirements of China's ship cargo warehouse safety (see 3.2);

--- Increase insulation resistance to meet the requirements of China's use of temperature sensors (see 5.13);

--- Increased environmental and power supply allowable fluctuations to meet the requirements of China's resistance thermometers and thermocouples (see 5.14).

This standard has made the following editorial changes.

--- Revised the standard name "General requirements for temperature measurement systems in cargo tanks of frozen light hydrocarbon fluid LNG carriers".

--- Deleted informative Appendix A.

This standard is proposed and managed by the National Oil and Gas Standardization Technical Committee (SAC/TC355).

This standard was drafted. China National Petroleum Corporation Southwest Oil and Gas

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Natural Gas Co., Ltd.

1 Scope

This standard specifies the basic requirements for a temperature measurement system for the measurement of clinker trade in ships.

This standard applies to the operation and maintenance of temperature measurement systems used in cargo tanks on LNG carriers.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB 3836.1 Explosive atmosphere - Part 1. General requirements for equipment (GB 3836.1-2010, IEC 60079-0:2007, MOD)

Explosive atmospheres - Part 2. Equipment protected by flameproof enclosure "d" (GB 3836.2-2010, IEC 60079-1:2007, MOD)

GB 3836.3 Explosive atmosphere - Part 3. Equipment protected by an increased safety "e" (GB 3836.3-2010, IEC 60079-7:2006, IDT)

Explosive atmospheres - Part 4. Equipment protected by intrinsically safe "i" (GB 3836.4-2010, IEC 60079-11:2006, MOD)

GB/T 3836.5 Explosive atmosphere - Part 5. Equipment protected by a positive pressure enclosure "p" (GB/T 3836.5-2017, IEC 60079-2:2007, MOD)

GB/T 3836.6 Explosive atmosphere - Part 6. Equipment protected by liquid immersion "o" (GB/T 3836.6-2017,

IEC 60079-6.2015, MOD)

GB/T 3836.7 Explosive atmosphere - Part 7. Equipment protected by sand-filled "q" (GB/T 3836.7-2017,

IEC 60079-5.2015, MOD)

GB/T 3836.11 Explosive atmospheres - Part 11. Methods and data for the classification of gas and vapour properties

(GB/T 3836.11-2017, IEC 60079-20-1.2010, IDT)

GB 3836.14 Explosive atmospheres - Part 14. Classification of explosive atmospheres (GB 3836.14-2014,

IEC 60079-10-1.2008, IDT)

GB/T 3836.24 Explosive atmosphere - Part 24. Equipment protected by special type "s" (GB/T 3836.24-2017,

IEC 60079-33.2012, MOD)

GB/T 5332 Test method for ignition temperature of flammable liquids and gases (GB/T 5332-2007, IEC 60079-4. 1975, IDT)

GB/T 10250 Electromagnetic compatibility of marine electrical and electronic equipment (GB/T 10250-2007, IEC 60533.1999, IDT)

GB/T 16839.1 Thermocouple Part 1. Electromotive force specifications and tolerances (GB/T 16839.1-2018, IEC 60584-1.

2013, IDT)

GB/T 16839.2 Thermocouples Part 2. Tolerances (GB/T 16839.2-1997, IEC 60584-2. 1982, IDT)

GB/T 17214.1 Industrial process measurement and control devices - Working conditions - Part 1 . climatic conditions (GB/T 17214.1-1998,

IEC 60654-1.1993, IDT)

GB/T 17214.2 Working conditions of industrial process measuring and control devices - Part 2. Power (GB/T 17214.2-2005,