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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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.

This document was prepared by ISO Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 3, *Piping and machinery*.

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Ships and marine technology — Safety valve for cargo tanks of LNG carriers — Design and testing requirements

1 Scope

This document specifies the requirements of design, test and inspection methods for diaphragm-type pilot operated safety valves, which are used in cargo tanks of LNG carriers in order to keep the pressure inside the tank below maximum allowable working pressure.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4126-4, *Safety devices for protection against excessive pressure — Part 4: Pilot operated safety valves*

IMO, *The International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code)*

API STD 527, *Seat Tightness of Pressure Relief Valves*

ASME B16.34, *Valves-Flanged, Threaded and Welding End*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
blowdown
difference between the set and reseating pressures

Note 1 to entry: Blowdown is normally stated as a percentage of set pressure, except for pressures of less than 3 bar, when the blowdown is expressed in bar.

3.2
flow area
cross-sectional area (but not the curtain area) between inlet and seat that is used to calculate the theoretical flow capacity of the main valve, with no deduction for any obstruction

3.3
lift
actual travel of the main valve disk away from the closed position

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3.4
pilot operated safety valve
automatic, self-actuated device comprising a main valve and an attached pilot valve

Note 1 to entry: The pilot responds to the pressure of the fluid without any other energy source than the fluid itself, and controls the operation of the main valve. The valve opens when the fluid pressure increases to the pilot valve set point. The valve re-closes when the fluid pressure is reduced to reseating pressure. See Figure 1.

3.5
reseating pressure
value of the inlet static pressure at which the disk re-establishes contact with the seat or at which the lift becomes zero

3.6
set pressure
tank pressure at which the main valve of a pilot operated safety valve under operating conditions begins to open

3.7
theoretical discharge capacity
calculated capacity expressed in mass or volumetric units of a theoretically perfect nozzle having a cross-sectional flow area equal to the flow area of a main valve

3.8
vacuum set
negative tank pressure value at which the valve starts to open under working conditions

4 Main valve components

4.1 Body

The body inlet is connected directly to the tank, and the exit is connected to a discharge pipe. It keeps the pressure contained and endures the reaction of pressurized fluid discharged from the system.

4.2 Nozzle

It jets out pressurized fluid to the discharge pipe.

4.3 Disk

It works with the seat to provide sealing function to prevent leakage when it is closed. It is in direct contact with the working fluid, and may be damaged part if the fluid contains solids or foreign material.

4.4 Cover

It is connected to the body and makes a pressure space where flow can occur.

4.5 Diaphragm

It is a main component assembled between the main valve body and the cover. It delivers the fluid pressure to the disk.

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