Guidelines No. T-17(202502)

T-17

Ship-shore Link System

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Foreword

The product inspection guideline of China Classification Society (hereinafter referred to as "CCS") specifies the applicable technical requirements and inspection and test requirements for classification products and authorized statutory products of ships to be approved/inspected by CCS.

The Guidelines allow users to adopt alternative test methods and requirements, provided they meet or exceed the standards set by the Guidelines.

The Guidelines are prepared and updated by CCS and published on http://www.ccs.org.cn. In case of any comments and suggestions, please contact CCS via service@ccs.org.cn.

Historical release version and release time: newly edited

Main modifications in this version: None

Contents

Ship-shore Link System

1 Scope of Application

1.1 The Guidelines are applicable to the shipborne part of the Ship-shore Link (SSL)-System installed on LNG carriers for transmitting communication and alarm signals between ships and shores when the ships berth at the wharf for loading and unloading operations, as well as the ship-ship link system used by LNG bunkering ships for bunkering LNG powered ships.

1.2 The ship-shore link system for bunkering of alternative fuels (natural gas, methanol, ammonia, etc.) shall refer to the applicable requirements of the Guidelines.

2 Normative References

(1) IGC CODE: International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk;

(2) CCS Rules for Construction and Equipment of Ships Carrying Liquefied Gases in Bulk;

(3) CCS Rules for Classification of Sea-Going Steel Ships;

(4) ISO 28460: Petroleum and natural gas industries — Installation and equipment for liquefied natural gas — Ship-to-shore interface and port operations;

(5) CCS Guidelines for Ships Using Methanol/Ethanol Fuel;

(6) CCS Guidelines for Methanol Bunkering Ships;

(7) CCS Guidelines for Ships Using Ammonia Fuel;

(8) CCS Rules for Natural Gas Fuel Used in Ships

3 Terms and Definitions

The terms and definitions defined in the above survey basis are applicable to the Guidelines. For the convenience of preparation and use, the following definitions are directly quoted or supplemented in the Guidelines.

3.1 Ship-shore link system: As a part of the emergency shutoff system (ESD), it is used to cut off the transmission of signals, data and voice communication between ships and shores.

3.2 Communication: including all transmission modes such as written or voice information and data exchange.

3.3 Vessel cargo control room: The ship cargo control room is located on the ship and used to control transmission operations.

3.4 Emergency cut-off: It refers to a safe and effective method for cutting off the LNG carrier shore/ship transfer operation.

3.5 Emergency release system (ERS): It refers to a system that quickly releases the loading/unloading arm and safely disconnects the LNG carrier from the terminal by compulsory means.

4 Drawings and Data

4.1 The following drawings shall be submitted for review:

(1) Technical specifications of product;

(2) System block diagram, which shall indicate the system power supply, internal connection of main units/modules and interfaces and protocols with other systems;

(3) Outline dimensional arrangement plans and assembly drawings of main components;

(4) Panel arrangement plan;

(5) Electrical schematic diagram;

(6) External wiring diagram;

(7) Product instructions;

(8) List of components and parts;

(9) Relevant drawings and data shall be submitted according to Class II computer system in accordance with the requirements of Table 2.6.1.3, Section 6, Chapter 2, Part 7 of Rules for Classification of Sea-Going Steel Ships;

(10) Delivery test program.

5 Technical Requirements

5.1 General requirement

5.1.1 The ship-shore link system shall be designed and produced in accordance with the applicable parts of ISO 28460:2010.

5.1.2 Data, ESD and ERS signals, as well as voice communication can be transmitted between ship and shore. Signals may be transmitted via electrical signals, optical fibers, pneumatic or wireless transmission, or a combination thereof. ESD and ERS signals cannot be transmitted wirelessly.

5.2 Voice communication

5.2.1 Communication in case of emergency

A set of emergency telephone (hot line) shall be provided between the ship-shore control station. At the same time, a backup communication system shall be provided, which may be another set of telephone equipment or radio communication installation.

5.2.2 Communication under normal operating conditions

Under normal operating conditions, additional telephone communication installation may be provided between the ship-to-shore cargo control stations.

5.3 Data communication

5.3.1 Mooring line tension, wave height and other data shall be transmitted via optical cables or cables.

5.3.2 The data that need to be transmitted in non-emergency situations can be transmitted by appropriate wireless means.

5.4 Transmission of emergency cut-off signal

5.4.1 The emergency cut-off setting shall be fail-safe.

5.4.2 ESD signals shall be transmitted via cables or optical cables of the ship-shore link system.

5.4.3 There shall be an independent back-up system for transmission of ESD signals. The system may transmit signals by electrical, optical or pneumatic means in order to reduce common fault modes as far as reasonably practicable.

5.4.4 The data transmission and communication interface configuration shall meet the requirements of Appendix D of ISO 28460:2010.

5.4.5 The emergency release system shall be activated manually or automatically due to excessive movement or acceleration of the bunkering arm.

5.5. System layout

The onboard equipment of the ship-shore link system shall have the protection grade and explosion-proof grade suitable for its environment.

5.6 ESD control system

If the ship-shore link system has ESD control function at the same time, the ESD control system shall meet the requirements of 18.10 in Chapter 18 of IGC CODE

(MSC.370(93)) and 15.3 in ISO 28460.

6 Raw Materials, Parts and Components

Raw materials and parts and components of products shall be controlled in accordance with the relevant requirements of our current specifications.

7 Type Test

N/A

8 Unit/Batch Inspection

8.1 The factory shall conduct single-piece/single-batch inspection on each ship-shore link system and submit the factory self-inspection report. The surveyors of the CCS shall carry out sampling survey according to the actual situation.

8.2 Unit/batch survey items shall at least include the following:

8.2.1 Appearance inspection and software version number confirmation: Check the appearance structure, selected materials, internal wiring, manufacturing process and signs of the equipment to prove that it conforms to the relevant provisions of the CCS's specifications, technical conditions formulated by the manufacturer, approved drawings and data, etc. Check to confirm the software version number of the system.

8.2.2 Withstand voltage test: The test shall be carried out according to the test voltage in Table 8.2.2, and the test voltage frequency is 50Hz or 60Hz. This test shall last for 1min without breakdown or flashover. Printed circuit boards with electronic components that may cause damage during the test can be removed before the test.

Test Voltage **Table 8.2.2**

Rated voltage V	Test voltage V

$Un \leq 65$	$2\times Un+500$
$65 < Un \leq 250$	1500
$250 < Un \leq 500$	2000
$500 < Un \leq 690$	2500

8.2.3 Insulation resistance measurement: After the withstand voltage test, the insulation resistance shall be measured between live parts and between live parts and ground (enclosure) according to the test voltage in Table 8.2.3 (1). The insulation resistance value shall not be lower than the requirements of Table 8.2.3 (2). Printed circuit boards with electronic components that may cause damage due to the test voltage during the test can be removed before the test.

Voltage Value of Insulation Resistance Test **Table 8.2.3(1)**

Rated voltage V	DC test voltage V
$Un \leq 65$	$2\times Un$, min. 24 V
$Un > 65$	500

Insulation Resistance Table **Table8.2.3(2)**

Rated voltage V	Minimum insulation resistance value (MΩ)	
	Before the test	After the test
$Un \leq 65$	10	1
$Un > 65$	100	10

8.2.4 Function test: Verify whether the functions of the equipment meet the requirements of approved drawings and data and technical conditions of the products, including but not limited to at least the following contents:

(1) Voice communication;

(2) Data communication;

(3) Transmission of emergency cut-off signal;

(4) ESD control function (if applicable);

(5) Alarm and indication functions.

8.2.5 Enclosure protection test: According to IEC60529 publication, verify whether the enclosure protection of equipment meets the requirements of corresponding protection grade.