CCS Rule Change Notice For:

RULES FOR CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING LIQUEFIED GASES IN BULK

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Beijing

Brief Introduction

According to CCS decision on the implementation of IACS resolution released recently, the contents of the IACS UI G32(New, Feb., 2021) titled “Outer Duct in Gas Fuel Piping Systems”, UI G33(New, Feb., 2021) titled “Cargo Sampling ”, UI G34(New, Feb., 2021) titled “Cargo Filters”, UI G35(New, Feb., 2021) titled “Inhibition of Cargo Pump Operation and Opening of Manifold ESD valves with Level Alarms Overridden”, UI G36(New, Feb., 2021) titled “Oxygen Deficiency Monitoring Equipment in a Nitrogen Generator Room Area” and UI G32(New, Feb., 2021) titled “Suitable Pressure Relief System for Air Inlet, Scavenge Spaces, Exhaust System and Crank Case” are included in this change notice. Revised to add CCS5.4.4, CCS5.6.5.c,CCS5.6.6.b, CCS5.13.2, CCS13.6.4, CCS16.7.1, CCS18.9, CCS table 18.1, The underlined wording are updated new contents.

This change notice will take effect on July 1 2021 and will apply to the ships signing the construction contract on July 1 2021 and later.

CONTENTS

PART THREE THE INTERNATIONAL CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING LIQUEFIED GASES IN BULK

CHAPTER 5 PROCESS PRESSURE VESSELS AND LIQUID, VAPOUR AND PRESSURE PIPING SYSTEMS

5.4.4 The design pressure of the outer pipe or duct of gas fuel systems shall not be less than the maximum working pressure of the inner gas pipe. Alternatively, for gas fuel piping systems with a working pressure greater than 1 MPa, the design pressure of the outer duct shall not be less than the maximum built-up pressure arising in the annular space considering the local instantaneous peak pressure in way of any rupture and the ventilation arrangements.

CCS5.4.4 The expression "design pressure of the outer pipe or duct" in 5.4.4 is either of the following:

1. The maximum pressure that can act on the outer pipe or equipment enclosure after the inner pipe rupture as documented by suitable calculations taking into account the venting arrangements; or

2. For gas fuel systems with inner pipe working pressure greater than 1 MPa, the "maximum built-up pressure arising in the annular space", after the inner pipe rupture, which is to be calculated in accordance with paragraph 9.8.2 of the IGF Code as adopted by MSC.391(95).

5.6.5 Cargo sampling connections

5.6.5.1 Connections to cargo piping systems for taking cargo liquid samples shall be clearly marked and shall be designed to minimize the release of cargo vapours. For vessels permitted to carry toxic products, the sampling system shall be of a closed loop design to ensure that cargo liquid and vapour are not vented to atmosphere.

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CCS5.6.5.c These requirements are only applicable if such a sampling system is fitted on board. Connections used for control of atmosphere in cargo tanks during inerting or gassing up are not considered as cargo sampling connections.

5.6.6 Cargo filters

The cargo liquid and vapour systems shall be capable of being fitted with filters to protect against damage by extraneous objects. Such filters may be permanent or temporary, and the standards of filtration shall be appropriate to the risk of debris, etc., entering the cargo system. Means shall be provided to indicate that filters are becoming blocked, and to isolate, depressurize and clean the filters safely.

CCS 5.6.6 Blockage of filters may be determined by means of a pressure indicator.

CCS5.6.6.b Means to indicate that filters are becoming blocked and filter maintenance is required is to be provided for fixed in-line filter arrangement and portable filter installations where dedicated filter housing piping is provided. Where portable filters for fitting to manifold presentation flanges are used without dedicated filter housing, and these can be visually inspected after each loading and discharging operation, no additional arrangements for indicating blockage or facilitating drainage are required.

5.13.2.4 In double wall gas-fuel piping systems, the outer pipe or duct shall also be pressure tested to show that it can withstand the expected maximum pressure at gas pipe rupture.

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CCS5.13.2 The expression "maximum pressure at gas pipe rupture" in 5.13.2.4 is the maximum pressure to which the outer pipe or duct is subjected after the inner pipe rupture and for testing purposes it is the same as the design pressure used in 5.4.4.

CHAPTER 13 INSTRUMENTATION AND AUTOMATION SYSTEMS

13.6.4 Where indicated by an “A” in column “f” in the table of chapter 19 ships certified for carriage of non-flammable products, oxygen deficiency monitoring shall be fitted in cargo machinery spaces and hold spaces for independent tanks other than type C tanks. Furthermore, oxygen deficiency monitoring equipment shall be installed in enclosed or semi-enclosed spaces containing equipment that may cause an oxygen-deficient environment such as nitrogen generators, inert gas generators or nitrogen cycle refrigerant systems.

CCS13.6.4 Two oxygen sensors are to be positioned at appropriate locations in the space or spaces containing the inert gas system, in accordance with paragraph 15.2.2.4.5.4 of the FSS Code, for all gas carriers, irrespective of the carriage of cargo indicated by an "A" in column "f" in the table in chapter 19 of the Code.

CHAPTER 16 USE OF CARGO AS FUEL

16.7.1.4 Unless designed with the strength to withstand the worst case overpressure due to ignited gas leaks, air inlet manifolds, scavenge spaces, exhaust system and crank cases shall be fitted with suitable pressure relief systems. Pressure relief systems shall lead to a safe location, away from personnel.

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CCS16.7.1 For the pressure relief systems in 16.7.4.1:

1. A suitable pressure relief system for air inlet manifolds, scavenge spaces and exhaust system is to be provided unless designed to accommodate the worst-case overpressure due to ignited gas leaks or justified by the safety concept of the engine. A detailed evaluation regarding the hazard potential of overpressure in air inlet manifolds, scavenge spaces and exhaust system is to be carried out and reflected in the safety concept of the engine.

2. In the case of crankcases, the explosion relief valves, as required by Regulation 27.4 of SOLAS Chapter II-1 as amended by IMO resolutions up to MSC.436(99), are to be considered suitable for the gas operation of the engine. For engines not covered by said Regulation, a detailed evaluation regarding the hazard potential of fuel gas accumulation in the crankcase is to be carried out.

CHAPTER 18 OPERATING REQUIREMENTS

18.9 Cargo sampling

18.9.1 Any cargo sampling shall be conducted under the supervision of an officer who shall ensure that protective clothing appropriate to the hazards of the cargo is used by everyone involved in the operation.

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18.9.5 After sampling operations are completed, the officer shall ensure that any sample valves used are closed properly and the connections used are correctly blanked.

CCS18.9 These requirements are only applicable if such a sampling system is fitted on board. Connections used for control of atmosphere in cargo tanks during inerting or gassing up are not considered as cargo sampling connections.

Table 18.1 – ESD functional arrangements

	Pumps		Compressor systems				Valves	Link
Shutdown action → **Initiation ↓**	Cargo pumps/ cargo booster pumps	Spray/ stripping pumps	Vapour return compressors	Fuel gas compressors	Reliquefaction plant***, including condensate return pumps, if fitted	Gas combustion unit	ESD valves	Signal to ship/ shore link****
Emergency push buttons (see 18.10.3.1)	√	√	√	Note 2	√	√	√	√
Fire detection on deck or in compressor house* (see 18.10.3.2)	√	√	√	√	√	√	√	√
High level in cargo tank (see 13.3.2 and 13.3.3)	√	√	√	Note 1 Note 2	Note1 Note 3	Note 1	Note 6	√
Signal from ship/shore link (see 18.10.1.4)	√	√	√	Note 2	Note 3	n/a	√	n/a
Loss of motive power to ESD valves**	√	√	√	Note 2	Note 3	n/a	√	√
Main electric power failure (“blackout”)	Note 7	Note 7	Note 7	Note 7	Note 7	Note 7	√	√
Level alarm override (see 13.3.7)	Note 4	Note 4 Note 5	√	Note 1	Note1	Note 1	√	√

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Note 1: These items of equipment can be omitted from these specific automatic shutdown initiators, provided the equipment inlets are protected against cargo liquid ingress.

Note 2: If the fuel gas compressor is used to return cargo vapour to shore, it shall be included in the ESD system when operating in this mode.

Note 3: If the reliquefaction plant compressors are used for vapour return/shore line clearing, they shall be included in the ESD system when operating in that mode.

Note 4: The override system permitted by 13.3.7 may be used at sea to prevent false alarms or shutdowns. When level alarms are overridden, operation of cargo pumps and the opening of manifold ESD valves shall be inhibited except when high-level alarm testing is carried out in accordance with 13.3.5 (see 18.10.3.4).

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CCS table 18.1 In applying the second sentence of note 4 of table 18.1, a hardware system such as an electric or mechanical interlocking device is to be provided to prevent inadvertent operation of cargo pumps and inadvertent opening of manifold ESD valves.