

Amendment on 20 June 2025

Resolved by Technical Committee on 25 January 2023

Arrangement of Cargo Piping and Gas-freeing Piping for Tankers

Object of Amendment

Guidance for the Survey and Construction of Steel Ships Parts D, S, and R

Reason for Amendment

Regulation II-2/4.5.6.1 of SOLAS specifies that hazards related to the dispersal of flammable vapours for purging or gas-freeing are to be minimised. This regulation as well as corresponding IMO circulars and IACS unified interpretations have already been incorporated into the NK Rules.

In response to various tanker fire accidents that occurred between 2004 and 2014, the IMO and IACS began to consider the establishment of additional safety measures. At the seventh session of the IMO Sub-Committee on Ship Systems and Equipment (SSE7), IACS was requested by the sub-committee to prepare a unified interpretation (UI) related to cargo and gas-freeing piping arrangements. In response, IACS submitted a draft UI clarifying the piping requirements for the installation of gas-freeing pipe systems and blowers located outside cargo areas to SSE8.

After the repeated consideration on its effective date and so on, the draft unified interpretation was generally agreed upon at SSE10 in February 2024. It was then approved by the 109th session of the IMO Maritime Safety Committee (MSC109) held in December 2024 as MSC.1/Circ.1683.

Accordingly, relevant requirements are amended in accordance with MSC.1/Circ.1683.

Outline of Amendment

Amends piping requirements related to the installation of gas-freeing pipe systems and blowers installed outside of tanker cargo areas.

Effective Date and Application

This amendment applies to gas-freeing piping systems that fall under the following:

- (1) Systems installed on ships for which the building contract is placed on or after 1 January 2026. In the absence of a building contract, systems installed on ships constructed on or after 1 January 2026.
- (2) For ships other than those subject to (1) above, systems for which the contractual delivery date to the ship is on or after 1 January 2026. In the absence of a contractual delivery date, systems for which the actual delivery date to the ship is on or after 1 January 2026.

ID:DD22-29

Amended-Original Requirements Comparison Table (The Arrangement of Cargo Piping and Gas-freeing Piping for Tankers)

Amended	Original	Remarks
<p align="center">GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS</p> <p align="center">Part D MACHINERY INSTALLATIONS</p> <p align="center">D14 PIPING SYSTEMS FOR TANKERS</p> <p>D14.2 Cargo Oil Pumps, Cargo Oil Piping Systems, Piping in Cargo Oil Tanks, etc.</p> <p>D14.2.4 Separation of Cargo Oil Pumps and Cargo Oil Pipes</p> <p>1 Piping systems to be connected to cargo oil piping are to be dealt with under the following requirements:</p> <p>(1) (Omitted)</p> <p>(2) In cases where cargo oil piping systems are connected to the following piping systems:</p> <p>(a) <u>Inert gas piping systems (including cases when such systems are also being used as gas-freeing pipe systems)</u> <u>The requirements in 35.2.2-3(2)(g) and (h), Part R of the Rules are to be complied with.</u></p> <p>(b) <u>Gas-freeing piping systems other than the ones specified in (a) above</u> <u>The following (i) or (ii).</u></p> <p>(i) <u>The requirements in 35.2.2-3(2)(g) and (h), Part R of the Rules are to be complied with in cases where gas-freeing piping systems and blowers are installed in cargo</u></p>	<p align="center">GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS</p> <p align="center">Part D MACHINERY INSTALLATIONS</p> <p align="center">D14 PIPING SYSTEMS FOR TANKERS</p> <p>D14.2 Cargo Oil Pumps, Cargo Oil Piping Systems, Piping in Cargo Oil Tanks, etc.</p> <p>D14.2.4 Separation of Cargo Oil Pumps and Cargo Oil Pipes</p> <p>1 Piping systems to be connected to cargo oil piping are to be dealt with under the following requirements:</p> <p>(1) (Omitted)</p> <p>(2) In cases where cargo oil piping systems are connected to the following piping systems:</p> <p>(a) <u>Tank vent pipes</u> <u>The requirements in 35.2.2-3(2)(g) and (h), Part R of the Rules are to be complied with. In addition, ventilating fans, except for inert gas blowers, are to be installed within hazardous area (as for the definition of “hazardous area,” see 4.2.3-1, Part H of the Rules).</u></p>	

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<p><u>areas.</u></p> <p><u>(ii) The requirements in R4.5.6-2 to R4.5.6-10 are to be complied with in cases where gas-freeing piping systems and blowers are installed outside cargo areas.</u></p> <p>(c) Pressure gauge pipes for cargo oil piping systems (including pumps) Pressure gauges to which cargo oil is directly led are to be installed in pump rooms or on weather decks. However, in cases where stop valves are provided at joints between pressure gauge piping systems and cargo oil piping systems, and in cases where bulkhead valves are provided at locations where such pipes penetrate bulkhead between engine rooms and pump rooms, pressure gauges may be installed in engine rooms.</p> <p>(d) Pipes for measuring oil content Sampling pipes for measuring oil content may be led to spaces other than hazardous areas, in cases where such pipes have nominal diameters of 25 A or less and in cases where two or more stop valves are provided between cargo oil piping and the penetrations of the casings of non-hazardous areas.</p>	<p>(b) Pressure gauge pipes for cargo oil piping systems (including pumps) Pressure gauges to which cargo oil is directly led are to be installed in pump rooms or on weather decks. However, in cases where stop valves are provided at joints between pressure gauge piping systems and cargo oil piping systems, and in cases where bulkhead valves are provided at locations where such pipes penetrate bulkhead between engine rooms and pump rooms, pressure gauges may be installed in engine rooms.</p> <p>(c) Pipes for measuring oil content Sampling pipes for measuring oil content may be led to spaces other than hazardous area, in cases where such pipes have nominal diameters of 25 A or less and in cases where two or more stop valves are provided between cargo oil piping and the penetration of the casing of non-hazardous area.</p>	

Amended-Original Requirements Comparison Table (The Arrangement of Cargo Piping and Gas-freeing Piping for Tankers)

Amended	Original	Remarks
<p align="center">GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS</p> <p align="center">Part S SHIPS CARRYING DANGEROUS CHEMICALS IN BULK</p> <p align="center">S3 SHIP ARRANGEMENTS</p> <p>S3.1 Cargo Segregation</p> <p>S3.1.3 Cargo Piping 1 Cargo piping is not to pass through the spaces specified in 3.1.3, Part S of the Rules, in addition, spaces such as fuel oil tanks, freshwater tanks and control stations.</p> <p><u>2 Gas-freeing piping systems and blowers may be arranged outside cargo areas in accordance with R4.5.6-2 to R4.5.6-10.</u></p>	<p align="center">GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS</p> <p align="center">Part S SHIPS CARRYING DANGEROUS CHEMICALS IN BULK</p> <p align="center">S3 SHIP ARRANGEMENTS</p> <p>S3.1 Cargo Segregation</p> <p>S3.1.3 Cargo Piping Cargo piping is not to pass through the spaces specified in 3.1.3, Part S of the Rules <u>and</u>, in addition, spaces such as fuel oil tanks, fresh water tanks and control stations. (Newly added)</p>	

Amended-Original Requirements Comparison Table (The Arrangement of Cargo Piping and Gas-freeing Piping for Tankers)

Amended	Original	Remarks
<p align="center">GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS</p> <p align="center">Part R FIRE PROTECTION, DETECTION AND EXTINCTION</p> <p align="center">R4 PROBABILITY OF IGNITION</p> <p>R4.5 Cargo Areas of Tankers</p> <p>R4.5.6 Inerting, Purging and Gas-freeing 1 “Gas-free” specified in 4.5.6-1, Part R of the Rules means a condition in a tank where the content of hydrocarbon or other flammable vapour is less than 1% of the lower flammable limit (<i>LFL</i>), the oxygen content is at least 21%, and no toxic gases are present. 2 <u>All cargo piping systems (including cargo oil piping, cargo tank venting piping, pressure relief piping and gas-freeing piping, etc.), except for the cargo piping systems for bows and stern loading, are to be arranged in the cargo area as specified in 3.2.6, Part R of the Rules. However, gas-freeing pipe systems and blowers may be arranged outside the cargo area in accordance with the following -3 to -10 (See Fig. R4.5.6).</u> 3 <u>Gas-freeing piping systems are not to be permanently connected to cargo piping or cargo tank venting piping. In addition, such systems are to satisfy the following (1) to (5) requirements.</u> <u>(1) The connections between cargo oil piping and</u></p>	<p align="center">GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS</p> <p align="center">Part R FIRE PROTECTION, DETECTION AND EXTINCTION</p> <p align="center">R4 PROBABILITY OF IGNITION</p> <p>R4.5 Cargo Areas of Tankers</p> <p>R4.5.6 Inerting, Purging and Gas-freeing “Gas-free” specified in 4.5.6-1, Part R of the Rules means a condition in a tank where the content of hydrocarbon or other flammable vapour is less than 1% of the lower flammable limit (<i>LFL</i>), the oxygen content is at least 21%, and no toxic gases are present. (Newly added)</p> <p>(Newly added)</p>	

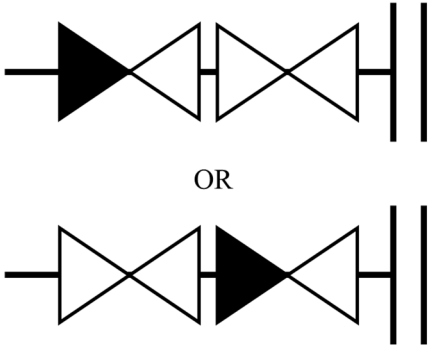
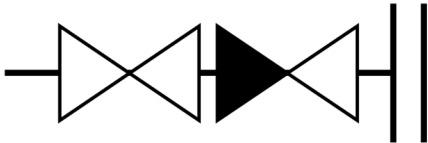
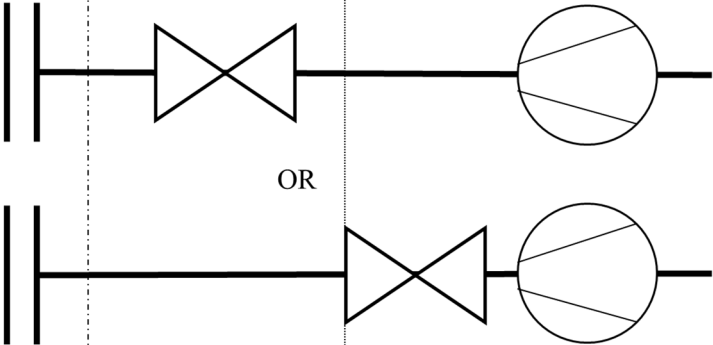
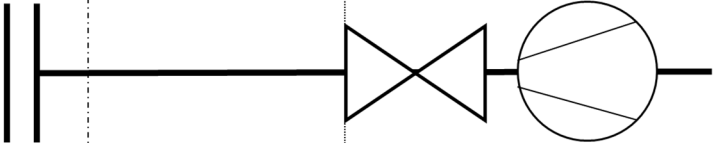
Amended-Original Requirements Comparison Table (The Arrangement of Cargo Piping and Gas-freeing Piping for Tankers)

Amended	Original	Remarks
<p><u>gas-freeing piping are to be of a detachable type consisting of spool pieces, ducts or hoses, etc., and are also to be provided with two shut-off valves fitted as specified in (2) below. Such detachable connections are to be arranged in the cargo area.</u></p> <p>(2) <u>A non-return valve is to be provided in the cargo area on the cargo side (between the detachable connection and the cargo tank). Shut-off valves are to be provided on the cargo side and on the blower side (between the detachable connection and the blower). The combination of a shut-off valve and a non-return valve on the cargo side may be replaced by a single non-return valve with a positive means of closure.</u></p> <p>(3) <u>The shut-off valve on the blower side is to open after the air-supply blower is started; this is to be triggered by fan discharge pressure.</u></p> <p>(4) <u>The shut-off valve on the blower side is to automatically close when the air-supply blower is stopped or in the event of a loss of gas-freeing air pressure.</u></p> <p>(5) <u>When the gas-freeing piping system is arranged to penetrate through a bulkhead facing the cargo area, the shut-off valve on the blower side is to be fitted directly to said bulkhead. This shut-off valve, however, need not be located inside the blower room. Alternatively, the shut-off valve on the blower side may be fitted on an open deck located away from the bulkhead. In all cases, the electrical parts of this shut-off valve are to be certified as safe type for use in concerned hazardous areas.</u></p> <p>4 <u>The gas-freeing piping system from the blower air intakes till the shut-off valve on the blower side is to be</u></p>	<p align="center">(Newly added)</p>	

Amended-Original Requirements Comparison Table (The Arrangement of Cargo Piping and Gas-freeing Piping for Tankers)

Amended	Original	Remarks
<p><u>arranged in a non-hazardous area. However, when the shut-off valve is arranged outside the blower room as specified in -3(5) above, gas-freeing piping systems from blower air intakes to blower room bulkheads facing cargo areas may be arranged in non-hazardous areas.</u></p> <p><u>5 The air intakes for gas-freeing blowers are to be located in non-hazardous areas on open decks.</u></p> <p><u>6 When not being used in gas-freeing operations, detachable connections are to be dismantled and all the openings closed with blank flanges. A warning plate is to be provided in the vicinity of each opening, stating “This opening is to be closed with a blank flange when not being used during gas-freeing operations”.</u></p> <p><u>7 Gas-freeing piping systems and blowers are not to be used for any other purpose.</u></p> <p><u>8 Blowers are to be of a non-sparking type, and the non-sparking type is to be in accordance with R4.5.4-1(2).</u></p> <p><u>9 When electrical motors driving blowers are fitted in gas-freeing piping systems or located in cargo areas, they are to be of an explosion-proof type. However, the requirements for electric motors on ships carrying dangerous chemical in bulk are to be in accordance with 12.2.8, Part S of the Rules.</u></p> <p><u>10 Information related to the operational procedures for gas-freeing specified in (1) and (2) below is to be provided to the ship master.</u></p> <p><u>(1) Detachable connections are to only be connected and fixed to the piping no more than 10 minutes prior to gas-freeing operations.</u></p> <p><u>(2) Shut-off valves on the blower side are to only be opened after the operation of the blower has started, and such valves are to be interlocked with fan discharge pressure.</u></p>	<p>(Newly added)</p> <p>(Newly added)</p> <p>(Newly added)</p> <p>(Newly added)</p> <p>(Newly added)</p> <p>(Newly added)</p>	

Amended-Original Requirements Comparison Table (The Arrangement of Cargo Piping and Gas-freeing Piping for Tankers)

Amended	Original	Remarks
<p style="text-align: center;"><u>Fig. R4.5.6</u></p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>Cargo side</p>  <p>OR</p>  <p>← Cargo area</p> </div> <div style="text-align: center;"> <p>Blower side</p>  <p>OR</p>  <p>Bulkhead</p> </div> </div> <p><u>Notes:</u></p> <p>(1) The shut-off valve at the blower side may be fitted in a hazardous area provided that electrical parts of this valve are of certified safe type for use in the concerned hazardous area (Zone 1 or Zone 2).</p> <p>(2) The line indicating "Cargo area" in this figure means that the detachable connection needs to be arranged inside of the cargo area, but it does not mean that the shut-off valve at the blower side is necessarily arranged outside of the cargo area.</p>		
<p style="text-align: center;">EFFECTIVE DATE AND APPLICATION</p> <ol style="list-style-type: none"> The effective date of the amendments is 1 January 2026. Notwithstanding the amendments, the current requirements apply to gas-freeing piping systems for which the contractual delivery date (In the absence of a contractual delivery date, systems for which the actual delivery date) to the ship is before the effective date. 		