

Amendment on 27 June 2024
Resolved by Technical Committee on 30 January 2024

Corrosion in Piping Systems for Discharge Lines of Exhaust Gas Cleaning Systems

Object of Amendment

Rules for the Survey and Construction of Steel Ships Part D

Object of Amendment

IACS Unified Requirement (UR) M81 specifies requirements for the storage and handling of chemicals used by Exhaust Gas Cleaning Systems (EGCS). These requirements have already been incorporated into the NK Rules.

Recently, ClassNK has received a number of reports of piping systems for EGCS discharge lines, such as distance pieces fitted onto hull structures, suffering severe corrosion damage leading to engine room flooding due to the influence of the washwater used by EGCS. Class NK moved quickly in response to resolve these problems by conducting damage investigations and taking other actions, and has already added requirements to its Rules to help prevent future occurrences of such damage. IACS, in turn, also considered corrosion resistance requirements for piping systems used in such discharge lines and adopted UR M81 (Rev.1) in July 2023.

Accordingly, relevant requirements are amended based upon UR M81 (Rev.1).

Outline of Amendment

Amends requirements for distance pieces attached to washwater piping systems used in scrubber chambers.

Effective Date and Application

This amendment applies to EGCS that fall under either of the following:

- (1) those for which the application for approval is submitted to the Society on or after 1 July 2024; or
- (2) those installed on ships for which the date of contract for construction is on or after 1 July 2024.

Notwithstanding (1) and (2) above, this draft amendment may apply, upon request of the shipowner, to EGCS other than those specified above.

ID: DD23-19

Amended-Original Requirements Comparison Table
(Corrosion in Piping Systems for Discharge Lines of Exhaust Gas Cleaning Systems)

Amended	Original	Remarks
<p align="center">RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS</p> <p align="center">Part D MACHINERY INSTALLATIONS</p> <p align="center">Chapter 22 EXHAUST GAS CLEANING SYSTEMS AND ASSOCIATED EQUIPMENT</p> <p>22.2 Design</p> <p>22.2.2 Material 2 Storage tanks, pipes/piping systems <u>and drip trays</u> for chemical treatment fluids which transfer undiluted chemical treatment fluids are to be of steel or other equivalent material with a melting point above 925 °C.</p> <p>22.3 Exhaust Gas Cleaning Systems</p> <p>22.3.1 Construction of Exhaust Gas Cleaning Systems 5 Arrangement of pipes for overboard discharges (1) <u>Overboard discharge from exhaust gas cleaning systems are not to be interconnected to other systems.</u> (2) <u>Due consideration is to be given to the location of overboard discharge with respect to vessel propulsion features, such as thrusters, propellers or as in 13.3.2-1 to prevent discharge water from falling onto survival craft (lifeboats and liferafts) when abandoning ship.</u></p>	<p align="center">RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS</p> <p align="center">Part D MACHINERY INSTALLATIONS</p> <p align="center">Chapter 22 EXHAUST GAS CLEANING SYSTEMS AND ASSOCIATED EQUIPMENT</p> <p>22.2 Design</p> <p>22.2.2 Material 2 Storage tanks <u>and</u> pipes/piping systems for chemical treatment fluids which transfer undiluted chemical treatment fluids are to be of steel or other equivalent material with a melting point above 925 °C.</p> <p>22.3 Exhaust Gas Cleaning Systems</p> <p>22.3.1 Construction of Exhaust Gas Cleaning Systems 5 Arrangement of pipes for overboard discharges <u>Pipes for overboard discharges of washwater used in exhaust gas cleaning systems are to be entirely separate from other pipes. The position and direction of the discharge is to be arranged so as to preserve the integrity of hull and propeller, etc.</u></p>	<p>UR M81.2.10</p> <p>UR M81.3.1 and M81.3.2</p>

Amended-Original Requirements Comparison Table
(Corrosion in Piping Systems for Discharge Lines of Exhaust Gas Cleaning Systems)

Amended	Original	Remarks
<p>22.4 Requirements for Construction and Arrangements, etc.</p> <p>22.4.1 Construction and Arrangement</p> <p>15 Piping systems for washwater used in scrubber chambers are to be constructed of corrosion resistance materials or are to be otherwise appropriately protected, taking into account the corrosive effects of the water.</p> <p>16 For <u>piping systems for washwater used in scrubber chambers</u>, where materials other than hull construction materials are used and where two or more kinds of different metallic materials are arranged adjacent to each other, appropriate measures are to be taken to prevent bimetallic corrosion (<u>galvanic corrosion</u>).</p> <p>17 <u>In case distance piece is fitted to the piping system specified in -15 above, it is to be made of corrosion resistant steel material or be coated with an anti-corrosive material suitable for the operating environment. In addition, the thickness of the distance piece is to be at least the minimum values specified in the following (1) and (2). If the values specified in the following (1) and (2) do not exist as standardised values, the thickness specified in piping standard Schedule 160 (Sch.160) are, as far as practicable, to be used instead.</u></p> <p>(1) <u>12 mm in cases where complete pipe is made of corrosion resistant material steel.</u></p> <p>(2) <u>15 mm of mild steel in cases where the inside the pipe is treated with an anticorrosive coating or fitted with a sleeve of corrosion resistant material.</u></p> <p>18 The following connections on piping systems only for chemical treatment fluids are to be screened or provided with other appropriate means, and fitted with drip trays to prevent</p>	<p>22.4 Requirements for Construction and Arrangements, etc.</p> <p>22.4.1 Construction and Arrangement</p> <p>15 Piping systems for washwater used in scrubber chambers are to be constructed of corrosion resistance materials or are to be otherwise appropriately protected, taking into account the corrosive effects of the water.</p> <p>16 For <u>distance pieces fitted onto the piping systems specified in -15 above</u>, where materials other than hull construction materials are used and where two or more kinds of different metallic materials are arranged adjacent to each other, appropriate measures are to be taken to prevent bimetallic corrosion. (Newly added)</p> <p>17 The following connections on piping systems only for chemical treatment fluids are to be screened or provided with other appropriate means, and fitted with drip trays to prevent</p>	<p>UR 81.3.4</p> <p>UR 81.3.5</p>

**Amended-Original Requirements Comparison Table
(Corrosion in Piping Systems for Discharge Lines of Exhaust Gas Cleaning Systems)**

Amended	Original	Remarks
<p>the spread of any spillage where they are installed:</p> <ol style="list-style-type: none"> (1) Detachable connections between pipes (flanged connections, mechanical joints, etc.); (2) Detachable connections between pipes and equipment such as pumps, strainers, heaters, valves; and (3) Detachable connections between equipment mentioned in (1) and (2) above. <p>19 The drip trays specified in -18 above are to be fitted with drain pipes which lead to appropriate tanks, such as <u>the</u> residue tanks specified in -14 above, which are fitted with high level alarm, or are to be fitted with alarms for leak detection. In cases where such tank is an integral tank, -7(1) and (2) above are to be applied to the tank (the term “these tanks” specified in -7(1) and (2) is to be read as “appropriate tanks, such as residue tanks”).</p> <p>22.4.2 Ventilation Systems</p> <p>1 If storage tanks for chemical treatment fluids is installed in a closed compartment, the area is to be served by an effective mechanical ventilation system of extraction type providing not less than 6 air changes per hour which is independent from the ventilation system of <u>other spaces</u>. The ventilation system is to be capable of being controlled from outside the compartment. A warning notice requiring the use of such ventilation before entering the compartment is to be provided outside the compartment adjacent to each point of entry.</p> <p>22.4.3 Venting Systems of Storage Tanks for Chemical Treatment Fluids</p> <p>2 Storage tanks for chemical treatment fluids are to be arranged so that they can be <u>safely</u> emptied of the fluids and ventilated by means of portable or permanent systems.</p>	<p>the spread of any spillage where they are installed:</p> <ol style="list-style-type: none"> (1) Detachable connections between pipes (flanged connections, mechanical joints, etc.); (2) Detachable connections between pipes and equipment such as pumps, strainers, heaters, valves; and (3) Detachable connections between equipment mentioned in (1) and (2) above. <p>18 The drip trays specified in -17 above are to be fitted with drain pipes which lead to appropriate tanks, such as <u>the</u> residue tanks specified in -14 above, which are fitted with high level alarm, or are to be fitted with alarms for leak detection. In cases where such tank is an integral tank, -7(1) and (2) above are to be applied to the tank (the term “these tanks” specified in -7(1) and (2) is to be read as “appropriate tanks, such as residue tanks”).</p> <p>22.4.2 Ventilation Systems</p> <p>1 If storage tanks for chemical treatment fluids is installed in a closed compartment, the area is to be served by an effective mechanical ventilation system of extraction type providing not less than 6 air changes per hour which is independent from the ventilation system of <u>accommodation, service spaces, or control stations</u>. The ventilation system is to be capable of being controlled from outside the compartment. A warning notice requiring the use of such ventilation before entering the compartment is to be provided outside the compartment adjacent to each point of entry.</p> <p>22.4.3 Venting Systems of Storage Tanks for Chemical Treatment Fluids</p> <p>2 Storage tanks for chemical treatment fluids are to be arranged so that they can be emptied of the fluids and ventilated by means of portable or permanent systems.</p>	<p></p> <p>UR M81.2.3</p> <p>UR M81.2.6</p>

**Amended-Original Requirements Comparison Table
(Corrosion in Piping Systems for Discharge Lines of Exhaust Gas Cleaning Systems)**

Amended	Original	Remarks
EFFECTIVE DATE AND APPLICATION		
<ol style="list-style-type: none"> 1. The effective date of the amendments is 1 July 2024. 2. Notwithstanding the amendments to the Rules, the current requirements apply to EGCS whose applications for approval are submitted to the Society before the effective date installed on ships for which the date of contract for construction* is before the effective date. 3. Notwithstanding the provision of preceding 2., the amendments to the Rules may apply to EGCS whose applications for approval are submitted to the Society before the effective date installed on ships for which the date of contract for construction* is before the effective date upon request of the owner. * “contract for construction” is defined in the latest version of IACS Procedural Requirement (PR) No.29. 		
IACS PR No.29 (Rev.0, July 2009)		
<ol style="list-style-type: none"> 1. The date of “contract for construction” of a vessel is the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. This date and the construction numbers (i.e. hull numbers) of all the vessels included in the contract are to be declared to the classification society by the party applying for the assignment of class to a newbuilding. 2. The date of “contract for construction” of a series of vessels, including specified optional vessels for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective owner and the shipbuilder. For the purpose of this Procedural Requirement, vessels built under a single contract for construction are considered a “series of vessels” if they are built to the same approved plans for classification purposes. However, vessels within a series may have design alterations from the original design provided: <ol style="list-style-type: none"> (1) such alterations do not affect matters related to classification, or (2) If the alterations are subject to classification requirements, these alterations are to comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the shipbuilder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to the Society for approval. The optional vessels will be considered part of the same series of vessels if the option is exercised not later than 1 year after the contract to build the series was signed. 3. If a contract for construction is later amended to include additional vessels or additional options, the date of “contract for construction” for such vessels is the date on which the amendment to the contract, is signed between the prospective owner and the shipbuilder. The amendment to the contract is to be considered as a “new contract” to which 1. and 2. above apply. 4. If a contract for construction is amended to change the ship type, the date of “contract for construction” of this modified vessel, or vessels, is the date on which revised contract or new contract is signed between the Owner, or Owners, and the shipbuilder. 		
Note: This Procedural Requirement applies from 1 July 2009.		