



CIRCULAR

36 Myeongji ocean city 9-ro,
Gangseo-gu, Busan, 618-814
Republic of Korea

Phone : +82-70-8799-8799
Fax : +82-70-8799-8419
E-mail : heoej@krs.co.kr
Person in charge : Heo Eun-jung

To :

No : 2020-5-E
Date : 26.Jun.2020

Subject	9.134 Guidance for Exhaust gas Emission Abatement System
Application	01.Jul.2020 or 01.Jan.2021

1. Please be informed that the amendments have been made the following KR Technical Rules 2020 as attachment to reflect IACS Resolution which is to be applied on or after 1 January 2021 and Request for Establishment/Revision of Classification Technical Rules which is to be applied on or after 1 July 2020. And you are kindly requested to apply the amendments on the relevant works according to effective date.

Amended KR Technical Rules	Effective Date	Reflected requests for Revision
Guidance for Exhaust gas Emission Abatement System	The contract date for ship construction on or after 1.Jul. 2020	To reflect result of internal review (Request for Revision)
	The contract date for ship construction or the submission date of plans on or after 1.Jan. 2021	IACS UR M77(Rev.1 Aug 2019)

2. Furthermore, please be informed that the establishment will be included in 2021 edition on KR Technical Rules which will be published in the first half of 2021.

Attachments: Amended KR Technical Rules (K/E) --- each 1 copy (The End).

Amendments of Guidance for Exhaust Gas Emission Abatement System

2020.06.



- Main Amendments -

(1) Effective date : 1 July 2020(date of which contracts for construction are signed)

● Section 2 Exhaust Gas Recirculation system(EGR)

- Request for Establish/Revision of Classification Technical Rules(ENP4500-3284-2020) has been reflected.

● Section 3 Exhaust Gas Cleaning system(EGC)

- Request for Establish/Revision of Classification Technical Rules(ENP4500-3284-2020) has been reflected.

(2) Effective date : 1 January 2021(submission date of plans or date of which contracts for construction are signed)

● Section 1 Selective Catalytic Reduction System Using Ammonia Solutions or Urea Solutions as the Reductant Agents(SCR)

- The amendments to IACS UR M77(Rev.1 Aug 2019) "Storage and Use of SCR Reductants" have been reflected.

Present	Amendment
<p style="text-align: center;">Section 1 Selective Catalytic Reduction system Using Ammonia Solutions or Urea Solutions as the Reductant Agents(SCR)</p> <p>101. ~ 103. <omitted></p> <p>104. System design</p> <p>1. <omitted></p> <p>2. SCR system</p> <p>(1) ~ (2) <omitted></p> <p>(3) Storage and Supply system of reductant agents</p> <p>(A) <omitted></p> <p>(B) Closing and Shut-off devices</p> <p>(a) <u>Reductant agent pipes, which, if damaged, would allow reductant agent to escape from a storage tank situated above the double bottom, are to be fitted with a cock or valve directly on the tank capable of being closed from a safe position outside the space concerned in the event of a fire occurring in the space in which such tanks are situated. In the special case of deep tanks situated in any shaft or pipe tunnel or similar space, valves on the tank are to be fitted, but control in the event of fire may be effected by means of an additional valve on the pipe or pipes outside the tunnel or similar space. If such an additional valve is fitted in a machinery space, it is to be operated from a position outside this space.</u></p> <p>(b) ~ (c) <omitted></p> <p>(4) <omitted></p> <p>105. Special requirements in cases where the urea solution is used as reductant agent</p> <p>1. Urea solution storage tank</p> <p>(1) ~ (3) <omitted></p> <p>(4) Where urea based ammonia solution is stored in integral tanks, the following are to be considered during the design and construction:</p> <p>(A) ~ (C) <omitted></p> <p>(D) <u>These tanks are to be fitted with but not limited to level gauge, temperature gauge, high temperature alarm, low level alarm, etc.</u></p>	<p style="text-align: center;">Section 1 Selective Catalytic Reduction system Using Ammonia Solutions or Urea Solutions as the Reductant Agents(SCR)</p> <p>101. ~ 103. <same as the present></p> <p>104. System design</p> <p>1. <omitted></p> <p>2. SCR system</p> <p>(1) ~ (2) <omitted></p> <p>(3) Storage and Supply system of reductant agents</p> <p>(A) <omitted></p> <p>(B) Closing and Shut-off devices</p> <p>(a) Reductant agent pipes, which, if damaged, would allow reductant agent to escape from a storage tank situated above the double bottom, are to be fitted with a cock or valve directly on the tank capable of being closed from a safe position outside the space concerned in the event of a fire occurring in the space in which such tanks are situated. In the special case of deep tanks situated in any shaft or pipe tunnel or similar space, valves on the tank are to be fitted, but control in the event of fire may be effected by means of an additional valve on the pipe or pipes outside the tunnel or similar space. If such an additional valve is fitted in a machinery space, it is to be operated from a position outside this space.</p> <p>(a) ~ (b) <omitted></p> <p>(4) <omitted></p> <p>105. Special requirements in cases where the urea solution is used as reductant agent</p> <p>1. Urea solution storage tank</p> <p>(1) ~ (3) <same as the present></p> <p>(4) Where urea based ammonia solution is stored in integral tanks, the following are to be considered during the design and construction: (2020)</p> <p>(A) ~ (C) <same as the present></p> <p>(D) These tanks are to be fitted with but not limited to level gauge, temperature gauge, high temperature alarm, low level alarm, etc.</p>

Present	Amendment
<p>(E) These tanks are to be included in the ship's stability calculation.</p> <p>(5) <omitted></p> <p>(6) Urea storage tanks are to be arranged so that they can be emptied of urea, <u>purged and vented.</u></p> <p>2. Ventilation</p> <p>(1) If a urea storage tank is installed in a closed compartment, the area is to be served by an effective mechanical <u>supply and exhaust ventilation system</u> providing not less than 6 air changes per hour which is independent from the ventilation system of accommodation, service spaces, or control stations. The ventilation system is to be capable of being controlled from outside the compartment <u>and is to be maintained in operation continuously except when the storage tank is empty and has been thoroughly air purged.</u> If the ventilation stops, an audible and visual alarm shall be provided outside the compartment adjacent to each point of entry and inside the compartment, together with a warning notice requiring the use of such ventilation.</p> <p>Alternatively, where a urea storage tank is located within an engine room a separate ventilation system is not required when the general ventilation system for the space is arranged so as to provide an effective movement of air in the vicinity of the storage tank and is to be maintained in operation continuously except when the storage tank is empty and has been thoroughly <u>air purged.</u></p> <p>(2) <u>In the follow case, the closed compartments normally entered by persons are 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 accommodation, service spaces, or control stations. 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 : (2020)</u></p> <p>(A) <u>When the urea piping systems pass through these compartments, unless the piping system is made of steel or other equivalent material with melting point above 925 °C and with fully welded joints.; or</u></p>	<p>(D) These tanks are to be included in the ship's stability calculation.</p> <p>(5) <same as the present></p> <p>(6) Urea storage tanks are to be arranged so that they can be emptied of urea, <u>and ventilated by means of portable or permanent systems. (2020)</u></p> <p>2. Ventilation (2020)</p> <p>(1) If a urea storage tank is installed in a closed compartment, the area is to be served by an effective mechanical <u>ventilation system of extraction type</u> providing not less than 6 air changes per hour which is independent from the ventilation system of accommodation, service spaces, or control stations. The ventilation system is to be capable of being controlled from outside the compartment. <u>A warning notice requiring the use of such ventilation before entering the compartment shall be provided outside the compartment adjacent to each point of entry.</u> Alternatively, where a urea storage tank is located within an engine room a separate ventilation system is not required when the general ventilation system for the space is arranged so as to provide an effective movement of air in the vicinity of the storage tank and is to be maintained in operation continuously except when the storage tank is empty and has been thoroughly <u>ventilated. (2020)</u></p> <p>(2) <u>The requirements specified in (1) also apply to closed compartments normally entered by persons:</u></p> <p>(A) <u>When they are adjacent to the urea integral tanks and there are possible leak points (e.g. manhole, fittings) from these tanks.; or</u></p>

Present	Amendment
<p><u>(B) When they are adjacent to the urea integral tanks and there are possible leak points (e.g. manhole, fittings) from these tanks.</u></p> <p>3. Piping system and venting system of urea solution storage tank</p> <p>(1) The reductant piping and venting systems are to be independent of other ship service piping and/or systems. Reductant piping systems are not to be located in accommodation, service spaces, or control stations. The vent pipes of the storage tank are to terminate in a safe location on the weather deck and the tank venting system is to be arranged to prevent entrance of water into the urea tank.</p> <p><u>(2) Reductant related piping systems, tanks, and other components which may come into contact with the reductant solution are to be of a suitable grade of non-combustible compatible material established to be suitable for the application.</u></p> <p>4. Safety & Protective equipment</p> <p>(1) For the protection of crew members, the <u>vessel shall</u> have on board suitable protective equipment consisting of large aprons, rubber gloves with long sleeves, rubber boots, coveralls of chemical-resistant material, and tight-fitting chemical safety goggles or face shields or both. And, the quantity to be supplied is to be at least two sets.</p> <p><u>(2) Eyewasher and safety showers are to be provided near the bunker manifold and the process fluid transfer pump. If several bunker manifolds are installed on the same deck, one could be installed if the bunker manifold can be easily accessed to <u>eyewasher and safety shower</u> from the bunker manifold. The treatment fluid transfer pump can be applied in the same manner as the bunker manifold.</u></p> <p>⟨hereafter, omitted⟩</p>	<p><u>(B) When the urea piping systems pass through these compartments, unless the piping system is made of steel or other equivalent material with melting point above 925 °C and with fully welded joints.</u></p> <p>3. Piping system and venting system of urea solution storage tank</p> <p>(1) The reductant piping and venting systems are to be independent of other ship service piping and/or systems. Reductant piping systems are not to be located in accommodation, service spaces, or control stations. The vent pipes of the storage tank are to terminate in a safe location on the weather deck and the tank venting system is to be arranged to prevent entrance of water into the urea tank.</p> <p><u>(2) Reductant tanks are to be of steel or other equivalent material with a melting point above 925°C. Pipes/piping systems are to be of steel or other equivalent material with melting point above 925°C, except downstream of the tank valve, provided this valve is metal seated and arranged as fail-to-closed or with quick closing from a safe position outside the space in the event of fire; in such case, type approved plastic piping may be accepted even if it has not passed a fire endurance test. Reductant tanks and pipes/piping systems are to be made with a material compatible with reductant or coated with appropriate anti-corrosion coating. (2020)</u></p> <p>4. Safety & Protective equipment</p> <p>(1) For the protection of crew members, the <u>ship is to</u> have on board suitable protective equipment consisting of large aprons, rubber gloves with long sleeves, rubber boots, coveralls of chemical-resistant material, and tight-fitting chemical safety goggles or face shields or both. And, the quantity to be supplied is to be at least two sets. <u>(2020)</u></p> <p><u>(2) Eyewasher is to be provided near the bunker manifold and the process fluid transfer pump. If several bunker manifolds are installed on the same deck, one could be installed if the bunker manifold can be easily accessed to <u>eyewasher</u> from the bunker manifold. The treatment fluid transfer pump can be applied in the same manner as the bunker manifold. (2020)</u></p> <p>⟨hereafter, same as the present⟩</p>

Present	Amendment
<p style="text-align: center;">Section 2 Exhaust Gas Recirculation system(EGR)</p> <p>201. ~ 205. <omitted></p> <p>206. EGR System Piping</p> <p>1. <omitted></p> <p>2. Washwater Piping</p> <p>(1) ~ (2) <omitted></p> <p>(3) Overboard Discharges</p> <p>(A) <omitted></p> <p>(B) Special attention is to be paid to the corrosion resistivity of EGR washwater overboard discharge piping. Where applicable, adequate arrangements are to be provided to prevent galvanic corrosion due to the use of dissimilar metals.</p> <p>(C) The distance piece between the outboard discharge valve and the shell plating is not to be less than Sch.160 or 15mm, whichever is smaller and it is to be coated with corrosion-resistant materials established to be suitable for the application. <u>However, if the material is of a suitable grade of stainless steel, the thickness may be reduced. (2020)</u></p> <p>(D) <omitted></p>	<p style="text-align: center;">Section 2 Exhaust Gas Recirculation system(EGR)</p> <p>201. ~ 205. <same as the present></p> <p>206. EGR System Piping</p> <p>1. <same as the present></p> <p>2. Washwater Piping</p> <p>(1) ~ (2) <same as the present></p> <p>(3) Overboard Discharges</p> <p>(A) <same as the present></p> <p>(B) Special attention is to be paid to the corrosion resistivity of EGR washwater overboard discharge piping. Where applicable, adequate arrangements are to be provided to prevent galvanic corrosion due to the use of dissimilar metals and <u>the welding oxides of piping are to be removed. (2020)</u></p> <p>(C) The distance piece between the outboard discharge valve and the shell plating is not to be less than Sch.160 or 15mm, whichever is smaller and it is to be <u>used or coated with high corrosion resistant materials established to be suitable for the application such as acidity and temperature. Instead of coating, high corrosive resistant steel (ex. super duplex stainless steel) may be fitted internally such as sleeve or lining. In the case of a welding that may damage the passive film, the welding parts are to be passivated. Application of alternative methods is to be agreed by the Society. When considered necessary by the Society, data for suitability of coating or high corrosion resistant materials is to be submitted additionally. (2020)</u></p> <p>(D) <same as the present></p>

Present	Amendment
<p style="text-align: center;">Section 3 Exhaust Gas Cleaning system(EGC)</p> <p>301. ~ 305. <omitted></p> <p>306. EGR System Piping</p> <p>1. <omitted></p> <p>2. Washwater Piping</p> <p>(1) ~ (2) <omitted></p> <p>(3) Overboard Discharges</p> <p>(A) <omitted></p> <p>(B) Special attention is to be paid to the corrosion resistivity of EGR washwater overboard discharge piping. Where applicable, adequate arrangements are to be provided to prevent galvanic corrosion due to the use of dissimilar metals.</p> <p>(C) The distance piece between the outboard discharge valve and the shell plating is not to be less than Sch.160 or 15mm, whichever is smaller and it is to be coated with corrosion-resistant materials established to be suitable for the application. <u>However, if the material is of a suitable grade of stainless steel, the thickness may be reduced. (2020)</u></p> <p>(D) <omitted></p>	<p style="text-align: center;">Section 3 Exhaust Gas Cleaning system(EGC)</p> <p>301. ~ 305. <same as the present></p> <p>306. EGC System Piping</p> <p>1. <same as the present></p> <p>2. Washwater Piping</p> <p>(1) ~ (2) <same as the present></p> <p>(3) Overboard Discharges</p> <p>(A) <same as the present></p> <p>(B) Special attention is to be paid to the corrosion resistivity of EGR washwater overboard discharge piping. Where applicable, adequate arrangements are to be provided to prevent galvanic corrosion due to the use of dissimilar metals and <u>the welding oxides of piping are to be removed. (2020)</u></p> <p>(C) The distance piece between the outboard discharge valve and the shell plating is not to be less than Sch.160 or 15mm, whichever is smaller and it is to be <u>used or coated with high corrosion resistant materials established to be suitable for the application such as acidity and temperature. Instead of coating, high corrosive resistant steel (ex. super duplex stainless steel) may be fitted internally such as sleeve or lining. In the case of a welding that may damage the passive film, the welding parts are to be passivated. Application of alternative methods is to be agreed by the Society. When considered necessary by the Society, data for suitability of coating or high corrosion resistant materials is to be submitted additionally. (2020)</u></p> <p>(D) <same as the present></p>