INFORMATION ON UPCOMING IACS REQUIREMENTS

AUGUST 2023

INDIAN REGISTER OF SHIPPING

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UNIFIED REQUIREMENTS

UR M81- "Safety Measures against Chemical Treatment Fluids Used for Exhaust Gas Cleaning Systems and Hazardous Residue", Rev.1

Overview:

This UR provides minimum technical requirements for exhaust gas cleaning systems (EGCS) employing chemical treatment fluids and hazardous residues.

Implementation Date:

Rev.1 is set for uniform implementation by IACS Societies for EGCS in two scenarios:

i) For applications seeking installation made on or after 1 July 2024.

ii) For installations in ships contracted for construction on or after 1 July 2024.

Background on Rev.1:

In response to recent corrosion incidents within EGCS discharge lines, especially in distance pieces, IACS has revised UR M81 to address these concerns. These corrosion issues resulted in engine room flooding due to corroded overboard distance pieces on hull shell plating. Consequently, new requirements have been introduced specifying that distance pieces should be made of steel (not plastic) and require protective measures like sleeves and coatings to counter bare carbon steel's vulnerability to corrosion. Various classification societies have already embraced measures like a minimum pipe thickness of 15 mm or sch.160 to combat corrosion, which is widely accepted. Similarly, corrosion-resistant steel distance pieces can have a minimum thickness of 12 mm.

Changes in Rev.1:

M81.3: This section introduces new requirements for discharge lines. It stipulates EGCS discharges must not connect with other systems. Due consideration is to be given during design to avoid discharge onto propellers, thrusters, survival crafts, etc. Material for EGCS discharge pipe should be selected based on corrosive nature of the liquid media. Use of corrosion-resistant steel or coatings for distance pieces between outboard discharge valve and shell plating is now specified, with thickness requirements also stipulated.

Potential Impacts:

UR M81, Rev.1, requires shipbuilders to incorporate updated criteria into their design, procurement, and construction processes for EGCS installations to prevent corrosion-related incidents and associated risks. Further, EGCS manufacturers must adjust their design, production, and installation approaches to meet the new requirements.

(Click here for UR M81, Rev.1)

UNIFIED INTERPRETATIONS

UI SC123 – "Machinery Installations- Service Tank Arrangements", Rev.5

Overview:

This Unified Interpretation provides comprehensive guidance for arranging service tanks in maritime machinery installations for fuel oil use. The interpretation outlines equivalent compliance options in accordance with SOLAS Regulation II-1/26.11.

Implementation Date:

Rev.5, published by IACS in July 2023, will be uniformly enforced by IACS Members on ships contracted for construction on or after 1 July 2024.

Technical Background on Rev.5:

NA

Changes in Rev.5:

IACS has provided a new explanatory footnote within the current revision, considering MDO characteristics. This footnote clarifies equivalent service tank arrangements (examples 1.2 and 2.2) and highlights that fuel oils needing post-service tank heating for injection viscosity shouldn't be classified as MDO. The Footnotes are integrated into paragraphs 1.2 and 2.2.

Potential Impacts:

Shipbuilders and Shipowners should note the interpretation and apply arrangements according to the characteristics of the fuel.

(Click here for UI SC123, Rev.5)

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M81 Safety measures against chemical treatment fluids used for exhaust gas cleaning systems and the residues which have hazardous properties

(Jan 2021) (Rev.1 July 2023)

1. General

1.1 With regard to regulation 14 of MARPOL Annex VI requiring ships to use fuel oil with a sulphur content not exceeding that stipulated in regulations 14.1 or 14.4, regulation 4 allows, with the approval of the Administration, the use of an alternative compliance method at least as effective in terms of emission reductions as that required by the MARPOL Annex VI, including the standards set forth in regulation 14.

1.2 As some types of exhaust gas cleaning systems to be approved by the Administration as “alternative compliance method” consume chemicals which are typically carried on board in bulk quantities, the prescriptive requirements contained in this UR related safety measures against chemical treatment fluids apply to exhaust gas cleaning systems using such fluids. In this context, the term “chemical treatment fluid” means the aqueous solution of sodium hydroxide (NaOH) or calcium hydroxide ($Ca(OH)_2$) that has corrosive properties or are considered to represent a hazard to personnel (See section 2 of this UR).

1.3 For exhaust gas cleaning systems using chemicals other than the above, safety measures are to be taken according to the result of a risk assessment to be conducted to analyze the risks, in order to eliminate or mitigate the hazards to personnel brought by the use of such exhaust gas cleaning systems, to an extent equivalent to systems complying with M81 2.1 to M81 2.16.

Note:

1. This UR is to be uniformly implemented by IACS Societies for EGCS:

   i) when an application for installation, i.e. submission date of plans, is made on or after 1 July 2022; or

   ii) which is installed in ships contracted for construction on or after 1 July 2022.

2. Rev.1 of this UR is to be uniformly implemented by IACS Societies for EGCS:

   i) when an application for installation, i.e. submission date of plans, is made on or after 01 July 2024; or

   ii) which is installed in ships contracted for construction on or after 01 July 2024.

3~~2~~. The “contracted for construction” date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of “contract for construction”, refer to IACS Procedural Requirement (PR) No. 29.

M81 (cont)

2. Requirements for exhaust gas cleaning systems using aqueous solution of NaOH or $Ca(OH)_2$ for chemical treatment fluid

2.1 The storage tank for chemical treatment fluids is to be arranged so that any leakage will be contained and prevented from making contact with heated surfaces. All pipes or other tank penetrations are to be provided with manual closing valves attached to the tank. In cases where such valves are provided below top of tank, they are to be arranged with quick acting shutoff valves which are to be capable of being remotely operated from a position accessible even in the event of chemical treatment fluid leakages. Tank and piping arrangements are to be approved.

2.2 The storage tank is to be protected from excessively high or low temperatures applicable to the particular concentration chemical treatment fluids. Depending on the operational area of the ship, this may necessitate the fitting of heating and/or cooling systems.

2.3 If a storage tank 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 other spaces ~~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 shall be provided outside the compartment adjacent to each point of entry.

2.4 The storage tank may be located within the engine room. In this case, the requirements of 2.3 shall be complied with, except that a separate ventilation system is not required when the general ventilation system for the space ~~providing not less than 6 air changes per hour~~ is arranged so as to provide an effective movement of air in the vicinity of the storage tank and is maintained in operation continuously except when the storage tank is empty and has been thoroughly ventilated.

2.5 Each storage tank for chemical treatment fluids is to be provided with level monitoring arrangements and high/low level alarms. In cases where heating and/or cooling systems are provided, high and/or low temperature alarms or temperature monitoring are also to be provided accordingly.

2.6 The storage tanks are to have sufficient strength to withstand a pressure corresponding to the maximum height of a fluid column in the overflow pipe, with a minimum of 2.4 m above the top plate taking into consideration the specific density of the treatment fluid.

2.7 Where chemical treatment fluid is stored in integral tanks, the following are to be considered during the design and construction:

.1 These tanks may be designed and constructed as integral part of the hull, (e.g. double bottom, wing tanks).

.2 These tanks are to be coated with appropriate anti-corrosion coating and are to be segregated by cofferdams, void spaces, pump rooms, empty tanks or other similar spaces so as to not be located adjacent to accommodation, cargo spaces containing cargoes which react with chemical treatment fluids in a hazardous manner as well as any food stores, oil tanks and fresh water tanks.

.3 These tanks are to be designed and constructed as per the structural requirements applicable to hull and primary support members for a deep tank construction.

M81 (cont)

.4 These tanks are to be included in the ship's stability calculation.

2.8 The requirements specified in M81 2.3 also apply to closed compartments normally entered by persons:

.1 when they are adjacent to the integral storage tank for chemical treatment fluids and there are possible leak points (e.g. manhole, fittings) from these tanks; or

.2 when the treatment fluid piping systems pass through these compartments, unless the piping system is made of steel or other equivalent material with melting point above 925 degrees C and with fully welded joints.

2.9 The chemical treatment fluid piping and venting systems are to be independent of other ship service piping and/or systems. The chemical treatment fluid 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 tank for chemical treatment fluids.

2.10 Storage tanks and pipes/piping systems and drip trays 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 degrees C.

2.11 Storage tanks and pipes/piping systems for chemical treatment fluids are to be made with a material compatible with chemical treatment fluids, or coated with appropriate anti-corrosion coating.

Footnote:
Several metals are incompatible with the chemical treatment fluids, e.g. NaOH is incompatible with zinc, aluminum, etc.

2.12 Regardless of design pressure and temperature, piping systems containing chemical treatment fluids only are to comply with the requirements applicable to Class I piping systems. As far as practicable, e.g. except for the flange connections that connect to tank valves, the piping systems are to be joined by welding.

2.13 The following connections are to be screened and fitted with drip trays to prevent the spread of any spillage where they are installed:

.1 Detachable connections between pipes (flanged connections and mechanical joints, etc.);

.2 Detachable connections between pipes and equipment such as pumps, strainers, heaters, valves; and

.3 Detachable connections between equipment mentioned in the above sub-paragraph.

The drip trays are to be fitted with drain pipes which lead to appropriate tanks, such as residue tanks, which are fitted with high level alarm. Otherwise, the drip trays are to be fitted with alarms for leak detection. In cases where such tank is an integral tank, M81 2.7.1 and M81 2.7.2 are to be applied to the tank.

2.14 For the protection of crew members, the ship is to have on board suitable personnel protective equipment. The number of personnel protective equipment carried onboard is to be

M81 (cont)

appropriate for the number of personnel engaged in regular handling operations or that may be exposed in the event of a failure; but in no case is there to be less than two sets available onboard.

2.15 Personnel protective equipment is to consist of protective clothing, boots, gloves and tight-fitting goggles.

Eyewash and safety showers are to be provided, the location and number of these eyewash stations and safety showers are to be derived from the detailed installation arrangements. As a minimum, the following stations are to be provided:

.1 In the vicinity of transfer or treatment pump locations. If there are multiple transfer or treatment pump locations on the same deck then one eyewash and safety shower station may be considered for acceptance provided that the station is easily accessible from all such pump locations on the same deck.

.2 An eyewash station and safety shower is to be provided in the vicinity of a chemical bunkering station on-deck. If the bunkering connections are located on both port and starboard sides, then consideration is to be given to providing two eyewash stations and safety showers, one for each side.

.3 An eyewash station and safety shower is to be provided in the vicinity of any part of the system where a spillage/drainage may occur and in the vicinity of system connections/components that require periodic maintenance.

2.16 Storage tanks for chemical treatment fluids are to be arranged so that they can be safely emptied of the fluids and ventilated by means of portable or permanent systems.

3. Requirement for Exhaust Gas Cleaning Systems discharge water pipeline

3.1 Overboard discharges from exhaust gas cleaning system (EGCS) are not to be interconnected to other systems.

3.2 Due consideration is to be given to the location of overboard discharges with respect to vessel propulsion features, such as thrusters, propellers or to prevent any discharge water onto survival craft during abandonment.

3.3 The piping material for the EGCS discharge water pipeline system is to be selected based on the corrosive nature of the liquid media.

3.4 Special attention is to be paid to the corrosion resistivity of EGCS overboard discharge piping. Where applicable, adequate arrangements are to be provided to prevent galvanic corrosion due to the use of dissimilar metals.

3.5 In case distance piece is fitted between the outboard discharge valve and the shell plating, it shall be made of corrosion resistant material steel or be coated with an anti-corrosive material suitable for the operating environment. The thickness of the distance piece shall be at least the minimum values specified in .1 and .2 as below; otherwise Sch.160 thickness specified in piping standards shall, as far as practicable, be used.

.1 12 mm in cases where complete pipe is made of corrosion resistant material steel.

.2 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.

M81
(cont)

~~3~~4. Miscellaneous

~~3~~4.1 Tanks for residues generated from the exhaust gas cleaning process are to satisfy the following requirements:

.1 The tanks are to be independent from other tanks, except in cases where these tanks are also used as the overflow tanks for chemical treatment fluids storage tank.

.2 Tank capacities are to be decided in consideration of the number and kinds of installed exhaust gas cleaning systems as well as the maximum number of days between ports where residue can be discharged ashore. In the absence of precise data, a figure of 30 days is to be used.

.3 Where residue tanks used in closed loop chemical treatment systems are also used as the overflow tanks for chemical treatment fluids storage tank, the requirements for storage tanks apply.

End of Document

SC 123 (1998) (Rev.1 Apr 1998) (Rev.2 June 2002) (Rev.3 Dec 2005) (Rev.4 Nov 2018 Withdrawn and Rev.3 reinstated Nov 2019) (Corr.1 Feb 2022) (Rev.5 July 2023)

Machinery Installations - Service Tank Arrangements

Reg. II-1/26.11

SOLAS Regulation II-1/26.11 states:

*Two fuel oil service tanks for each **type of fuel** used on board necessary for propulsion and vital systems or **equivalent arrangements** shall be provided on each new ship, with a capacity of at least 8 h at maximum continuous rating of the propulsion plant and normal operating load at sea of the generator plant.*

Interpretation

Arrangements complying with this regulation and acceptable “equivalent arrangements”, for the most commonly utilised fuel systems, are shown below.

A service tank is a fuel oil tank which contains only fuel of a quality ready for use i.e. fuel of a grade and quality that meet the specification required by the equipment manufacturer. A service tank is to be declared as such and not to be used for any other purpose.

Use of a setting tank with or without purifiers, or purifiers alone, and one service tank is not acceptable as an “equivalent arrangement” to two service tanks.

Notes:

1. This Unified Interpretation is to be applied by IACS Members and Associates to all ships subject to the relevant SOLAS Regulation.

2. Changes introduced in Rev.2 are to be uniformly implemented by IACS Members and Associates from 1 January 2003.

3. Changes introduced in Rev.3 are to be uniformly implemented by IACS Members and Associate from 1 July 2006.

4. Rev.4 of this UI is withdrawn prior to coming into force on 1 January 2020 and Rev.3 of this UI is reinstated on Nov 2019.

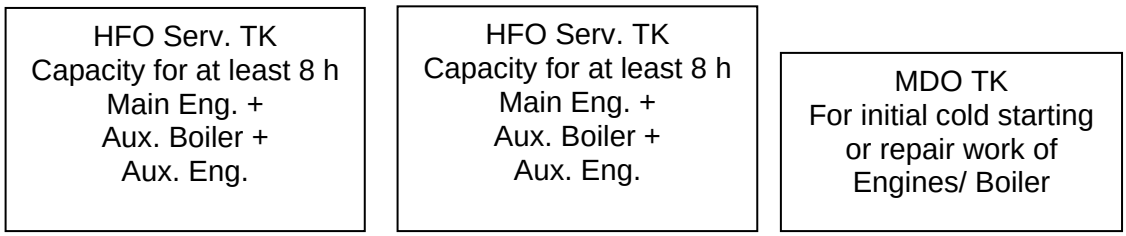
5. Rev.5 of this UI is to be uniformly implemented by IACS Members on ships contracted for construction on or after 1 July 2024.

6. The “contracted for construction” date means the date on which the contract to build the vessel is signed between the prospective owner and shipbuilder. For further details regarding the date of “contract for construction”, refer to IACS Procedural Requirement (PR) No. 29.

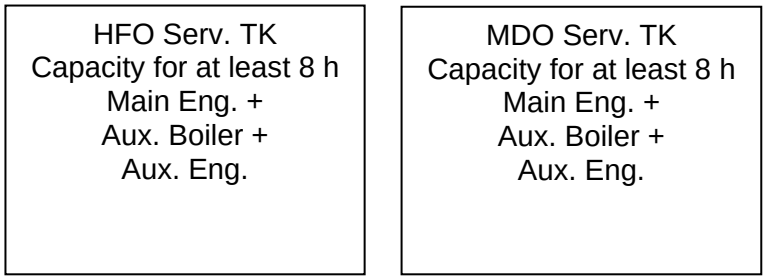
SC 123 (cont)

1. Example 1

1.1 Requirement according to SOLAS - Main and Auxiliary Engines and Boiler(s) operating with Heavy Fuel Oil (HFO) (one fuel ship)



1.2 Equivalent arrangement [(1)]



This arrangement only applies where main and auxiliary engines can operate with heavy fuel oil under all load conditions and, in the case of main engines, during manoeuvring.

For pilot burners of Auxiliary Boilers if provided, an additional MDO tank for 8 hours may be necessary.

[(1)] Any fuel oil which requires post service tank heating to achieve the required injection viscosity is not regarded in this context as MDO.

SC 123 (cont)

2. Example 2

2.1 Requirement according to SOLAS - Main Engine(s) and Auxiliary Boiler(s) operating with HFO and Auxiliary Engine operating with Marine Diesel Oil (MDO)

HFO Serv. TK Capacity for at least 8 h Main Eng.+ Aux. Boiler	HFO Serv. TK Capacity for at least 8 h Main Eng.+ Aux. Boiler	MDO Serv. TK Capacity for at least 8 h Aux. Eng.	MDO Serv. TK Capacity for at least 8 h Aux. Eng.

2.2 Equivalent arrangement [(2)]

HFO Serv. TK Capacity for at least 8 h Main Eng.+ Aux. Boiler	MDO Serv. TK Capacity for at least the highest of: 4 h Main Eng. +Aux. Eng. +Aux. Boiler or 8 h Aux. Eng. + Aux. Boiler	MDO Serv. TK Capacity for at least the highest of: 4 h Main Eng. +Aux. Eng. + Aux. Boiler or 8 h Aux. Eng. + Aux. Boiler

3. The arrangements in 1.2 and 2.2 apply, provided the propulsion and vital systems which use two types of fuel support rapid fuel changeover and are capable of operating in all normal operating conditions at sea with both types of fuel (MDO and HFO).

End of Document

[(2)] See footnote 1.