
M86 Monitoring and Safety Functions for Exhaust Gas Cleaning (SO_x) Systems

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1. General

Marine air pollution regulations typically require the use of low-sulfur fuel in order to reduce SO_x gaseous emissions. The use of Exhaust Gas Cleaning Systems (EGCS) technology is generally permitted as an alternative means of compliance. EGCS – SO_x Scrubbers can be effective in complying with regulations that require the use of 0.5 percent sulfur fuel globally and 0.1 percent in Emission Control Areas (ECA). The following requirements apply to the arrangements intended for the safeguard of the ship in case of malfunction of the EGCS.

2. Exhaust Bypass

The EGCS bypass arrangement is to be provided in order to continue the operation of the engines. The arrangement is to be operated automatically in accordance with Table 1 of Section 5. The bypass arrangement may be omitted, provided the EGCS is designed for dry operation and the lack of the bypass arrangement does not interfere with the continuous operation of the engine.

In installations with individually controlled bypass and uptake dampers, an interlock is required to prevent both dampers from being closed at the same time. The interlock can comprise a pressure sensor upstream of the dampers, interfaced to the EGCS safety system, opening the bypass damper in case of high back pressure.

3. Control and Monitoring System

Automatic control, monitoring (including washwater discharge criteria), alarm, and safety functions are to be provided for the EGCS so that operations remain within preset parameters for all fuel oil combustion unit(s) and SO_x emission abatement system operating conditions.

The control system for the exhaust gas cleaning system may be connected to an integrated control system or may be a standalone system. The system is to be designed such that a single fault of a component will not lead to a potentially dangerous situation for human safety and/or the vessel. An FMEA, or equivalent, demonstrating the safety system design basis is to be submitted to the classification society, when the control system is connected to an integrated control system of a vessel.

For vessels with unmanned propulsion machinery space, the alarm and monitoring systems of the EGCS can be integrated in the vessel's centralized monitoring systems.

Note:

1. This Unified Requirement is to be uniformly implemented by IACS Societies on ships contracted for construction on and after 1 January 2026.
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.

4. Safety Shutdown System

A safety shutdown system is to be provided. The safety system is to be designed as far as is practicable to operate independently of the control and alarm systems mentioned in section 3, such that failures or malfunctions in the control and alarm systems will not prevent the safety system from operating:

- i) Upon activation of the safety shutdown system, visual and audible alarms are to be indicated at both the local and remote control positions. Visual alarms are to include a means of indicating the parameters causing shutdown.
- ii) In addition to the automatic shutdown system, manual emergency shutdown arrangements are to be provided at both the local and remote the control positions.
- iii) In the event where shutdown by the safety shutdown system is activated, the restart should not occur automatically, unless after the system is manually reset.
- iv) Safety shutdown is to be automatically activated for the conditions in Table 1 of section 5.

5. Monitored Parameters

Table 1 Parameters for indication, alarm and safety functions

<i>Monitored Parameters</i>	Gr 1		Gr 2
	<i>Indication at control position(s)</i>	<i>Alarm Activation</i>	<i>Automatic EGC Shutdown with alarm and EGC Bypass ¹</i>
Exhaust gas temperature after EGC unit	X	High	X (High-High)
Pressure before the EGC unit and/or Differential pressure across EGC unit ²	X	High	X (High-High)
Water level in wet EGC unit		High	X (High-High)
EGC exhaust fan/blower motors ³	Running	Stop	
EGC exhaust bypass, isolation, mixing valves, where provided	Position ⁴		
Operation of EGC washwater pumps or washwater system supply pressure	Running X	Stop Low	
Chemical treatment fluid storage tank temperature		Low/High ⁵	
Chemical treatment fluid storage tank level		Low/High ⁵	
Chemical treatment fluid leakage detection in system drip tray or drain / residue tank		X ⁶	

Gr 1 Common sensor for indication and alarm

Gr 2 Sensor for shut down and bypass

Notes:

1. Automatic stopping of all EGCS pumps. Automatic bypass of the EGC unit is required when the EGC unit is not suitable for operation in the dry condition.
2. As applicable in accordance with the specific EGC system design and installation.
3. If applied.
4. See section 2 "Exhaust Bypass".
5. UR M81.2.5
6. If necessary, UR M81.2.13

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