

Rule Clarification – Fixed Fire-Extinguishing Systems That May Be Considered as Equivalent to a Fixed CO₂ System

Interim Technical Note (ITN-01-21)

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General

Interim Technical Notes (ITNs) provide supporting information on specific technical issues or areas related to maritime rules or marine protection rules. The material in this ITN should not be treated as a substitute for the rules, which are the law. This ITN may be replaced with or clarified by operational guidance or an advisory circular at a later date.

Purpose and Application

This ITN clarifies when fixed fire-fighting systems that do not use CO₂ may be considered as equivalent to a fixed gas fire-fighting system complying with 42B.20 to 21 (i.e. a CO₂ system). In addition, it provides information about the phase-down of FM200 (HFC-227ea).

Relevant Rules

Maritime Rules Part 42B

Fixed gas fire-fighting systems

42B.20 General

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(17) A fixed gas fire-extinguishing system must comply with rules 42B.21 or 42B.22, as applicable.

42B.21 Carbon dioxide systems

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42B.22 Other or equivalent gas systems

(1) If gas other than carbon dioxide is produced on a ship and is used as a fire-extinguishing medium, it must be a gaseous product of fuel combustion in which the oxygen content, the carbon monoxide content, the corrosive elements and any solid combustible elements have been reduced to a practicable minimum.

(2) If such gas is used as the fire-extinguishing medium in a fixed fire-extinguishing system for the protection of machinery spaces and cargo pump rooms, it must give protection equivalent to that provided by a fixed system using carbon dioxide as the medium. The equivalent fixed gas fire-extinguishing system must comply with the requirements of the International Maritime Organization's Maritime Safety Committee circular MSC/Circ.848 Revised Guidelines for the Approval of Equivalent Fixed Gas Fire-Extinguishing Systems, as referred to in SOLAS 74, for Machinery Spaces and Cargo Pump-Rooms.

(3) If such gas is used as a fire-extinguishing medium for the protection of cargo spaces, except cargo oil tanks, a sufficient quantity of such gas must be available to supply hourly, for a period of 72 hours, a volume of free gas at least equal to 25 percent of the gross volume of the largest space protected in this way.

42B.71 Standards

The Director may determine that a fire appliance meets a standard prescribed by Part 42B, if the Director is satisfied that the appliance—

- (a) complies with a national or international standard different to that prescribed in Part 42B; and
- (b) substantially complies with the standard prescribed in Part 42B.

Clarification

Rules 42B.20 to 22 prescribe requirements for CO2 systems and systems using gaseous product of fuel combustion. According to rule 42B.20(17), a fixed gas fire-extinguishing system must comply with rules 42B.21 or 42B.22.

The rules do not prohibit the use of fixed gas fire-fighting systems using gases other than CO2 as a fire-extinguishing medium. Systems using aerosol as a medium may also be considered as equivalent to a fixed gas system as required by the rule. This is, in principle, provided for in 42B.71.

The following systems may be considered as equivalent to a fixed gas system under 42B.20 to 21 for protection of machinery spaces and cargo pump-rooms, provided that they meet the recommendations in the relevant IMO circulars.

System	For protection of	International Maritime Organization's Maritime Safety Committee circular
Gas system (other than CO2)	Machinery spaces and cargo pump-rooms	MSC/Circ.848 <i>Revised Guidelines for the Approval of Equivalent Fixed Gas Fire-Extinguishing Systems, as Referred to in SOLAS 1974, for Machinery Spaces and Cargo Pump-Rooms</i> , as amended by MSC.1/Circ.1267.
Aerosol system	Machinery spaces	MSC/Circ.1270 <i>Revised Guidelines for the Approval of Fixed Aerosol Fire-Extinguishing Systems Equivalent to Fixed Gas Fire-Extinguishing Systems, as Referred to in SOLAS 1974, for Machinery Spaces</i> , and its corrigendum MSC.1/Circ.1270/Corr.1.

Approval by the Director

Performance standard for gas (other than CO2) or aerosol systems other than these standards may be accepted at the discretion of the Director according to 42B.71.

Recent legislative development and its impact on systems using FM200

New Zealand is a Party of the Vienna Convention for the Protection of the Ozone Layer 1985. The convention aims to protect the ozone layer from modification and protect human health and the environment against its adverse effects. The Montreal Protocol 1987 to the convention and its amendments (before Kigali) included specific measures of controlling the ODSs (ozone depleting substances). Its Kigali Amendment, adopted in 2016, has extended these measures by phasing down the HFCs (hydrofluorocarbons) which are not ODSs but that have high global warming potential. This amendment has been ratified by NZ and came into force on 1 January 2020.

HFC-227ea, also known as FM200, is one of these controlled HFCs, with a “100-year global warming potential¹” of 3,220 (the fifth highest in all of the 18 listed HFCs). FM200 has been in use as a substitute for its ozone-depleting precedents, such as Halon-1211 and 1301.

According to the phase-down timetable, the total production and consumption of these HFCs (all expressed in CO₂ equivalents) in NZ will be reduced by 85 per cent by 2036 (based on the calculated baseline). A potential impact of this phase-down on systems using HFCs as the fire-extinguishing medium is that the supply of the medium to recharge the system may become unavailable, costly, or require exemption from legislation when it's needed after a discharge or in maintenance.

What exactly this means for systems using FM200, as one substance on the list of HFCs under phase-down, will depend on the proportion of consumption it takes among all the listed HFCs, and how the phase-down works out for other HFCs on the list.

More information on New Zealand's HFC phase-down can be found at—

<https://www.mfe.govt.nz/consultation/hydrofluorocarbons-phase-down>

Requirements on importing and exporting HFCs can be found at—

<https://www.epa.govt.nz/industry-areas/hazardous-substances/hfcs/>

The NZ government agency regulating these controlled substances is EPA (Environment Protection Authority). Refer to the Ozone Layer Protection Act 1996 (OLPA) and the Ozone Layer Protection Regulations 1996 (OLPR) for the latest relevant NZ legislation.

¹ Global warming potential (GWP) is a measure of the relative global warming effects of different gases. It assigns a value to the amount of heat trapped by a certain mass of a gas relative to the amount of heat trapped by a similar mass of carbon dioxide over a specific period of time.

Further information on this note may be obtained from:

Postal Address Maritime Systems Assurance
Maritime New Zealand
PO Box 25620
Wellington, 6146
New Zealand

Email MSANT.Request@maritimenz.govt.nz

Phone 0508 225 522 (within New Zealand)
+64 4 473 0111 (outside New Zealand)
