



Marine Safety Center Technical Note

MTN 01-04
16715
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Subj: Automatic Carbon Dioxide (CO₂) Extinguishing Systems for Small Unoccupied Spaces and Machinery Enclosures

1. Purpose: This technical note provides updated guidance regarding the requirements for automatically actuated CO₂ fire suppression systems in small unoccupied spaces and machinery enclosures installed on vessels, mobile offshore drilling units, and floating production facilities.

2. Discussion:

a. The Coast Guard requires that all fixed CO₂ fire extinguishing systems protecting spaces greater than 6000 cubic feet may only be activated using manual (mechanical or pneumatic) releasing controls. The intent is to eliminate the potential of inadvertent system release due to control malfunction, which could present a threat to crewmembers, or unexpected loss of vital machinery systems.

b. The offshore oil industry relies upon modular construction. This is due to the need to complete topside construction on site, as well as accommodating the changing system requirements and ease of maintenance while continuing oil production. These systems include 'skids' which hold self-contained gas turbine, diesel powered electrical generators and natural gas compressors. These are usually protected by an automatically released fixed CO₂ system that is provided as a part of the skid package.

c. Due to excess generating capacity and redundant systems, an unexpected discharge of extinguishing agent within a machinery enclosure for power generation would not likely result in a situation that would jeopardize the vessel. Therefore, the installation of automatically actuated suppression systems for these applications is acceptable where the installation meets the following application criteria:

- i.* The protected space must be less than 6000 cubic feet.
- ii.* Horizontal means of egress from the machinery enclosure to the open deck must be provided.
- iii.* The enclosed space must be unmanned during any operation of the equipment.
- iv.* Means must be provided to prevent the release of CO₂ when the space is occupied.
- v.* The protected space is independent of the hull and installed on an open deck.
- vi.* If the machinery enclosure is installed in an interior location, the potential concentration of CO₂ in that space must be evaluated to ensure that an unsafe environment could not be caused by the CO₂ escaping from the enclosure.

d. All plans and arrangements must be reviewed and approved by the Marine Safety Center and the installation found satisfactory by the cognizant OCMI. The following requirements apply:

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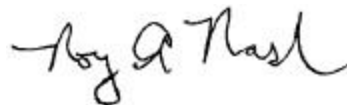
- i.* Type Approval - All fixed CO₂ system equipment must be part of a USCG type approved system, except components for electronic initiated release (see vii below.)
- ii.* Quantity - Required CO₂ quantity is 300 lbs or less. 300 lbs is the minimum amount of CO₂ required for a 6000 cubic foot space. However additional quantities may be provided, e.g. for extended release as per NFPA 12 or as online backup.
- iii.* CO₂ Storage - The CO₂ storage location must be ventilated and designed to prevent an ambient temperature of more than 130 degrees F. CO₂ storage should be outside the protected space and in a location that would be accessible if a fire occurred in the protected space. However, CO₂ storage inside the space is permitted, and if so, the system must be automatically activated.
- iv.* Control and Alarms - Stop/control valve, delay timer and 20 second pre-discharge alarm should be installed, but are not required. If an audible pre-discharge alarm is provided it is to be of an approved type. If present, the audible pre-discharge alarm may be provided within and/or on the exterior of the protected space. Note: In extremely high noise areas, such as inside an unmanned turbine sound dampening enclosure, an audible alarm may not be effective. In such cases, visual alarms, (e.g. strobe or flashing lights) interior and exterior to the protected space should be considered.
- v.* Manual Activation - the system must be able to be manually activated at the CO₂ storage location. If the CO₂ storage location is within the protected space, the system must also be able to be remotely activated at a location as near as practicable but outside one of the main escapes from the space. For vessels required to meet SOLAS, the manual activation must involve a two-step activation (storage cylinder control and manifold valve control.)
- vi.* Automatic Activation - Automatic activation of the system is allowed in addition to the required remote and manual controls, though required only if CO₂ cylinder storage is within the space.
- vii.* Electronic Automatic Activation - if the automatic activation is initiated electronically the following criteria are also applicable:
 - A. The detection system and electrical components of the automatic release system must be UL listed or FM approved for CO₂ releasing device service. If the automatic activation is initiated via pneumatic heat detection, then all components of the system are to be USCG type approved. Automatic activation initiated electronically may also be approved on a case-by-case basis.
 - B. Notices that the space is protected by an automatic CO₂ system must be prominently posted at the space.
 - C. The system must provide indication of fire detection and CO₂ discharge to the main fire alarm panel or other continuously occupied area.

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- D. The system is equipped with a lockout switch at the entrance to the space to allow the automatic activation of the system to be temporarily disabled, e.g. during maintenance.
- E. The lockout switch is to have a status indicator such as a red pilot light to indicate the switch is activated (automatic release feature disabled).
- F. The lockout switch is to also be provided with an instruction as to its use (activation/deactivation).
- G. When the automatic release feature is disabled, all other controls are still activated and functioning, including any valves, alarms etc.
- H. When the automatic release feature is disabled, there is an indication at the control console.
- I. There must be reliable back up power supply. This may be accomplished by methods such as battery (18 hr) or supply from the emergency panel. Supply from the emergency panel is not appropriate if the space protected is the emergency generator.

3. Applicability: The guidelines provided in this technical note apply to systems meeting the application criteria indicated in paragraph 2(c).

4. Action: This technical note will take effect immediately. System approval will be completed on a case-by-case basis. System drawings and supporting information shall be forwarded to the Marine Safety Center for review and approval. Approved plans of vessel installations meeting the aforementioned criteria, will be forwarded to the cognizant OCMI for the final inspection, testing and approval.



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