Vehicle Carrier Safety Forum

Fire Drill Guidelines for Vehicle Carrying Vessels

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Fire Drill Guidelines for Vehicle Carrying Vessels

1. Purpose and Scope

These Guidelines have been developed by the Vehicle Carrier Safety Forum (VCSF) to provide vessel operators with a structured framework for the development and conduct of fire response drills on board vehicle carrying vessels.

They are intended to supplement and be read in conjunction with the Fire Response – High Level Guidelines, and to support effective preparedness for fire incidents through realistic, scenario-based drills.

These Guidelines:

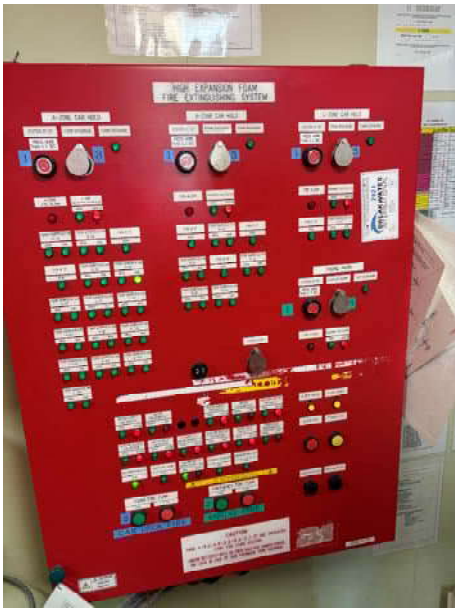
- Are principle-based, not prescriptive, recognising the wide variation in vessel design, equipment, cargo configuration, and trade.
- Do not provide detailed, ship-specific procedures.
- Focus on operational readiness, decision-making, and coordination during fire incidents.
- Should be adapted to incorporate emerging technologies or systems where these are available for use on board.

2. Core Fire Response Principles

The fire drills described in these Guidelines are built around the following core response principles:

- Rapid confirmation of fire after detection (location, extent, and characteristics)
- Fast and effective muster
- Safe deployment of crew
- Early and correct deployment of fixed firefighting systems (FFS)
- Establishment of boundaries and containment
- Effective communication between ship and shore
- Escalation to expert assistance where required

Early suppression using fixed firefighting systems is considered critical to preventing fire escalation on vehicle carrying vessels and is therefore a central focus of all drill scenarios.



High expansion foam system control panel (used for zone discharge)

3. Structure of the Guidelines

The Guidelines are divided into two main sections:

- Section 1 – Fire Drills at Sea
- Section 2 – Fire Drills in Port

Each section contains a series of drill scenarios reflecting increasing levels of complexity and severity, including:

- Fire controlled by initial response
- Fire contained within a fire zone
- Fire not containable

Where appropriate, drills also introduce **table-top exercise (TTX)** elements to address downstream considerations such as expert assistance, salvage, and port of refuge planning. These elements are intended to complement, not replace, company emergency response and shore-side training.

SECTION 1 – FIRE DRILLS AT SEA

Scenario 1.1
Fire Contained by Initial Response

Scenario Objective

To validate the vessel's ability to rapidly confirm a fire, achieve fast muster, safely deploy crew, and deploy fixed firefighting systems promptly, resulting in early containment by shipboard actions alone.

Key Focus Areas

- Fire detection and confirmation
- Bridge team response
- Fast muster
- Early deployment of FFS
- Establishment of boundaries
- Initial communication with shore support

Manual operation instructions and system diagram

Indicative Drill Sequence

- Fire alarm activated; bridge team responds
- Fire location, extent, and conditions confirmed and reported
- Crew muster completed
- Firefighting and rescue tactics agreed
- Fixed firefighting system deployed as soon as reasonably practicable, always with an objective of within 15 minutes of alarm
- Fire team briefed and deployed where safe to do so (e.g. to help assess the status of the fire)
- Communications established with shore support
- Smoke, vapour, gas, and fire boundaries established
- Boundary cooling considered
- Fire controlled by initial actions
- Fire monitoring initiated
- Shore support consulted to assist with ongoing containment and monitoring (including potential vapour cloud management)

Scenario 1.2
Fire Not Controlled by Initial Response but Containable Within a Fire Zone

Scenario Objective

To exercise actions required where a fire is not immediately controlled, but is assessed as containable within defined fire zone boundaries.

Key Focus Areas (in addition to the key focus areas as per 1.1)

- Sustained firefighting effort
- Fire zone integrity
- Boundary management
- Early engagement of external expertise
- Decision-making under escalation pressure

Indicative Drill Sequence

- Initial response as per Scenario 1.1
- Fire assessed as not yet controlled
- Fire team briefed and deployed where safe to do so (e.g. to help assess the status of the fire)
- Smoke, vapour, gas, and fire boundaries established
- Boundary cooling maintained
- Escape routes secured
- Fire assessed as containable within a single fire zone
- TTX element introduced: liaison with 3rd parties such as salvors and firefighting experts
- Fire contained to one deck or fire zone
- TTX continuation: discussion of next steps, including risk of re-ignition and port of refuge considerations

Scenario 1.3
Fire Not Containable Within Fire Zone Boundaries

Scenario Objective

To prepare the vessel's crew and shore support for situations where a fire cannot be contained, requiring escalation to expert assistance and potential abandonment.

Key Focus Areas (in addition to the key focus areas as per 1.1)

- Safety of life and escape route management
- Decision-making under severe escalation
- Transition from firefighting to abandonment readiness
- Integration with shore-side emergency response

Indicative Drill Sequence

- Initial response as per Scenario 1.1
- Fire boundaries established and cooling applied where safe to do so
- Escape routes secured to support potential abandonment
- Fire assessed as uncontainable
- Liaison initiated with salvors and firefighting experts
- Fire spreads beyond a single fire zone
- TTX developed to address expert assistance, salvage strategy, and authority engagement
- Transition to abandon ship drill as appropriate

Notes

- Where deluge or water mist systems are fitted, drills may include scenarios where release is ordered before muster completion, or where crew members are unaccounted for.
- For CO_2 and Foam systems, drills must reflect the requirement for full muster and accountability before release into protected spaces.
- Shore support should, where possible, assume responsibility for coordination with external experts to reduce cognitive and operational burden on the vessel. Companies should consider engaging with firefighting experts in order to establish a number to call if an incident occurs.
- Operators should think carefully about abandon ship drills. Recent incidents have shown that smoke & heat can disrupt the usual abandon ship routes and muster points.

SECTION 2 – FIRE DRILLS IN PORT

Fire drills conducted in port should regularly extend beyond ship-only exercises and involve relevant shore-side stakeholders both from the shipping company and from third parties, these may include:

- Port authorities
- Port and municipal fire services (very beneficial for familiarisation, strongly encouraged)
- Coast guard or maritime authorities
- Stevedores and terminal operators
- Other entities relevant to local operations

The drills should aim to be as realistic as possible and should reflect the increased complexity associated with cargo operations, openings in fire zones, and mixed ship-shore personnel. Obviously, vessel operators cannot unilaterally trigger multi-party port drills. Collaboration with relevant 3rd parties in regularly visited ports should be explored. Recent industry feedback affirms that realistic scenarios benefit the learning of all parties involved in such drills.

Scenario 2.1
Fire in Port – Contained by Shipboard Response

Scenario Objective

To validate shipboard response capability where a fire is contained without direct shore intervention.

Indicative Drill Sequence

- Initial response as per Scenario 1.1
- Fire confirmation and muster
- Early notification to company, port authorities and fire services (standby)
- All ship and shore personnel accounted for
- Fire team briefed and deployed where safe to do so (e.g. to help assess the status of the fire)
- Fixed firefighting systems used to contain or extinguish fire
- Boundaries established and cooled
- Fire contained and monitored
- Liaison maintained with port authorities

Scenario 2.2
Fire in Port – Contained Through Combined Ship and Shore Response

Scenario Objective

To exercise coordinated firefighting and rescue actions between ship and shore personnel.

Indicative Drill Sequence

- Initial response as per Scenario 1.1
- Early alert to company, port authorities and fire services
- Muster including shore personnel accounted for
- Fire boundaries established
- Shore firefighting assistance arrives
- Briefing for fire service incident commander to include safe use of crew in support of firefighting operations
- Exercise on containment, surrounding, or extinguishment options
- Fire contained
- Ongoing liaison with port authorities

Scenario Variation

Where not all personnel are accounted for, the drill focus should shift from firefighting to **search and rescue**, with corresponding tactical decisions.

Scenario 2.3
Fire in Port – Uncontained

Scenario Objective

To prepare for major incidents requiring escalation beyond ship and initial shore resources. TTX is key in this scenario.

Indicative Drill Sequence

- Initial response as per Scenario 1.1
- Muster including shore personnel accounted for. Assessment of crew deployment capability
- Fire boundaries established
- Shore assistance engaged
- Fire assessed as uncontainable
- Liaison with authorities and emergency management agencies
- TTX element addressing next steps, including evacuation, exclusion zones, and salvage considerations

SECTION 3 – DRILL SUBSETS AND FOCUSED EXERCISES

In addition to full-scenario drills, focused drills may be conducted to improve performance in specific areas, including:

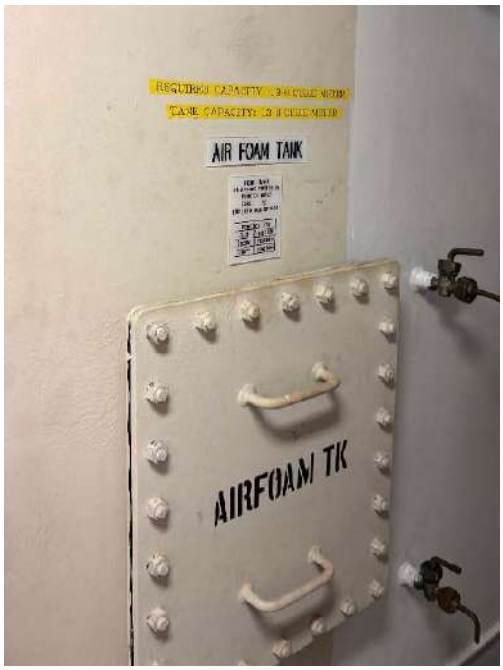
- Fast Muster Drills – improving muster times which aids fast response and deployment of FFS
- Space Close-Down Drills – familiarisation with sealing cargo and machinery spaces, particularly during port operations
- Fixed Firefighting System Deployment Drills – ensuring familiarisation to support correct use of FFS
- The use of SCBA, PPE and firefighting equipment during realistic drills builds confidence in use of SCBA and outlines limitations

Such drills are encouraged to build competence and confidence in critical response actions.

SECTION 4 – SUPPORTING INFORMATION FOR SHORE RESPONDERS

Vessel operators are encouraged to maintain and, where appropriate, share key information with shore fire services in advance or at the outset of an incident, including:

- General arrangement plans with incident location highlighted
- Fire zone layouts
- Fixed firefighting system details and status
- Cargo information and declarations
- Configuration of ramps, doors, movable structures and the location of their controls
- Personnel numbers and emergency duties
- Stability condition and water application limitations
- Gas and temperature monitoring data
- Fuel and energy storage details, including batteries



Foam storage tank – determines system endurance