

Emergency Response (ER)

SCE Description	MI-02 – ACTIVE FIRE PROTECTION FIREWATER, DELUGE & FOAM	PERFORMANCE STANDARDS	SCE Custodian	MARINE PROCESS
SAFETY CRITICAL ELEMENT	Active Fire Protection - Firewater, Deluge & Foam			
OBJECTIVE(S)	To provide fire water/ foam as control and mitigation measures against fires, minimising the potential for escalation.			
SCOPE / BOUNDARY LIMIT	<p>The following are included in this SCE:</p> <ul style="list-style-type: none"> - Fire Pumps and associated Feed Pumps, Firewater Ring Main and associated isolation valves, Foam Concentrate Ring Main and associated isolation valves, Foam and Water Deluge Valve Skids, Low Expansion Foam system (including associated Proportioner and Foam Tanks), Deluge nozzles, Foam monitors (for Main deck, and Chemical Injection Module). - Accommodation forward wall water curtain (if applicable). - Accommodation sprinkler system (if applicable). - Associated check valves specifically identified from HAZOP, where the final consequence could be MAE (if applicable). <p>Note:</p> <ul style="list-style-type: none"> - Hydrants are not considered SCE unless they are used as primary means of fire protection (e.g. for Accommodation fires). - Firefighting for helideck and helifuel dispensing is covered in ER-11 Helicopter Facility. 			
SYSTEM DESCRIPTION	[To be filled in when developing project specific EATS and OATS]			

UNCONTROLLED WHEN PRINTED

Prepared: Sagishima Yuka 2020/07/15 Approved: Tsubokawa Takehiko 2020/07/15



SCE Description	MI-02 – ACTIVE FIRE PROTECTION FIREWATER, DELUGE & FOAM	PERFORMANCE STANDARDS	SCE Custodian	MARINE PROCESS				
FUNCTIONAL SPECIFICATION			Applicable Verification Phase					
Statement	Criteria No.	Criteria	D	P	C	Cm	O	
Capacity to provide adequate firewater/foam	MI-02-01	Firewater System Fuel supply for diesel engine driven fire pump is to be sufficient for 18 hours operation.	√			√		
Capacity to provide adequate firewater/foam	MI-02-02	Firewater / Foam System The rate of supply of foam solution is to be not less than the greatest of the following: 1) 10% of the cargo deck area, where cargo deck area means the maximum breadth of the vessel multiplied by the total longitudinal extent of the cargo tank spaces – 6.5 lpm/m ² 2) Horizontal sectional area of the single tank having the largest such area – 9.78 lpm/m ² 3) Area protected by the largest monitor, such area being entirely forward of the monitor, but not less than 1,250 liters per minute -- 3 lpm/m ²	√			√		
Capacity to provide adequate deck foam	MI-02-03	Firewater / Foam System The amount of deck foam concentrate carried onboard is to be sufficient to supply the system for a period of at least 20 minutes when operating at the system’s maximum flow rate (considering that the vessel is fitted with an inert gas system).	√	√				
Capacity to provide adequate firewater/foam	MI-02-04	Firewater / Foam System Topsides equipment with significant hydrocarbons liquid inventory shall be provided with the capability to cope with pool fire by applying foam.	√					
Manual Operation	MI-02-05	Deluge System Deluge valves shall remain open until manual reset locally in the field. Manual reset (closure) of deluge valves shall not be possible during an ESD scenario.		√		√		
Deluge valve operation	MI-02-06	Deluge System Deluge valves shall be energized to open and provided with line monitoring facility.		√		√		

UNCONTROLLED WHEN PRINTED

Prepared: Sagishima Yuka 2020/07/15 Approved: Tsubokawa Takehiko 2020/07/15





SCE Description	MI-04 – HVAC AND ENCLOSURE INTEGRITY	PERFORMANCE STANDARDS	SCE Custodian	OUTFITTING
SAFETY CRITICAL ELEMENT	HVAC and Enclosure Integrity			
OBJECTIVE(S)	<ul style="list-style-type: none"> - To provide controlled environments (ventilation, heating and cooling) in primary muster area in TR and spaces containing essential service during emergency in the TR. - To dilute fugitive emissions of hydrocarbon or hydrogen gas (for battery room) in ventilated spaces. - To prevent ingress and / or accumulation of toxic, smoke or flammable gas in the Temporary Refuge for stipulated endurance period and other protected spaces and to maintain the non-hazardous area classification in these enclosed spaces. - To prevent oxygen ingress into areas where fixed firefighting system is provided ensuring effective firefighting. 			
SCOPE / BOUNDARY LIMIT	<p>The following are included in this SCE:</p> <ul style="list-style-type: none"> - Inlet/exhaust with dampers for: <ul style="list-style-type: none"> • Temporary Refuge • Space provided with fixed fire extinguishing system [e.g. Engine Room, Pump Room, E-House] • The non-hazardous enclosed spaces where electrical trip is not provided • Fire dampers penetrating fire rated bulkhead - Intakes and exhaust locations for non-hazardous enclosed spaces e.g. Accommodation, Laboratory, Workshops, Stores, E-House, Battery Room. - Packaged HVAC system for spaces containing essential service during emergency e.g. CCR, TER, UPS Room, Radio Room, EER and Mess Room (Primary Muster Area). - Air handling unit for the Accommodation and E-House / Mechanically or forced ventilation for Engine Room (to maintain positive pressure). - Mechanically/ forced ventilation for hazardous enclosed spaces, e.g. Pump Room, Battery Room and Paint Store. - Mechanically/ forced ventilation for enclosed spaces with potential for asphyxiation, e.g. Nitrogen Generator Room, CO2 bottles room. - Airlocks/ lobby. 			
SYSTEM DESCRIPTION	[To be filled in when developing project specific EATS and OATS]			

UNCONTROLLED WHEN PRINTED

Prepared: Sagishima Yuka 2020/07/15 Approved: Tsubokawa Takehiko 2020/07/15



SCE Description		MI-04 – HVAC AND ENCLOSURE INTEGRITY	PERFORMANCE STANDARDS	SCE Custodian			OUTFITTING	
FUNCTIONAL SPECIFICATION				Applicable Verification			Phase	
Statement	Criteria No.	Criteria	D	P	C	Cm	O	
Enclosed Non-Hazardous Space - Positive Pressure	MI-04-01	The HVAC systems shall maintain the pressurization (minimum 50 Pa) of the Temporary Refuge (Except Hospital and Dispensary) during normal operations to prevent ingress of smoke/gas into the TR. Hospital and Dispensary shall have a room pressure lower than adjacent rooms to prevent cross contamination but shall have a positive pressure with respect to atmosphere. On confirmed gas detection at the TR air intake, all boundary fire dampers shall be closed. <i>Performance Standard applicability for project to be checked and accordingly update it as per project specifications.</i>	√	√		√		
Enclosed Non-Hazardous Space - Min Overpressure	MI-04-02	The following non-hazardous enclosed spaces, with all access doors closed, shall be maintained with a positive pressure in relation to any adjacent more hazardous areas: - E-House - Engine Room (Note:The above enclosed spaces are selected in consideration of the size and number of access to the spaces.)	√	√		√		
Enclosed hazardous areas - Ventilation Rate	MI-04-03	The minimum HVAC air renovation of closed or semi-open areas shall comply with 12 air changes per hour. For the ventilated type battery system beside the above mentioned a minimum of 30 air changes per hour shall be considered. In case of loss of main ventilation of classified areas, the stand-by ventilation shall be automatically started up. <i>Performance Standard applicability for project to be checked and accordingly update it as per project specifications.</i>		√		√		

UNCONTROLLED WHEN PRINTED

Prepared: Sagishima Yuka 2020/07/15 Approved: Tsubokawa Takehiko 2020/07/15

