

Mitigation Measures (MI)

SCE Description	ER-07 - LIFEBOATS AND LIFEBOAT DAVITS	PERFORMANCE STANDARDS	SCE Custodian	OUTFITTING
SAFETY CRITICAL ELEMENT	Lifeboats and Lifeboat Davits			
OBJECTIVE(S)	To provide the primary means of evacuation for all POB from the FPSO.			
SCOPE / BOUNDARY LIMIT	The following are included in this SCE: <ul style="list-style-type: none"> - Lifeboats (TEMPSCs) and associated davit launching mechanisms provided on port and starboard sides of the TR. - Lifeboat embarkation area. 			
SYSTEM DESCRIPTION	[To be filled in when developing project specific EATS and OATS]			
RELEVANT MAH	MAH-01a(S): Hydrocarbons risers / Loss of containment outboard of FPSO MAH-01a(T): Hydrocarbons risers / Loss of containment outboard of FPSO MAH-01b(S): Hydrocarbons risers / Loss of containment in riser balcony MAH-01b(T): Hydrocarbons risers / Loss of containment in turret MAH-02a(T): Hydrocarbon production / Loss of containment in turret MAH-02b: Hydrocarbon production / Loss of containment in production module topside MAH-03a: Fuel gas supplies / Loss of containment in open areas outside production modules MAH-03b: Fuel gas supplies / Loss of containment in engine room MAH-03c: Fuel gas supplies / Loss of containment in turbine enclosure MAH-04a: Cargo storage & offloading / Loss of containment over cargo storage area MAH-04b: Cargo storage & offloading / Loss of containment in pump room MAH-04c: Cargo storage & offloading / Loss of containment at cargo metering package MAH-04d: Cargo storage & offloading / Loss of containment along living quarters MAH-04e: Cargo storage & offloading / Loss of containment at offloading station MAH-04f: Cargo storage & offloading / Loss of containment from offloading hose MAH-04g: Cargo storage & offloading / Tank rupture or explosion MAH-06c: Non-process flammable hazards / Fire in living quarters MAH-06d: Non-process flammable hazards / Engine room / Machinery space fire MAH-06e: Non-process flammable hazards / Electrical / Electronic equipment room fire MAH-09a: Structures under loading / Hull structural failure MAH-09b: Structures under loading / Flare tower collapse			

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



SCE Description	ER-07 - LIFEBOATS AND LIFEBOAT DAVITS	PERFORMANCE STANDARDS	SCE Custodian	OUTFITTING
INTERDEPENDENCY				
SCE		Relationship		
<ul style="list-style-type: none"> - ER-01 (Emergency Communication) - ER-02 (Escape and Evacuation Routes) - ER-04 (Emergency Escape Lighting) - ER-05 (Temporary Refuge) - ER-09 (Life Saving Equipment) - MI-02 (AFP – Firewater, Deluge and Foam) 		<ul style="list-style-type: none"> - Provides notification to abandon and also rescue communications onboard the lifeboats - Evacuation routes provided from TR to lifeboats - Emergency escape lighting provided at lifeboat embarkation area - TR protects personnel prior to lifeboat embarkation - Provides life saving equipment in lifeboats and lifeboats embarkation areas - Firewater provided to protect the lifeboat and embarkation area 		

SCE Description	ER-07 - LIFEBOATS AND LIFEBOAT DAVITS	PERFORMANCE STANDARDS	SCE Custodian	OUTFITTING			
FUNCTIONAL SPECIFICATION			Applicable Verification Phase				
Statement	Criteria No.	Criteria	D	P	C	Cm	O
Provide a safe means for evacuation of the facility	ER-07-01	Lifeboats (TEMPSC) shall be provided port and starboard of the accommodation with direct access from the TR and be type approved and tested according to SOLAS/ LSA Code requirements.	√	√			
Provide a safe means for evacuation of the facility	ER-07-02	Combined lifeboat capacities at each side of the FPSO shall be adequate to accommodate maximum FPSO POB.		√			
Structural	ER-07-03	The lifeboat, with its full complement of persons and equipment, shall be of sufficient strength to withstand a lateral impact against the vessel's side at an impact velocity of at least 3.5 m/s and a drop into the water from a height of at least 3 m.		√			
Self-propulsion - engine type	ER-07-04	The lifeboat shall be powered by a compression-ignition engine. The engine shall be provided with either a manual starting system, or a power starting system with two independent rechargeable energy sources.		√		√	

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FUNCTIONAL SPECIFICATION			Applicable Verification			Phase	
Statement	Criteria No.	Criteria	D	P	C	Cm	O
Self-Propulsion - engine speed	ER-07-05	The lifeboat, when loaded with its full complement of persons and equipment and with all engine-powered auxiliary equipment in operation, shall be capable of reaching 6 knots in calm water.		√			
Self-propulsion - engine fuel	ER-07-06	The lifeboat shall contain sufficient fuel to run the fully loaded lifeboat at 6 knots for a minimum of 24 hours		√			
Ability to move forwards and backwards (reverse)	ER-07-07	The lifeboat shall have the ability to move forwards and backwards (reverse).		√			
Launch / recovery - approved launching devices	ER-07-08	The lifeboat shall be fitted with a SOLAS/ LSA Code approved launching appliance (i.e. davit).		√			
Launch / recovery - layout of launching device	ER-07-09	Lifeboat launching stations shall be in such positions as to ensure safe launching. There should not be obstructions (e.g. mooring lines, offloading hoses) or firewater pump discharge which will be in the path of the lifeboats after launching.	√				
Launch / recovery - launching conditions	ER-07-10	The lifeboat, with all equipment and with or without crew, shall be capable of being safely launched under all conditions of trim up to 10° and list of up to 20° either way	√				
Communications	ER-07-11	Appropriate external/ internal emergency communication systems is required for lifeboat evacuation and as a minimum shall be compliant with LSA requirements. Refer to ER-01 Emergency Communications.					
Breathable atmosphere for personnel	ER-07-12	Lifeboat shall be provided with a self-contained air support system with a capacity to provide breathable air for not less than 10 minutes.		√			
Provision of devices - lowering speed	ER-07-13	Lifeboat davit shall be capable of lowering lifeboat to the water at speeds not less than: $S=0.4+0.02H$ with S = lowering speed (m/s) & H = height in metres from davit head to the waterline (minimum draft).				√	





SCE Description	ER-05 - TEMPORARY REFUGE	PERFORMANCE STANDARDS	SCE Custodian	OUTFITTING
SAFETY CRITICAL ELEMENT	Temporary Refuge			
OBJECTIVE(S)	To provide a place where personnel can: <ul style="list-style-type: none"> - Muster in the event of a major accident event, where personnel will be adequately protected. - Have access to the communications, monitoring and control equipment necessary to ensure their personal safety, and from where, if necessary, safe and complete evacuation can be affected. - Maintain communications, monitoring and control equipment/facilities during a MAE. 			
SCOPE / BOUNDARY LIMIT	The following are included in this SCE: <ul style="list-style-type: none"> - Temporary Refuge refers to a place provided where personnel can take refuge for a pre-determined period whilst investigations, emergency response and evacuation pre-planning are undertaken. <p><i>Note: The Accommodation Block is designated as the Temporary Refuge and the Mess Room as the Primary Muster Area.</i></p> Refer to MI-04 HVAC and Enclosure Integrity for TR integrity			
SYSTEM DESCRIPTION	[To be filled in when developing project specific EATS and OATS]			

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SCE Description	ER-05 - TEMPORARY REFUGE	PERFORMANCE STANDARDS	SCE Custodian	OUTFITTING
INTERDEPENDENCY				
SCE		Relationship		
<ul style="list-style-type: none"> - DC-03 (Fire & Gas Detection) - DC-04 (Emergency Shutdown) - DC-05 (Blowdown) - MI-01 (Passive Fire Protection) - MI-02 (AFP – Firewater, Deluge & Foam) - MI-04 (HVAC and Enclosure Integrity) - ER-01 (Emergency Communications) - ER-02 (Escape & Evacuation Routes) - ER-03 (Emergency Power) - ER-04 (Emergency Escape Lighting) - ER-09 (Life Saving Equipment) - PR-01 (Hull Structural Integrity) - PR-11 (Ballast System) 		<ul style="list-style-type: none"> - Fire & Gas Detection panel is located within the TR - ESD facilities are located within the TR - Emergency Blowdown facilities are located within the TR - PFP protects TR bulkheads & deckheads from fires - AFP protects against fires that may affect TR integrity - Prevents gas and/or smoke ingress - Emergency communications system is located within the TR - Escape and evacuation routes are provided to and from the TR - Emergency power is supplied to emergency systems in the TR - Emergency escape lighting is provided within the TR - Live Saving Equipment are provided within the TR - Maintain positive stability - Ballast system is required to maintain the stability of the FPSO and in turn, the stability of TR 		

SCE Description	ER-05 - TEMPORARY REFUGE	PERFORMANCE STANDARDS	SCE Custodian	OUTFITTING			
FUNCTIONAL SPECIFICATION			Applicable Verification Phase				
Statement	Criteria No.	Criteria	D	P	C	Cm	O





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SCE Description	ER-05 - TEMPORARY REFUGE	PERFORMANCE STANDARDS	SCE Custodian			OUTFITTING	
FUNCTIONAL SPECIFICATION			Applicable Verification			Phase	
Statement	Criteria No.	Criteria	D	P	C	Cm	O
Provide shelter for Maximum persons on board (POB).	ER-05-01	The TR shall provide a protected environment for the maximum project-defined POB during emergency for a minimum endurance time of 60 minutes, or as per project- defined endurance time.	√				
Provide sufficient free floor area for maximum POB.	ER-05-02	Sufficient free floor area shall be provided to accommodate maximum POB in the Primary Muster Area in TR. Muster area minimum capacity shall be 0.35 m2 per person in accordance with SOLAS requirement.	√				
Provide ability to monitor and control FPSO systems from the TR	ER-05-03	The TR (typically CCR) shall have the facility to monitor and control safety systems (required for the relevant emergency conditions) during a major accident event. <ul style="list-style-type: none"> - initiate all levels of shutdown, - activate active fire protection systems, - initiate well isolation. <p><i>Note: Active fire protection activation from CCR does not apply for CO2 fixed extinguishing system</i></p>	√			√	
Provide ability to monitor and control FPSO systems from the TR	ER-05-04	The CCR shall continue to function uninterrupted during loss of main and emergency power and at all shutdown levels up to (but excluding) "abandon vessel" shutdown. Refer also to ER-03 – Emergency Power					
Provide non-toxic furnishing within the TR	ER-05-05	Furnishings (ceiling, flooring, surface finishes and joiner works) provided within the accommodation should not release toxic fumes if affected by heat due to fire.		√			
Provide ability to communicate internally within the facility and with external support	ER-05-06	TR shall be provided with redundant, diverse internal and external emergency communications systems. Refer to ER-01 – Emergency Communications					
Escape routes within TR	ER-05-07	Provide sufficient escape routes within TR. Refer to ER-02 for escape routes within TR.					

