SCE Description	DC-01 - PRESSURE RELIEF	PERFORMANCE STANDARDS	SCE Custodian	TOPSIDES PROCESS

SAFETY CRITICAL ELEMENT	Pressure Relief
OBJECTIVE(S)	To prevent overpressure resulting to a loss of containment that leads to a MAE from equipment and piping in upset conditions (e.g. blocked discharge, overfilling case) by controlled disposal through pressure relieving devices.
SCOPE / BOUNDARY LIMIT	The following are included in this SCE: - Safety critical pressure relieving devices (rupture discs, relief valves), i.e. hydrocarbon including fuel gas, and other highly flammable substances identified (e.g. mono-ethylene glycol, helifuel, methanol / ethanol) leading to MAE ; excluding relieving devices associated with air, water, nitrogen, cooling/heating medium, non-flammable chemical injection and lubrication oil but including pressure relieving devices specifically identified from HAZOP, where the final consequence could be MAE. - Associated double check valves considered when sizing the identified pressure relieving devices (if applicable). - Locking system for manual isolation valves on the inlet or outlet (where provided) of pressure relieving devices. Note: P/V valves and P/V Breakers are covered under PR-10 Gas Blanketing.
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-05a: Toxic gas / Loss of containment topside MAH-06a: Non-process flammable hazards / Loss of containment of flammable chemical MAH-06b : Non-process flammable hazards / Loss of containment of helifuel

INTERDEPENDENCY

SCE	Relationship
- PR-08 (Hydrocarbon Containment – Process/Utilities) - DC-02 (Flare System)	- Process relief protects topside containment system from overpressure - Pressure is relieved to the flare system.

SCE Description	DC-01 - PRESSURE RELIEF	PERFORMANCE STANDARDS	SCE Custodian	TOPSIDES PROCESS

FUNCTIONAL SPECIFICATION			Applicable Verification Phase				
Statement	Criteria No.	Criteria	D	P	C	Cm	O
Protect against over-pressurisation	DC-01-01	Pressure relief system shall be provided as a protection to prevent overpressure where pressure could rise above the design pressure of the system.	√	√		√	
Protect against over-pressurization /Availability - manual valves - LO/LC	DC-01-02	Where multiple pressure relief devices are fitted on a system which includes additional device as spare, the manual isolation valves installed in connection with pressure relieving devices (PSV, rupture disc or depressurization valve) shall be locked open/ closed as appropriate. Manual isolation valves installed between the protected system and a non-spared relieving device(s) shall be locked open.	√		√		
Relief operation and disposal	DC-01-03	Pressure relief valves in hydrocarbon gas service are to discharge to one or more closed relief headers for atmospheric discharge at flare. Refer to DC-02 Flare System.					
Relief operation and disposal - free draining & PSV sizing	DC-01-04	All pressure relieving device inlet lines shall be free draining to source, have no pockets, and pipe size shall not be less than the pressure relieving device inlet size. Relief valve discharge lines connected to a closed system shall enter the top of the header, as far as practicable.	√		√		

AVAILABILITY / RELIABILITY SPECIFICATION			Applicable Verification Phase				
Statement	Criteria No.	Criteria	D	P	C	Cm	O
No availability / reliability criteria identified.							

SURVIVABILITY SPECIFICATION			Applicable Verification Phase				
Statement	Criteria No.	Criteria	D	P	C	Cm	O
No survivability criteria identified.							

SCE Description	DC-04 - EMERGENCY SHUTDOWN SYSTEM	PERFORMANCE STANDARDS	SCE Custodian	I&C

SAFETY CRITICAL ELEMENT	Emergency Shutdown System
OBJECTIVE(S)	To prevent process conditions exceeding design limits resulting in loss of containment that leads to a MAE , and to limit the potential for escalation of hazardous event by initiating executive actions for shutdown, isolation and blowdown.
SCOPE / BOUNDARY LIMIT	The following are included in this SCE: - SIS (SSDS) panels, ESD/PSD RI/O cabinets, ESD pushbuttons, pushbutton console in CCR, ESD valves (see note), SIL classified SIFs where final consequence is a MAE (shutdown valves with actuators and transmitters and associated signal cabling, breakers of electrical equipment), shutdown valves to avoid HC migration to non-hazardous spaces specifically identified from HAZOP. - Cargo and helifuel pumps shutdown *Note:* *Only hydrocarbon riser isolation valves are ESDVs by MODEC definition. Compressor isolation valves are called ESDVs but they are actually SDVs with 2 solenoids (one from UCP and one from ESD).* *PSD pushbuttons shall be included for any manned operation (i.e. deck boiler operation, helifuel dispensing operation) that are SCE dependent.*
SYSTEM DESCRIPTION	[To be filled in when developing project specific EATS and OATS]

SCE Description	DC-04 - EMERGENCY SHUTDOWN SYSTEM	PERFORMANCE STANDARDS	SCE Custodian	I&C

SCE Description	DC-04 - EMERGENCY SHUTDOWN SYSTEM	PERFORMANCE STANDARDS	SCE Custodian	I&C

FUNCTIONAL SPECIFICATION			Applicable Verification Phase				
Statement	Criteria No.	Criteria	D	P	C	Cm	O
ESD system	DC-04-01	The ESD system shall, upon confirmed detection from the F&G System or manual activation via ESD pushbutton, undertake the appropriate automatic executive actions to prevent, control or mitigate hazards in accordance with the Safety Shutdown Block Diagram.	√			√	
Fail safe	DC-04-02	Emergency shutdown system (including ESD/PSD RI/O cabinets) shall be fail-safe or line monitored and provided with self-diagnostics. Shutdown valves shall fail closed on loss of signal/power.		√		√	
ESD valve position indication	DC-04-03	Emergency Shutdown Valves open/close position indicator shall be provided in the CCR and locally.		√		√	
Loading of SIS controllers	DC-04-04	SSDS controllers shall have maximum load of 60% during the final engineering/design phases of the project. *Performance Standard applicability for project to be checked and accordingly update it as per project specifications.*		√		√	
ESD valve closure time	DC-04-15	ESD valves shall meet the following valve closure times: Less than 8": 15 seconds 8" and more: 2 sec / inch or maximum 45 seconds *Performance Standard applicability for project to be checked and accordingly update it as per project specifications.*		√		√	