# Base Load Power Hub (BLPH)

## Safety Critical Elements (SCE) and Performance Standard

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# 1. INTRODUCTION

## 1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

### 1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

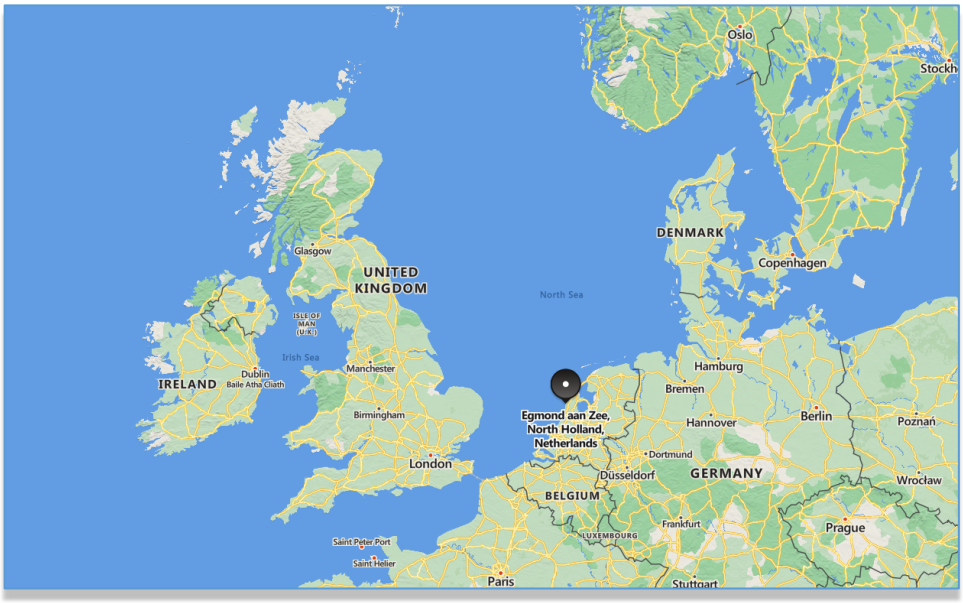



*Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map*

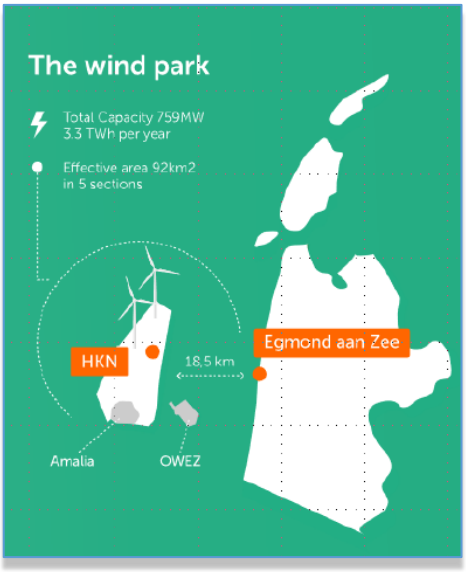



*Figure 2 - Wind Park Details*

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

### 1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

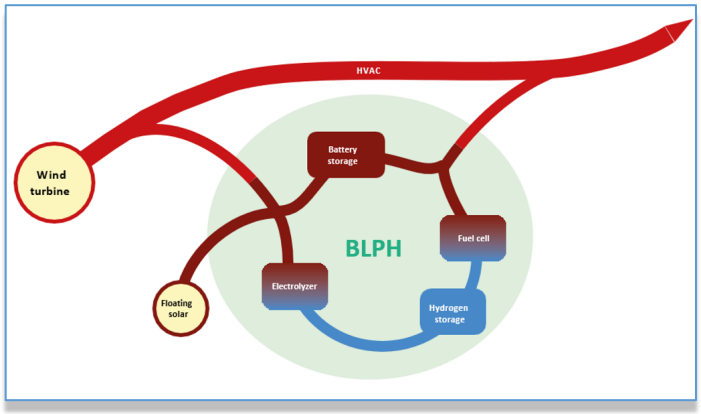



*Figure 3 – BLPH Concept*

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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# 2. DOCUMENT SCOPE

This document has the purpose of identify the Safety Critical Elements (SCE) and relevant Performance Standards (PS) in the scope of BLPH project.

SCE are defined as the elements which can be subjected to failure and substantially cause, contribute, prevent or help recover from a major accident hazard or event on the platform, and the purpose of Performance Standard is to determine maintenance testing activities necessary to maintain SCE in suitable working conditions.

## 2.1 MAIN REFERENCES

| Ref. | Description |
|---|---|
| 1 | BLPH_MODEL_15-01-24 (3D model of platform) |
| 2 | 123A90-DDL-PP-DL-70070 - Base Load Power Hub (BLPH) - Plot Plan - Lower & Upper deck |
| 3 | 123A90-DDL-PP-DL-70071- Base Load Power Hub (BLPH) - Plot Plan - Below Lower deck |
| 4 | 123A90-DDL-PR-RE-80040 – Process Design Philosophy |
| 5 | 123A90-DDL-PR-DG-80003//123A90-DDL-PR-DG-80005- PFD |
| 6 | 123A90-DDL-PR-PID-80010//123A90-DDL-PR-PID-80029- PID |
| 7 | 123A90-DDL-IN-CE-40000 - Process Safety Cause & Effect Matrix |
| 8 | 123A90-DDL-SAF-RE-30046 – HSE Design Philosophy, rev 01, 16/10/2023 |
| 9 | 123A90-DDL-PR-BL-80002 – H&MB, rev 01, 09/11/2023 |
| 10 | K559-2254-PM-PLN-003 – BDEP – Basic Desing Engineering Package revision 1 |
| 11 | 123A90-DDL-SAF-RE-30009 – HAZID Report |
| 12 | 123A90-DDL-SAF-RE-30006 – HAZOP Report |
| 13 | 144671-VOOW-TF-ENG-REP-1056 Ship impact for BLPH |
| 14 | 123A90-DDL-SAF-RE-30019 - Quantified Risk Assessment (QRA) Report |
| 15 | 123A90-DDL-SAF-RE-30020 - Fire and Explosion Risk Analysis (FERA) report |
| 16 | 123A90-DDL-SAF-RE-30015 - Evacuation, Escape and Rescue Assessment (EERA) Report |

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| Ref. | Description |
|---|---|
| 17 | 123A90-DDL-SAF-RE-30041 - Noise Assessment Study Report |
| 18 | 123A90-DDL-SAF-RE-30022 – Hazardous Area Classification Area Lower and upper Deck |
| 19 | 123A90-DDL-SAF-DL-30024– Hazardous Area Classification Area Elevation Looking North & East |
| 20 | 123A90-DDL-SAF-DL-30025 – Escape Routes, Firefighting; Life Saving Equipment and Safety Equipment Layout Drawings |
| 21 | K559-2254-SE-REP-018 - BLPH SCE Identification (note: study for FEED phase) |
| 22 | 123A90-DDL-SAF-DL-30028 – F&G detection Layout |
| 23 | 123A90-DDL-SAF-RE-30001 - Fire protection philosophy |
| 24 | 123A90-DDL-TL-SP-45007 - Telecom System Specification & Philosophy |
| 25 | 123A90-DDL-EL-RE-20154 - Lightning Protection System Calculation Report |

*Table 1 - Reference Documents*

## 2.2 DEFINITIONS AND ABBREVIATIONS

### 2.2.1 Definitions

| | |
|---|---|
| COMPANY or Client (CPY): | Crosswind |
| EPC CONTRACTOR (CTR): | ROSETTI MARINO S.p.A. |
| PROJECT: | HOLLANDSE KUST NOORD WIND PARK Project |
| CONSEQUENCES | The outcome of an event. For the purpose of this project, the outcome is identified in terms of harm to exposed persons and assets. |
| EVENT | Occurrence or change of a particular set of circumstances. |
| HAZARD | Situation having the potential to cause harm, including ill health and injury, damage to property, production losses or increased liabilities |
| FAILURE | Damage of equipment which can lead to release of substances from the process. |
| FIRE | The outcome of combustion of flammable substance released in the atmosphere as a consequence of a LOC, which can produce effects to exposed persons and to process equipment and structure due to thermal radiation. |

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|---|---|
| MAJOR ACCIDENT | Major Accident can be defined as:<br>- a fire, explosion or the release of a dangerous substance involving death or serious personal injury to persons on the installation or engaged in an activity on or in connection with it;<br>- any event involving major damage to the structure of the installation or plant affixed thereto or any loss in the stability of the installation or major environmental impact |
| MAJOR ACCIDENT HAZARD | Source of danger that has the potential to cause a Major Accident |
| LOSS OF CONTAINMENT | The event associated with the release of a hazardous substance from equipment leading to a potential accident scenario |
| RANDOM LOSS | A loss of containment from piping and equipment due to random causes which leads to a release of a hazardous substance in the environment. |
| TOP EVENT | The identification and quantification of a Major Accident |

*Table 2 - Definitions*

### 2.2.2 Abbreviations

| | |
|---|---|
| BDV | Blow Down Valve |
| BDES | Basic Design and Engineering Package |
| BESS | Battery Energy Storage System |
| BLPH | Base Load Power Hub |
| DEPs | Design and Engineering Practices |
| EERA | Escape, Evacuation and Rescue Assessment |
| ESD | Emergency Shut Down system |
| F&G | Fire and Gas |
| FERA | Fire and Explosion Risk Assessment |
| HAZID | Hazard Identification Study |
| HAZOP | Hazard and Operability Study |
| H&MB | Heat and Material Balance |
| HKN | Hollandse Kust Noord |
| HSE | Health, Safety and Environment |
| LOC | Loss Of Containment |
| MAH | Major Accident Hazard |
| PID | Piping and Instrumentation Diagram |
| PFD | Process Flow Diagram |

| | |
|---|---|
| POB | Person On Board |
| PSV | Pressure Safety Valve |
| QRA | Quantitative Risk Assessment |
| SCE | Safety Critical Element |
| SDV | Emergency Shut Down Valve |
| UPS | Uninterruptable Power System |

*Table 3 - Abbreviations*

# 3. SAFETY CRITICAL ELEMENTS

## 3.1 SCE DEFINITION AND CHARACTERIZATION

The Safety Critical Elements (SCEs) are those items or structures or systems (or subsystems) whose main objective is to prevent a major accident or mitigate the consequences related to a major accident, or whose failure can lead to a major accident or contribute to its occurrence/evolution.

Safety Critical Element shall meet the performance standards as listed below and shall meet the technical specifications, standards and Project applicable DEPs and the Basic Design and Engineering Package (BDEP).

SCEs that have been identified for BLPH Hub installation were based on the eight hardware categories which are below listed and reported in Figure 4.

- Structural integrity
- Process Containment
- Ignition Control
- Detection Systems
- Protection Systems
- Shutdown system
- Emergency Response
- Life Saving

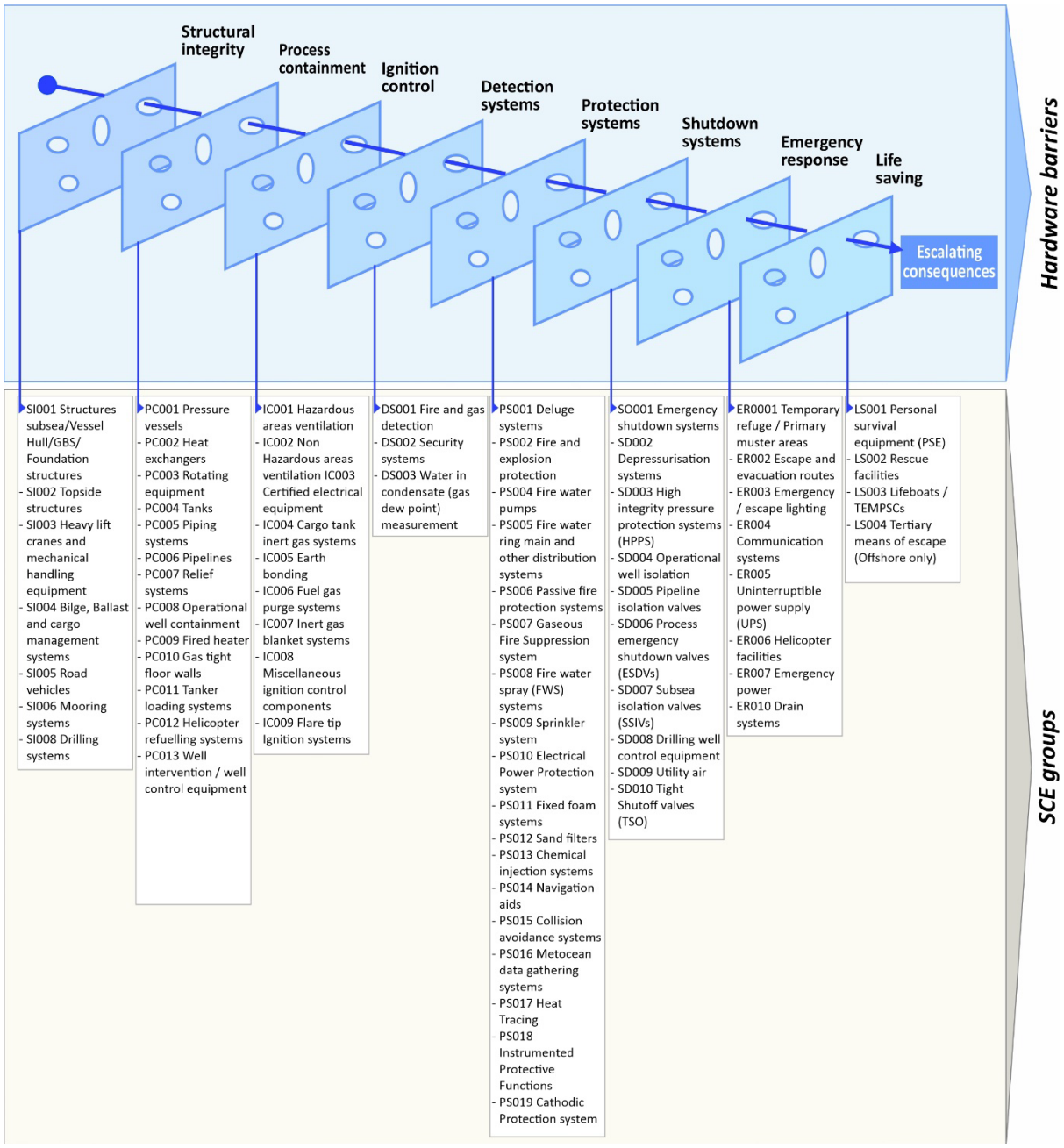



*Figure 4 –Hardware barrier and SCE groups*

## 3.2 MAH AND SCE IDENTIFICATION

The process of MAH identification for the installation was already undergone during the previous phase of the project [21], and can be summarized in the following two Major Hazards:

- Hydrogen Release:

  The identified MAH is associated to the potential risk of loss of containment (LOC) of Hydrogen gas which might evolve in terms of fire scenario or explosion with impact to personnel safety and for platform structure. The risks associated to Hydrogen release has been identified with reference to the results of the HAZID [11], HAZOP [12], and QRA [14] studies. The result of a hydrogen release might lead to fire and explosion.

- Marine Vessel Collision:

  The identified MAH is associated to the potential risk of boat collision to the platform which might evolve in terms of structure loss of stability. The risks associated to critical structure has been identified with reference to the results of the HAZID [11] and Ship impact [13] studies.

- Thermal Runaway within BESS:

  The identified MAH is associated to the potential risk of thermal runaway within BESS during maintenance activities which might evolve in terms internal explosion with impact to personnel safety and for platform structure. The risks associated to critical structure has been identified with reference to the results of the HAZID [11] study.

The SCE groups identified through the analysis of the MAHs are summarized in the following table 4. For each SCE group, the table reports the relation to the identified MAHs.

| SCE Category (Hardware Barrier) | | SCE Groups | | MAH_01 Hydrogen Release with Fire and Explosion | MAH_02 Marine Vessel Collision | MAH_03 TR within BESS |
|---|---|---|---|---|---|---|
| SI | Structural integrity | SI001 | Subsea structures | | X | |
| | | SI002 | Topside structures | | X | |
| PC | Process Containment | PC001 | Pressure vessel | X | | |
| | | PC005 | Piping system | X | | |
| | | PC007 | Relief System (PSV) | X | | |
| IC | Ignition Control | IC001 | Hazardous area ventilation | X | | X |

| SCE Category (Hardware Barrier) | | SCE Groups | | MAH_01 Hydrogen Release with Fire and Explosion | MAH_02 Marine Vessel Collision | MAH_03 TR within BESS |
|---|---|---|---|---|---|---|
| | | IC002 | Non-Hazardous area ventilation | X | | X |
| | | IC003 | Certified (ex-rated) electrical equipment | X | | X |
| | | IC005 | Electrical earthing continuity & bonding | X | | X |
| | | IC007 | Inert gas blanket system | X | | |
| DS | Detection Systems | DS001 | Fire and gas detection | X | | X |
| PS | Protection Systems | PS002 | Fire and explosion protection | X | | X |
| | | PS015 | Collision Avoidance System | | X | |
| SD | Shutdown system | SD001 | Emergency Shutdown System (ESD) | X | | X |
| | | SD002 | Blowdown Valves (BDV) | X | | |
| | | SD006 | Emergency Shutdown Valves (SDV) | X | | X |
| | | SD009 | Utility Air | X | | |
| ER | Emergency Response | ER001 | Muster Area | X | X | X |
| | | ER002 | Escape Routes | X | X | X |
| | | ER003 | Emergency / Escape Lighting | X | X | X |
| | | ER004 | Communication System | X | X | X |
| | | ER005 | Uninterruptible Power System (UPS) | X | | X |
| LS | Life Saving | LS001 | Personal Survival Equipment | X | X | X |
| | | LS002 | Alternate means of escape (liferaft) | X | X | X |

*Table 4 – SCE Group and association to MAH*

## 3.3 SCE REGISTER

The above list of SCE group has been developed also at TAG level, analysing the relevant documentation in order to provide the list of the critical elements in a proper SCE register.

The analysis has not taken into account those elements which are not continuously present on the platform but are brought on board from crew when entering the platform, such as:

- Portable eye wash station
- Portable phone

The reason is that those elements are not associated only to the subject platform and for those elements is already present a dedicated control and maintenance plan.

The SCE register has been provided as a worksheet, organized by column, in which are reported the following information:

- SCE TAG Unique identification Tag of the SCE.
- Description Brief description of functionality of the SCE.
- SCE Group Identification of the SCE group, on basis of the categories provided in Table 4 .
- CODE SCE unique code based on TAG and SCE category.
- Notes Explanation notes for the completeness of information.

The analysis led to the identification of an overall number of 620 SCEs, categorized in 23 SCE groups.

The SCE register is reported in ATTACHMENT 1.

# 4. PERFORMANCE STANDARDS

The purpose of Performance Standard activity is to determine maintenance testing activities necessary to maintain SCE in suitable working conditions, and to elaborate the Performance Standard (PS) cards for each typology of element of the platform which have been classified as SCE.

One PS card has been elaborated for each SCE category as defined in section 3.2.

PS cards have been structured in header part and detailed part.

The header part contains following information:

- SCE ID / Description: Description and code of SCE category as per section 3.2
- SCE boundaries: equipment / components to be included
- SCE Goal: Information about SCE function / purpose
- Interactions & Dependencies: influence on / by others main equipment / systems

The detailed part contains following information, divided for all the elements which comprise the SCE category:

- functionality criteria: Specific function of the element
- performance measure: required performance of the element
- assurance method: specific parameter to check (if any)
- operating instructions (including testing frequency)
- reliability criteria: how often the SCE should be operational and available for use.
- Survivability criteria: conditions under which the SCE must remain operational, including during adverse events

The PS cards (one for each SCE Group) are reported in ATTACHMENT 2.

# ATTACHMENT 1 – SCE REGISTER

| SCE TAG | DESCRIPTION | SCE GROUP | CODE | NOTE |
|---|---|---|---|---|
| SI001 SUBSEA STRUCTURE | | | | |
| BLPH-STRUCTURES | BLPH SUBSEA STRUCTURES | SI001 | SI001-BLPH-STRUCTURES | |
| SI002 TOPSIDE STRUCTURES | | | | |
| BLPH-TOPSIDE | BLPH TOPSIDE AND PRIMARY STRUCTURE | SI002 | SI002-BLPH-TOPSIDE | |
| PC001 VESSELS | | | | |
| V-25001A | HYDROGEN HORIZONTAL STORAGE VESSEL V-25001A | PC001 | PC001-V-25001A | |
| V-25001B | HYDROGEN HORIZONTAL STORAGE VESSEL V-25001B | PC001 | PC001-V-25001B | |
| V-25001C | HYDROGEN HORIZONTAL STORAGE VESSEL V-25001C | PC001 | PC001-V-25001C | |
| V-25001D | HYDROGEN HORIZONTAL STORAGE VESSEL V-25001D | PC001 | PC001-V-25001D | |
| V-25001E | HYDROGEN HORIZONTAL STORAGE VESSEL V-25001E | PC001 | PC001-V-25001E | |
| V-25001F | HYDROGEN HORIZONTAL STORAGE VESSEL V-25001F | PC001 | PC001-V-25001F | |
| V-43001 | HYDROGEN VENT KO DRUM V-43001 | PC001 | PC001-V-43001 | |
| Q-43004 | HYDROGEN VENT Q-43004 | PC001 | PC001-Q-43004 | |
| PC005 PIPING SYSTEM | | | | |
| 1"-HY-007-03HSS-N | FROM ELECTROLYZER PACKAGE (A-20000) TO HYDROGEN STORAGE VESSELS HEADER (INLET) | PC005 | PC005-1"-HY-007-03HSS-N | |
| 2"-VL-003-01HSS-N | A20000 VENT LINE | PC005 | PC005-2"-VL-003-01HSS-N | |
| 1"-HY-007-03HSS-N | H2 COMMON INLET LINE TO STORAGE VESSELS | PC005 | PC005-1"-HY-007-03HSS-N | |
| 1"-HY-143-03HSS-N | FROM 1"-HY-007-03HSS-N TO 25-BDV-003 (VENT LINE) | PC005 | PC005-1"-HY-143-03HSS-N | |
| 1"-VL-014-01HSS-N | H2 DISTRIBUTION LINE TO STORAGE VESSELS VENT LINE | PC005 | PC005-1"-VL-014-01HSS-N | |
| 1"-HY-015-03HSS-N | H2 INLET LINE TO HYDROGEN STORAGE VESSEL V-25001A | PC005 | PC005-1"-HY-015-03HSS-N | |
| 1"-HY-016-03HSS-N | H2 INLET LINE TO HYDROGEN STORAGE VESSEL V-25001B | PC005 | PC005-1"-HY-016-03HSS-N | |
| 1"-HY-017-03HSS-N | H2 INLET LINE TO HYDROGEN STORAGE VESSEL V-25001C | PC005 | PC005-1"-HY-017-03HSS-N | |

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| SCE TAG | DESCRIPTION | SCE GROUP | CODE | NOTE |
|---|---|---|---|---|
| 1"-HY-018-03HSS-N | H2 INLET LINE TO HYDROGEN STORAGE VESSEL V-25001D | PC005 | PC005-1"-HY-018-03HSS-N | |
| 1"-HY-019-03HSS-N | H2 INLET LINE TO HYDROGEN STORAGE VESSEL V-25001E | PC005 | PC005-1"-HY-019-03HSS-N | |
| 1"-HY-020-03HSS-N | H2 INLET LINE TO HYDROGEN STORAGE VESSEL V-25001F | PC005 | PC005-1"-HY-020-03HSS-N | |
| 1"-HY-024-03HSS-N | FROM HYDROGEN STORAGE VESSEL V-25001A TO 25-PSV-001A (VENT LINE) | PC005 | PC005-1"-HY-024-03HSS-N | |
| 3"-HY-142-03HSS-N | FROM HYDROGEN STORAGE VESSEL V-25001A TO 25-BDV-005/25-PV-005 (VENT LINE) | PC005 | PC005-3"-HY-142-03HSS-N | |
| 4"-VL-145-01HSS-N | HYDROGEN STORAGE VESSEL V-25001A VENT LINE | PC005 | PC005-4"-VL-145-01HSS-N | |
| 4"-VL-025-01HSS-N | HYDROGEN STORAGE VESSEL V-25001A VENT LINE | PC005 | PC005-4"-VL-025-01HSS-N | |
| 1"-HY-026-03HSS-N | FROM HYDROGEN STORAGE VESSEL V-25001A TO HYDROGEN STORAGE VESSELS HEADER (OUTLET) | PC005 | PC005-1"-HY-026-03HSS-N | |
| 1"-HY-153-03HSS-N | N2 CONNECTING LINE TO HYDROGEN STORAGE VESSEL V-25001A | PC005 | PC005-1"-HY-153-03HSS-N | |
| 1"-HY-166-03HSS-N | FROM HYDROGEN STORAGE VESSEL V-25001B TO 25-PSV-001B (VENT LINE) | PC005 | PC005-1"-HY-166-03HSS-N | |
| 3"-HY-167-03HSS-N | FROM HYDROGEN STORAGE VESSEL V-25001B TO 25-BDV-007/25-PV-007 (VENT LINE) | PC005 | PC005-3"-HY-167-03HSS-N | |
| 4"-VL-168-01HSS-N | HYDROGEN STORAGE VESSEL V-25001B VENT LINE | PC005 | PC005-4"-VL-168-01HSS-N | |
| 4"-VL-111-01HSS-N | HYDROGEN STORAGE VESSEL V-25001B VENT LINE | PC005 | PC005-4"-VL-111-01HSS-N | |
| 1"-HY-132-03HSS-N | FROM HYDROGEN STORAGE VESSEL V-25001B TO HYDROGEN STORAGE VESSELS HEADER (OUTLET) | PC005 | PC005-1"-HY-132-03HSS-N | |
| 1"-HY-186-03HSS-N | N2 CONNECTING LINE TO HYDROGEN STORAGE VESSEL V-25001B | PC005 | PC005-1"-HY-186-03HSS-N | |
| 1"-HY-170-03HSS-N | FROM HYDROGEN STORAGE VESSEL V-25001C TO 25-PSV-001C (VENT LINE) | PC005 | PC005-1"-HY-170-03HSS-N | |
| 3"-HY-171-03HSS-N | FROM HYDROGEN STORAGE VESSEL V-25001C TO 25-BDV-010/25-PV-010 (VENT LINE) | PC005 | PC005-3"-HY-171-03HSS-N | |
| 4"-VL-172-01HSS-N | HYDROGEN STORAGE VESSEL V-25001C VENT LINE | PC005 | PC005-4"-VL-172-01HSS-N | |
| 4"-VL-112-01HSS-N | HYDROGEN STORAGE VESSEL V-25001C VENT LINE | PC005 | PC005-4"-VL-112-01HSS-N | |

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| SCE TAG | DESCRIPTION | SCE GROUP | CODE | NOTE |
|---|---|---|---|---|
| 1"-HY-133-03HSS-N | FROM HYDROGEN STORAGE VESSEL V-25001C TO HYDROGEN STORAGE VESSELS HEADER (OUTLET) | PC005 | PC005-1"-HY-133-03HSS-N | |
| 1"-HY-187-03HSS-N | N2 CONNECTING LINE TO HYDROGEN STORAGE VESSEL V-25001C | PC005 | PC005-1"-HY-187-03HSS-N | |
| 1"-HY-174-03HSS-N | FROM HYDROGEN STORAGE VESSEL V-25001D TO 25-PSV-001D (VENT LINE) | PC005 | PC005-1"-HY-174-03HSS-N | |
| 3"-HY-175-03HSS-N | FROM HYDROGEN STORAGE VESSEL V-25001D TO 25-BDV-013/25-PV-013 (VENT LINE) | PC005 | PC005-3"-HY-175-03HSS-N | |
| 4"-VL-176-01HSS-N | HYDROGEN STORAGE VESSEL V-25001D VENT LINE | PC005 | PC005-4"-VL-176-01HSS-N | |
| 4"-VL-113-01HSS-N | HYDROGEN STORAGE VESSEL V-25001D VENT LINE | PC005 | PC005-4"-VL-113-01HSS-N | |
| 1"-HY-134-03HSS-N | FROM HYDROGEN STORAGE VESSEL V-25001D TO HYDROGEN STORAGE VESSELS HEADER (OUTLET) | PC005 | PC005-1"-HY-134-03HSS-N | |
| 1"-HY-188-03HSS-N | N2 CONNECTING LINE TO HYDROGEN STORAGE VESSEL V-25001D | PC005 | PC005-1"-HY-188-03HSS-N | |
| 1"-HY-179-03HSS-N | FROM HYDROGEN STORAGE VESSEL V-25001E TO 25-PSV-001E (VENT LINE) | PC005 | PC005-1"-HY-179-03HSS-N | |
| 3"-HY-180-03HSS-N | FROM HYDROGEN STORAGE VESSEL V-25001E TO 25-BDV-016/25-PV-016 (VENT LINE) | PC005 | PC005-3"-HY-180-03HSS-N | |
| 4"-VL-181-01HSS-N | HYDROGEN STORAGE VESSEL V-25001E VENT LINE | PC005 | PC005-4"-VL-181-01HSS-N | |
| 4"-VL-114-01HSS-N | HYDROGEN STORAGE VESSEL V-25001E VENT LINE | PC005 | PC005-4"-VL-114-01HSS-N | |
| 1"-HY-135-03HSS-N | FROM HYDROGEN STORAGE VESSEL V-25001E TO HYDROGEN STORAGE VESSELS HEADER (OUTLET) | PC005 | PC005-1"-HY-135-03HSS-N | |
| 1"-HY-189-03HSS-N | N2 CONNECTING LINE TO HYDROGEN STORAGE VESSEL V-25001E | PC005 | PC005-1"-HY-189-03HSS-N | |
| 1"-HY-183-03HSS-N | FROM HYDROGEN STORAGE VESSEL V-25001F TO 25-PSV-001F (VENT LINE) | PC005 | PC005-1"-HY-183-03HSS-N | |
| 3"-HY-184-03HSS-N | FROM HYDROGEN STORAGE VESSEL V-25001F TO 25-BDV-019/25-PV-019 (VENT LINE) | PC005 | PC005-3"-HY-184-03HSS-N | |
| 4"-VL-185-01HSS-N | HYDROGEN STORAGE VESSEL V-25001F VENT LINE | PC005 | PC005-4"-VL-185-01HSS-N | |
| 4"-VL-115-01HSS-N | HYDROGEN STORAGE VESSEL V-25001F VENT LINE | PC005 | PC005-4"-VL-115-01HSS-N | |

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| SCE TAG | DESCRIPTION | SCE GROUP | CODE | NOTE |
|---|---|---|---|---|
| 1"-HY-136-03HSS-N | FROM HYDROGEN STORAGE VESSEL V-25001F TO HYDROGEN STORAGE VESSELS HEADER (OUTLET) | PC005 | PC005-1"-HY-136-03HSS-N | |
| 1"-HY-190-03HSS-N | N2 CONNECTING LINE TO HYDROGEN STORAGE VESSEL V-25001F | PC005 | PC005-1"-HY-190-03HSS-N | |
| 1-1/2"-HY-148-03HSS-N | H2 COMMON OUTLET LINE FROM STORAGE VESSELS TO 25-SDV-023 | PC005 | PC005-1-1/2"-HY-148-03HSS-N | |
| 1"-HY-144-03HSS-N | H2 COMMON OUTLET LINE FROM STORAGE VESSELS TO 25-SDV-022 (VENT LINE) | PC005 | PC005-1"-HY-144-03HSS-N | |
| 1"-VL-022-01HSS-N | H2 COMMON OUTLET LINE FROM STORAGE VESSELS VENT LINE | PC005 | PC005-1"-VL-022-01HSS-N | |
| 2"-HY-023-01HSS-N | FROM HYDROGEN STORAGE VESSEL HEADER (OUTLET) TO FUEL CELL PACKAGE A-80000 | PC005 | PC005-2"-HY-023-01HSS-N | |
| 1"-HY-152-01HSS-N | INLET LINE OF FUEL CELL PACKAGE A-80000 TO 80-PSV-001 (VENT LINE) | PC005 | PC005-1"-HY-152-01HSS-N | |
| 2"-VL-010-01HSS-N | FUEL CELL PACKAGE A-80000 VENT LINE | PC005 | PC005-2"-VL-010-01HSS-N | |
| 1"-HY-163-01HSS-N | INLET LINE OF FUEL CELL PACKAGE A-80000 TO 80-XV-001 (VENT LINE) | PC005 | PC005-1"-HY-163-01HSS-N | |
| PC007 PRESSURE SAFETY VALVES (PSV) | | | | |
| 25-PSV-001A | PRESSURE SAFETY VALVE (FROM HYDROGEN STORAGE VESSEL V-25001A TO HYDROGEN VENT HEADER) | PC007 | PC007-25-PSV-001A | |
| 25-PSV-001B | PRESSURE SAFETY VALVE (FROM HYDROGEN STORAGE VESSEL V-25001B TO HYDROGEN VENT HEADER) | PC007 | PC007-25-PSV-001B | |
| 25-PSV-001C | PRESSURE SAFETY VALVE (FROM HYDROGEN STORAGE VESSEL V-25001C TO HYDROGEN VENT HEADER) | PC007 | PC007-25-PSV-001C | |
| 25-PSV-001D | PRESSURE SAFETY VALVE (FROM HYDROGEN STORAGE VESSEL V-25001D TO HYDROGEN VENT HEADER) | PC007 | PC007-25-PSV-001D | |
| 25-PSV-001E | PRESSURE SAFETY VALVE (FROM HYDROGEN STORAGE VESSEL V-25001E TO HYDROGEN VENT HEADER) | PC007 | PC007-25-PSV-001E | |
| 25-PSV-001F | PRESSURE SAFETY VALVE (FROM HYDROGEN STORAGE VESSEL V-25001F TO HYDROGEN VENT HEADER) | PC007 | PC007-25-PSV-001F | |

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|---|---|---|---|---|
| 80-PSV-001 | PRESSURE SAFETY VALVE ( FROM HYDROGEN STORAGE VESSELS HEADER (OUTLET) TO HYDROGEN VENT HEADER) | PC007 | PC007-80-PSV-001 | |
| IC001 HAZARDOUS AREA VENTILATION | | | | |
| BLPH-EXTRACTION FANS in A-8500 | EXTRACTION FANS IN BESS PACKAGE A-8500 | IC001 | IC002-BLPH-EXTRACTION FANS in A-8500 | |
| IC002 NON-HAZARDOUS AREA VENTILATION | | | | |
| BLPH-EXTRACTION FANS in B-300 | EXTRACTION FANS IN AC UPS ROOM B-300 | IC002 | IC002-BLPH-EXTRACTION FANS in B-300 | |
| IC003 CERTIFIED (EX RATED) ELEC EQPT | | | | |
| 25-PT-035 | ATEX Transmitter | IC003 | IC003-25-PT-035 | |
| 25-PT-037 | ATEX Transmitter | IC003 | IC003-25-PT-037 | |
| 25-PT-040 | ATEX Transmitter | IC003 | IC003-25-PT-040 | |
| 25-PT-043 | ATEX Transmitter | IC003 | IC003-25-PT-043 | |
| 25-PT-046 | ATEX Transmitter | IC003 | IC003-25-PT-046 | |
| 25-PT-049 | ATEX Transmitter | IC003 | IC003-25-PT-049 | |
| 43-FT-001 | ATEX Transmitter | IC003 | IC003-43-FT-001 | |
| 43-LT-003 | ATEX Transmitter | IC003 | IC003-43-LT-003 | |
| 43-LT-001 | ATEX Transmitter | IC003 | IC003-43-LT-001 | |
| 43-PT-001 | ATEX Transmitter | IC003 | IC003-43-PT-001 | |
| 25-FT-031 | ATEX Transmitter | IC003 | IC003-25-FT-031 | |
| 25-FT-032 | ATEX Transmitter | IC003 | IC003-25-FT-032 | |
| 25-FT-033 | ATEX Transmitter | IC003 | IC003-25-FT-033 | |
| 25-FT-034 | ATEX Transmitter | IC003 | IC003-25-FT-034 | |
| 25-FT-036 | ATEX Transmitter | IC003 | IC003-25-FT-036 | |

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| SCE TAG | DESCRIPTION | SCE GROUP | CODE | NOTE |
|---|---|---|---|---|
| 25-FT-038 | ATEX Transmitter | IC003 | IC003-25-FT-038 | |
| 25-PT-001 | ATEX Transmitter | IC003 | IC003-25-PT-001 | |
| 25-PT-055A | ATEX Transmitter | IC003 | IC003-25-PT-055A | |
| 25-PT-055B | ATEX Transmitter | IC003 | IC003-25-PT-055B | |
| 25-FE-031 | ATEX Instrument | IC003 | IC003-25-FE-031 | |
| 25-FE-032 | ATEX Instrument | IC003 | IC003-25-FE-032 | |
| 25-FE-033 | ATEX Instrument | IC003 | IC003-25-FE-033 | |
| 25-FE-034 | ATEX Instrument | IC003 | IC003-25-FE-034 | |
| 25-FE-036 | ATEX Instrument | IC003 | IC003-25-FE-036 | |
| 25-FE-038 | ATEX Instrument | IC003 | IC003-25-FE-038 | |
| 25-RO-024 | ATEX Instrument | IC003 | IC003-25-RO-024 | |
| 25-RO-005 | ATEX Instrument | IC003 | IC003-25-RO-005 | |
| 25-RO-008 | ATEX Instrument | IC003 | IC003-25-RO-008 | |
| 25-RO-010 | ATEX Instrument | IC003 | IC003-25-RO-010 | |
| 25-RO-013 | ATEX Instrument | IC003 | IC003-25-RO-013 | |
| 25-RO-016 | ATEX Instrument | IC003 | IC003-25-RO-016 | |
| 25-RO-019 | ATEX Instrument | IC003 | IC003-25-RO-019 | |
| 25-RO-022 | ATEX Instrument | IC003 | IC003-25-RO-022 | |
| 64-FG-001 | ATEX Instrument | IC003 | IC003-64-FG-001 | |
| 80-RO-001 | ATEX Instrument | IC003 | IC003-80-RO-001 | |
| 25-FY-031 | ATEX Instrument | IC003 | IC003-25-FY-031 | |
| 25-FY-032 | ATEX Instrument | IC003 | IC003-25-FY-032 | |
| 25-FY-033 | ATEX Instrument | IC003 | IC003-25-FY-033 | |
| 25-FY-034 | ATEX Instrument | IC003 | IC003-25-FY-034 | |

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| SCE TAG | DESCRIPTION | SCE GROUP | CODE | NOTE |
|---|---|---|---|---|
| 25-FY-036 | ATEX Instrument | IC003 | IC003-25-FY-036 | |
| 25-FY-038 | ATEX Instrument | IC003 | IC003-25-FY-038 | |
| 25-PY-035 | ATEX Instrument | IC003 | IC003-25-PY-035 | |
| 25-PY-037 | ATEX Instrument | IC003 | IC003-25-PY-037 | |
| 25-PY-040 | ATEX Instrument | IC003 | IC003-25-PY-040 | |
| 25-PY-043 | ATEX Instrument | IC003 | IC003-25-PY-043 | |
| 25-PY-046 | ATEX Instrument | IC003 | IC003-25-PY-046 | |
| 25-PY-049 | ATEX Instrument | IC003 | IC003-25-PY-049 | |
| 25-PY-055A | ATEX Instrument | IC003 | IC003-25-PY-055A | |
| 25-PY-055B | ATEX Instrument | IC003 | IC003-25-PY-055B | |
| 43-LY-031 | ATEX Instrument | IC003 | IC003-43-LY-031 | |
| 25-XV-004 | ATEX ActuatedValve | IC003 | IC003-25-XV-004 | |
| 25-XV-006 | ATEX ActuatedValve | IC003 | IC003-25-XV-006 | |
| 25-XV-008 | ATEX ActuatedValve | IC003 | IC003-25-XV-008 | |
| 25-XV-009 | ATEX ActuatedValve | IC003 | IC003-25-XV-009 | |
| 25-XV-011 | ATEX ActuatedValve | IC003 | IC003-25-XV-011 | |
| 25-XV-012 | ATEX ActuatedValve | IC003 | IC003-25-XV-012 | |
| 25-XV-014 | ATEX ActuatedValve | IC003 | IC003-25-XV-014 | |
| 25-XV-015 | ATEX ActuatedValve | IC003 | IC003-25-XV-015 | |
| 25-XV-017 | ATEX ActuatedValve | IC003 | IC003-25-XV-017 | |
| 25-XV-018 | ATEX ActuatedValve | IC003 | IC003-25-XV-018 | |
| 25-XV-020 | ATEX ActuatedValve | IC003 | IC003-25-XV-020 | |
| 25-XV-021 | ATEX ActuatedValve | IC003 | IC003-25-XV-021 | |
| 64-SDV-001 | ATEX ActuatedValve | IC003 | IC003-64-SDV-001 | |

| SCE TAG | DESCRIPTION | SCE GROUP | CODE | NOTE |
|---|---|---|---|---|
| 80-XV-001 | ATEX ActuatedValve | IC003 | IC003-80-XV-001 | |
| 25-XV-024 | ATEX ActuatedValve | IC003 | IC003-25-XV-024 | |
| IC005 ELEC EARTHING CONTINUITY&BONDING | | | | |
| BLPH -AIR TERMINAL RODS | LIGHTNING PROTECTION SYSTEM - AIR TERMINAL RODS | IC005 | IC005-BLPH -AIR TERMINAL RODS | |
| BLPH - SPDs | LIGHTNING PROTECTION SYSTEM - SURGE PROTECTION DEVICES | IC005 | IC005-BLPH - SPDs | |
| IC007 INERT GAS BLANKET SYSTEM | | | | |
| 64-AT-051 | OXYGEN ANALYZER LOCATED INSIDE NITROGEN GENERATION PAKAGE A-64000 | IC007 | IC007-64-AT-051 | |
| 64-PT-059 | 64-PT-059 LOCATED ON NITROGEN RECIEVER V-64001 (INSIDE NITROGEN GENERATION PAKAGE A-64000) | IC007 | IC007-64-PT-059 | |
| 64-PT-002 | 64-PT-002 LOCATED ON NITROGEN HEADER | IC007 | IC007-64-PT-002 | |
| DS001 FIRE AND GAS DETECTION | | | | |
| 950FZ-03101 | UV-IR FLAME DETECTOR ELECTROLYZER AREA, UPPER DECK | DS001 | DS001-950FZ-03101 | |
| 950FZ-03102 | UV-IR FLAME DETECTOR ELECTROLYZER AREA, UPPER DECK | DS001 | DS001-950FZ-03102 | |
| 950FZ-03103 | UV-IR FLAME DETECTOR ELECTROLYZER AREA, UPPER DECK | DS001 | DS001-950FZ-03103 | |
| 950FZ-03104 | UV-IR FLAME DETECTOR ELECTROLYZER AREA, UPPER DECK | DS001 | DS001-950FZ-03104 | |
| 950GZ-03101 | ULTRA SONIC HYDROGEN DETECTOR ELECTROLYZER AREA, UPPER DECK | DS001 | DS001-950GZ-03101 | |
| 950GZ-03102 | ULTRA SONIC HYDROGEN DETECTOR ELECTROLYZER AREA, UPPER DECK | DS001 | DS001-950GZ-03102 | |
| 950GZ-03103 | ULTRA SONIC HYDROGEN DETECTOR ELECTROLYZER AREA, UPPER DECK | DS001 | DS001-950GZ-03103 | |
| 950GZ-03104 | ULTRA SONIC HYDROGEN DETECTOR ELECTROLYZER AREA, UPPER DECK | DS001 | DS001-950GZ-03104 | |
| 950GZ-03105 | ULTRA SONIC HYDROGEN DETECTOR ELECTROLYZER AREA, UPPER DECK | DS001 | DS001-950GZ-03105 | |

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| SCE TAG | DESCRIPTION | SCE GROUP | CODE | NOTE |
|---|---|---|---|---|
| 950GZ-03106 | ULTRA SONIC HYDROGEN DETECTOR ELECTROLYZER AREA, UPPER DECK | DS001 | DS001-950GZ-03106 | |
| 950GZ-03107 | POINT SOURCE OXYGEN DETECTOR ELECTROLYZER AREA, UPPER DECK | DS001 | DS001-950GZ-03107 | |
| 950GZ-03108 | POINT SOURCE OXYGEN DETECTOR ELECTROLYZER AREA, UPPER DECK | DS001 | DS001-950GZ-03108 | |
| 950GZ-03109 | POINT SOURCE OXYGEN DETECTOR ELECTROLYZER AREA, UPPER DECK | DS001 | DS001-950GZ-03109 | |
| 950GZ-02109 | POINT SOURCE HYDROGEN DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950GZ-02109 | |
| 950GZ-02110 | POINT SOURCE HYDROGEN DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950GZ-02110 | |
| 950GZ-02111 | POINT SOURCE HYDROGEN DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950GZ-02111 | |
| 950GZ-02112 | POINT SOURCE HYDROGEN DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950GZ-02112 | |
| 950GZ-02113 | POINT SOURCE HYDROGEN DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950GZ-02113 | |
| 950GZ-02114 | POINT SOURCE HYDROGEN DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950GZ-02114 | |
| 950GZ-02115 | POINT SOURCE HYDROGEN DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950GZ-02115 | |
| 950GZ-02116 | POINT SOURCE HYDROGEN DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950GZ-02116 | |
| 950FZ-02101 | UV-IR FLAME DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950FZ-02101 | |
| 950FZ-02102 | UV-IR FLAME DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950FZ-02102 | |
| 950FZ-02103 | UV-IR FLAME DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950FZ-02103 | |
| 950FZ-02104 | UV-IR FLAME DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950FZ-02104 | |
| 950GZ-02117 | ULTRA SONIC HYDROGEN DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950GZ-02117 | |

| SCE TAG | DESCRIPTION | SCE GROUP | CODE | NOTE |
|---|---|---|---|---|
| 950GZ-02118 | ULTRA SONIC HYDROGEN DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950GZ-02118 | |
| 950GZ-02119 | ULTRA SONIC HYDROGEN DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950GZ-02119 | |
| 950GZ-02120 | ULTRA SONIC HYDROGEN DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950GZ-02120 | |
| 950GZ-02101 | POINT SOURCE HYDROGEN DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950GZ-02101 | |
| 950GZ-02102 | POINT SOURCE HYDROGEN DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950GZ-02102 | |
| 950GZ-02103 | POINT SOURCE HYDROGEN DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950GZ-02103 | |
| 950GZ-02104 | POINT SOURCE HYDROGEN DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950GZ-02104 | |
| 950GZ-02105 | POINT SOURCE HYDROGEN DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950GZ-02105 | |
| 950GZ-02106 | POINT SOURCE HYDROGEN DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950GZ-02106 | |
| 950GZ-02107 | POINT SOURCE HYDROGEN DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950GZ-02107 | |
| 950GZ-02108 | POINT SOURCE HYDROGEN DETECTOR STORAGE AREA, UPPER DECK | DS001 | DS001-950GZ-02108 | |
| 950FZ-01101 | UV-IR FLAME DETECTOR FUEL CELL AREA, UPPER DECK | DS001 | DS001-950FZ-01101 | |
| 950FZ-01102 | UV-IR FLAME DETECTOR FUEL CELL AREA, UPPER DECK | DS001 | DS001-950FZ-01102 | |
| 950FZ-01103 | UV-IR FLAME DETECTOR FUEL CELL AREA, UPPER DECK | DS001 | DS001-950FZ-01103 | |
| 950FZ-01104 | UV-IR FLAME DETECTOR FUEL CELL AREA, UPPER DECK | DS001 | DS001-950FZ-01104 | |
| 950GZ-01101 | ULTRA SONIC HYDROGEN DETECTOR FUEL CELL AREA, UPPER DECK | DS001 | DS001-950GZ-01101 | |
| 950GZ-01102 | ULTRA SONIC HYDROGEN DETECTOR FUEL CELL AREA, UPPER DECK | DS001 | DS001-950GZ-01102 | |

| SCE TAG | DESCRIPTION | SCE GROUP | CODE | NOTE |
|---|---|---|---|---|
| 950GZ-06201 | POINT SOURCE HYDROGEN DETECTOR IN B-100 HV/MV SWITCHROOM, LOWER DECK | DS001 | DS001-950GZ-06201 | |
| 950GZ-06202 | POINT SOURCE HYDROGEN DETECTOR IN B-100 HV/MV SWITCHROOM, LOWER DECK | DS001 | DS001-950GZ-06202 | |
| 950GZ-06203 | POINT SOURCE HYDROGEN DETECTOR IN B-100 HV/MV SWITCHROOM, LOWER DECK | DS001 | DS001-950GZ-06203 | |
| 950GZ-06204 | POINT SOURCE HYDROGEN DETECTOR IN B-100 HV/MV SWITCHROOM, LOWER DECK | DS001 | DS001-950GZ-06204 | |
| 950GZ-06205 | POINT SOURCE HYDROGEN DETECTOR IN B-100 HV/MV SWITCHROOM, LOWER DECK | DS001 | DS001-950GZ-06205 | |
| 950GZ-06206 | POINT SOURCE HYDROGEN DETECTOR IN B-100 HV/MV SWITCHROOM, LOWER DECK | DS001 | DS001-950GZ-06206 | |
| 950FZ-05101 | UV-IR FLAME DETECTOR BESS AREA, LOWER DECK | DS001 | DS001-950FZ-05101 | |
| 950FZ-05102 | UV-IR FLAME DETECTOR BESS AREA, LOWER DECK | DS001 | DS001-950FZ-05102 | |
| 950FZ-05103 | UV-IR FLAME DETECTOR BESS AREA, LOWER DECK | DS001 | DS001-950FZ-05103 | |
| 950FZ-05104 | UV-IR FLAME DETECTOR BESS AREA, LOWER DECK | DS001 | DS001-950FZ-05104 | |
| 950GZ-05101 | POINT SOURCE HYDROGEN DETECTOR BESS AREA, LOWER DECK | DS001 | DS001-950GZ-05101 | |
| 950GZ-05102 | POINT SOURCE HYDROGEN DETECTOR BESS AREA, LOWER DECK | DS001 | DS001-950GZ-05102 | |
| 950GZ-05103 | POINT SOURCE HYDROGEN DETECTOR BESS AREA, LOWER DECK | DS001 | DS001-950GZ-05103 | |
| 950GZ-04213 | POINT SOURCE HYDROGEN DETECTOR IN B-200 LV SWITCHROOM, LOWER DECK | DS001 | DS001-950GZ-04213 | |
| 950GZ-04214 | POINT SOURCE HYDROGEN DETECTOR IN B-200 LV SWITCHROOM, LOWER DECK | DS001 | DS001-950GZ-04214 | |
| 950GZ-04215 | POINT SOURCE HYDROGEN DETECTOR IN B-200 LV SWITCHROOM, LOWER DECK | DS001 | DS001-950GZ-04215 | |
| 950GZ-04216 | POINT SOURCE HYDROGEN DETECTOR IN B-200 LV SWITCHROOM, LOWER DECK | DS001 | DS001-950GZ-04216 | |
| 950GZ-04217 | POINT SOURCE HYDROGEN DETECTOR IN B-200 LV SWITCHROOM, LOWER DECK | DS001 | DS001-950GZ-04217 | |

| SCE TAG | DESCRIPTION | SCE GROUP | CODE | NOTE |
|---|---|---|---|---|
| 950GZ-04218 | POINT SOURCE HYDROGEN DETECTOR IN B-200 LV SWITCHROOM, LOWER DECK | DS001 | DS001-950GZ-04218 | |
| 950GZ-04207 | POINT SOURCE HYDROGEN DETECTOR IN B-300 AC UPS ROOM, LOWER DECK | DS001 | DS001-950GZ-04207 | |
| 950GZ-04208 | POINT SOURCE HYDROGEN DETECTOR IN B-300 AC UPS ROOM, LOWER DECK | DS001 | DS001-950GZ-04208 | |
| 950GZ-04209 | POINT SOURCE HYDROGEN DETECTOR IN B-300 AC UPS ROOM, LOWER DECK | DS001 | DS001-950GZ-04209 | |
| 950GZ-04210 | POINT SOURCE HYDROGEN DETECTOR IN B-300 AC UPS ROOM, LOWER DECK | DS001 | DS001-950GZ-04210 | |
| 950GZ-04211 | POINT SOURCE HYDROGEN DETECTOR IN B-300 AC UPS ROOM, LOWER DECK | DS001 | DS001-950GZ-04211 | |
| 950GZ-04212 | POINT SOURCE HYDROGEN DETECTOR IN B-300 AC UPS ROOM, LOWER DECK | DS001 | DS001-950GZ-04212 | |
| 950GZ-04201 | POINT SOURCE HYDROGEN DETECTOR IN B-400, I&T ROOM, LOWER DECK | DS001 | DS001-950GZ-04201 | |
| 950GZ-04202 | POINT SOURCE HYDROGEN DETECTOR IN B-400, I&T ROOM, LOWER DECK | DS001 | DS001-950GZ-04202 | |
| 950GZ-04203 | POINT SOURCE HYDROGEN DETECTOR IN B-400, I&T ROOM, LOWER DECK | DS001 | DS001-950GZ-04203 | |
| 950GZ-04204 | POINT SOURCE HYDROGEN DETECTOR IN B-400, I&T ROOM, LOWER DECK | DS001 | DS001-950GZ-04204 | |
| 950GZ-04205 | POINT SOURCE HYDROGEN DETECTOR IN B-400, I&T ROOM, LOWER DECK | DS001 | DS001-950GZ-04205 | |
| 950GZ-04206 | POINT SOURCE HYDROGEN DETECTOR IN B-400, I&T ROOM, LOWER DECK | DS001 | DS001-950GZ-04206 | |
| 950XZ-01101 | SOUNDER, EXTERNAL AREA OF FUEL CELL, UPPER DECK | DS001 | DS001-950XZ-01101 | |
| 950XL-01101 | FLAMMABLE GAS RELEASE BEACON, EXTERNAL AREA OF FUEL CELL, UPPER DECK | DS001 | DS001-950XL-01101 | |
| 950XL-01102 | FIRE BEACON, EXTERNAL AREA OF FUEL CELL, UPPER DECK | DS001 | DS001-950XL-01102 | |

| SCE TAG | DESCRIPTION | SCE GROUP | CODE | NOTE |
|---|---|---|---|---|
| 950MFA-01101 | MANUAL FIRE ALARM, EXTERNAL AREA OF FUEL CELL, UPPER DECK | DS001 | DS001-950MFA-01101 | |
| 950ASD-01101 | ABANDON SHUTDOWN, EXTERNAL AREA OF FUEL CELL, UPPER DECK | DS001 | DS001-950ASD-01101 | |
| 950MOB-01101 | MAN OVER BOARD, EXTERNAL AREA OF FUEL CELL, UPPER DECK | DS001 | DS001-950MOB-01101 | |
| 950XZ-01102 | SOUNDER, EXTERNAL AREA OF FUEL CELL TRANSFORMER, UPPER DECK | DS001 | DS001-950XZ-01102 | |
| 950MFA-01102 | MANUAL FIRE ALARM, EXTERNAL AREA OF FUEL CELL TRANSFORMER, UPPER DECK | DS001 | DS001-950MFA-01102 | |
| 950MFA-01103 | MANUAL FIRE ALARM,EXTERNAL AREA OF FUEL CELL, UPPER DECK | DS001 | DS001-950MFA-01103 | |
| 950XZ-02101 | SOUNDER, STORAGE AREA, UPPER DECK | DS001 | DS001-950XZ-02101 | |
| 950XL-02101 | FLAMMABLE GAS RELEASE BEACON, STORAGE AREA, UPPER DECK | DS001 | DS001-950XL-02101 | |
| 950XL-02102 | FIRE BEACON, STORAGE AREA, UPPER DECK | DS001 | DS001-950XL-02102 | |
| 950MFA-02101 | MANUAL FIRE ALARM, STORAGE AREA, UPPER DECK | DS001 | DS001-950MFA-02101 | |
| 950XZ-03101 | SOUNDER, EXTERNAL AREA OF ELECTROLYZER, UPPER DECK | DS001 | DS001-950XZ-03101 | |
| 950MFA-03101 | MANUAL FIRE ALARM, EXTERNAL AREA OF ELECTROLYZER, UPPER DECK | DS001 | DS001-950MFA-03101 | |
| 950XZ-03102 | SOUNDER, EXTERNAL AREA OF ELECTROLYZER, UPPER DECK | DS001 | DS001-950XZ-03102 | |
| 950MFA-03102 | MANUAL FIRE ALARM, EXTERNAL AREA OF ELECTROLYZER, UPPER DECK | DS001 | DS001-950MFA-03102 | |
| 950XL-03101 | FLAMMABLE GAS RELEASE BEACON, EXTERNAL AREA OF ELECTROLYZER, UPPER DECK | DS001 | DS001-950XL-03101 | |
| 950XL-03102 | FIRE BEACON, EXTERNAL AREA OF ELECTROLYZER, UPPER DECK | DS001 | DS001-950XL-03102 | |
| 950MFA-03103 | MANUAL FIRE ALARM, EXTERNAL AREA OF ELECTROLYZER, UPPER DECK | DS001 | DS001-950MFA-03103 | |
| 950XL-03103 | FLAMMABLE GAS RELEASE BEACON, EXTERNAL AREA OF UV WATER FILTER, UPPER DECK | DS001 | DS001-950XL-03103 | |

| SCE TAG | DESCRIPTION | SCE GROUP | CODE | NOTE |
|---|---|---|---|---|
| 950XL-03104 | FIRE BEACON, EXTERNAL AREA OF UV WATER FILTER, UPPER DECK | DS001 | DS001-950XL-03104 | |
| 950MFA-03104 | MANUAL FIRE ALARM, EXTERNAL AREA OF UV WATER FILTER, UPPER DECK | DS001 | DS001-950MFA-03104 | |
| 950ASD-03101 | ABANDON SHUTDOWN, EXTERNAL AREA OF UV WATER FILTER, UPPER DECK | DS001 | DS001-950ASD-03101 | |
| 950MOB-03101 | MAN OVER BOARD, EXTERNAL AREA OF UV WATER FILTER, UPPER DECK | DS001 | DS001-950MOB-03101 | |
| 950XL-06101 | FLAMMABLE GAS RELEASE BEACON, EXTERNAL AREA OF B-100 HV/MV SWITCHROOM, LOWER DECK | DS001 | DS001-950XL-06101 | |
| 950XL-06102 | FIRE BEACON, EXTERNAL AREA OF B-100 HV/MV SWITCHROOM, LOWER DECK | DS001 | DS001-950XL-06102 | |
| 950MFA-06101 | MANUAL FIRE ALARM, EXTERNAL AREA OF B-100 HV/MV SWITCHROOM, LOWER DECK | DS001 | DS001-950MFA-06101 | |
| 950ASD-06101 | ABANDON SHUTDOWN, EXTERNAL AREA OF B-100 HV/MV SWITCHROOM, LOWER DECK | DS001 | DS001-950ASD-06101 | |
| 950MOB-06101 | MAN OVER BOARD, EXTERNAL AREA OF B-100 HV/MV SWITCHROOM, LOWER DECK | DS001 | DS001-950MOB-06101 | |
| 950XZ-06201 | SOUNDER IN B-100 HV/MV SWITCHROOM, LOWER DECK | DS001 | DS001-950XZ-06201 | |
| 950XL-06201 | FLAMMABLE GAS RELEASE BEACON IN B-100 HV/MV SWITCHROOM, LOWER DECK | DS001 | DS001-950XL-06201 | |
| 950XL-06202 | FIRE BEACON IN B-100 HV/MV SWITCHROOM, LOWER DECK | DS001 | DS001-950XL-06202 | |
| 950MFA-06201 | MANUAL FIRE ALARM IN B-100 HV/MV SWITCHROOM, LOWER DECK | DS001 | DS001-950MFA-06201 | |
| 950XL-06103 | FLAMMABLE GAS RELEASE BEACON, EXTERNAL AREA OF B-100 HV/MV SWITCHROOM, LOWER DECK | DS001 | DS001-950XL-06103 | |
| 950XL-06104 | FIRE BEACON, EXTERNAL AREA OF B-100 HV/MV SWITCHROOM, LOWER DECK | DS001 | DS001-950XL-06104 | |
| 950MFA-06102 | MANUAL FIRE ALARM, EXTERNAL AREA OF B-100 HV/MV SWITCHROOM, LOWER DECK | DS001 | DS001-950MFA-06102 | |
| 950XZ-05101 | SOUNDER, BESS AREA, LOWER DECK | DS001 | DS001-950XZ-05101 | |

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| SCE TAG | DESCRIPTION | SCE GROUP | CODE | NOTE |
|---|---|---|---|---|
| 950MFA-05101 | MANUAL FIRE ALARM, BESS AREA, LOWER DECK | DS001 | DS001-950MFA-05101 | |
| 950XZ-05102 | SOUNDER, BESS AREA, LOWER DECK | DS001 | DS001-950XZ-05102 | |
| 950MFA-05102 | MANUAL FIRE ALARM, BESS AREA, LOWER DECK | DS001 | DS001-950MFA-05102 | |
| 950XZ-05103 | SOUNDER, BESS AREA, LOWER DECK | DS001 | DS001-950XZ-05103 | |
| 950MFA-05103 | MANUAL FIRE ALARM, BESS AREA, LOWER DECK | DS001 | DS001-950MFA-05103 | |
| 950XZ-04201 | SOUNDER IN B-400, I&T ROOM, LOWER DECK | DS001 | DS001-950XZ-04201 | |
| 950XL-04201 | FLAMMABLE GAS RELEASE BEACON IN B-400, I&T ROOM, LOWER DECK | DS001 | DS001-950XL-04201 | |
| 950XL-04202 | FIRE BEACON IN B-400, I&T ROOM, LOWER DECK | DS001 | DS001-950XL-04202 | |
| 950MFA-04201 | MANUAL FIRE ALARM IN B-400, I&T ROOM, LOWER DECK | DS001 | DS001-950MFA-04201 | |
| 950XZ-04202 | SOUNDER IN B-300 AC UPS ROOM, LOWER DECK | DS001 | DS001-950XZ-04202 | |
| 950XL-04203 | FLAMMABLE GAS RELEASE BEACON IN B-300 AC UPS ROOM, LOWER DECK | DS001 | DS001-950XL-04203 | |
| 950XL-04204 | FIRE BEACON IN B-300 AC UPS ROOM, LOWER DECK | DS001 | DS001-950XL-04204 | |
| 950MFA-04202 | MANUAL FIRE ALARM IN B-300 AC UPS ROOM, LOWER DECK | DS001 | DS001-950MFA-04202 | |
| 950XZ-04203 | SOUNDER IN B-200 LV SWITCHROOM, LOWER DECK | DS001 | DS001-950XZ-04203 | |
| 950XL-04205 | FLAMMABLE GAS RELEASE BEACON IN B-200 LV SWITCHROOM, LOWER DECK | DS001 | DS001-950XL-04205 | |
| 950XL-04206 | FIRE BEACON IN B-200 LV SWITCHROOM, LOWER DECK | DS001 | DS001-950XL-04206 | |
| 950MFA-04203 | MANUAL FIRE ALARM IN B-200 LV SWITCHROOM, LOWER DECK | DS001 | DS001-950MFA-04203 | |
| 950XZ-04102 | SOUNDER, EXTERNAL AREA OF B-400 I&T ROOM, LOWER DECK | DS001 | DS001-950XZ-04102 | |
| 950MFA-04102 | MANUAL FIRE ALARM, EXTERNAL AREA OF B-400 I&T ROOM, LOWER DECK | DS001 | DS001-950MFA-04102 | |
| 950XZ-04101 | SOUNDER, EXTERNAL AREA OF B-400 I&T ROOM, LOWER DECK | DS001 | DS001-950XZ-04101 | |
| 950XL-04101 | FLAMMABLE GAS RELEASE BEACON, EXTERNAL AREA OF B-400 I&T ROOM, LOWER DECK | DS001 | DS001-950XL-04101 | |

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| SCE TAG | DESCRIPTION | SCE GROUP | CODE | NOTE |
|---|---|---|---|---|
| 950XL-04102 | FIRE BEACON, EXTERNAL AREA OF B-400 I&T ROOM, LOWER DECK | DS001 | DS001-950XL-04102 | |
| 950MFA-04101 | MANUAL FIRE ALARM,EXTERNAL AREA OF B-400 I&T ROOM, LOWER DECK | DS001 | DS001-950MFA-04101 | |
| 950ASD-04101 | ABANDON SHUTDOWN, EXTERNAL AREA OF B-400 I&T ROOM, LOWER DECK | DS001 | DS001-950ASD-04101 | |
| 950MOB-04101 | MAN OVER BOARD, EXTERNAL AREA OF B-400 I&T ROOM, LOWER DECK | DS001 | DS001-950MOB-04101 | |
| 950XZ-07101 | SOUNDER, WASTE WATER TANK AREA, EXISTING PLATFORM | DS001 | DS001-950XZ-07101 | |
| 950XL-07101 | FLAMMABLE GAS RELEASE BEACON, WASTE WATER TANK AREA, EXISTING PLATFORM | DS001 | DS001-950XL-07101 | |
| 950XL-07102 | FIRE BEACON, WASTE WATER TANK AREA, EXISTING PLATFORM | DS001 | DS001-950XL-07102 | |
| 950MFA-07102 | MANUAL FIRE ALARM, WASTE WATER TANK AREA, EXISTING PLATFORM | DS001 | DS001-950MFA-07102 | |
| 950ASD-07101 | ABANDON SHUTDOWN, WASTE WATER TANK AREA, EXISTING PLATFORM | DS001 | DS001-950ASD-07101 | |
| 950MOB-07101 | MAN OVER BOARD,WASTE WATER TANK AREA, EXISTING PLATFORM | DS001 | DS001-950MOB-07101 | |
| PS002 FIRE AND EXPLOSION PROTECTION | | | | |
| BLPH-DECK PLATING | BLPH-DECK PLATING | PS002 | PS002-BLPH-DECK PLATING | |
| BLPH-EXTINGUISHER | PORTABLE FIRE EXTINGUISHER | PS002 | PS002-BLPH-EXTINGUISHER | |
| PS015 COLLISION AVOIDANCE SYSTEM | | | | |
| BLPH-RACON | RADAR TRASPONDIND BEACON (RACON) | PS015 | PS015-BLPH-RACON | |
| BLPH-NAV AIDS | VISUAL NAVIGATION AIDS | PS015 | PS015-BLPH-NAV AIDS | |
| BLPH-MARINE LIGHTS | MARINE LIGHTS & OBSTRUCTION LIGHTS | PS015 | PS015-BLPH-MARINE LIGHTS | |
| BLPH-AERO AIS | AUTOMATIC IDENTIFICATION SYSTEM (AIS) | PS015 | PS015-BLPH-AERO AIS | |
| SD001 EMERGENCY SHUTDOWN SYSTEM | | | | |
| 25-PT-002 | 25-PT-002 LOCATED ON COMMON LINE TO STORAGE VESSELS | SD001 | SD001-25-PT-002 | |

| SCE TAG | DESCRIPTION | SCE GROUP | CODE | NOTE |
|---|---|---|---|---|
| 25-PT-004 | 25-PT-004 LOCATED ON STORAGE VESSEL V-25001A | SD001 | SD001-25-PT-004 | |
| 25-PT-006 | 25-PT-006 LOCATED ON STORAGE VESSEL V-25001B | SD001 | SD001-25-PT-006 | |
| 25-PT-008 | 25-PT-008 LOCATED ON STORAGE VESSEL V-25001C | SD001 | SD001-25-PT-008 | |
| 25-PT-009 | 25-PT-009 LOCATED ON STORAGE VESSEL V-25001D | SD001 | SD001-25-PT-009 | |
| 25-PT-011 | 25-PT-011 LOCATED ON STORAGE VESSEL V-25001E | SD001 | SD001-25-PT-011 | |
| 25-PT-012 | 25-PT-012 LOCATED ON STORAGE VESSEL V-25001F | SD001 | SD001-25-PT-012 | |
| 80-PT-002 | 80-PT-002 LOCATED ON COMMON LINE TO FUEL CELL PACKAGE | SD001 | SD001-80-PT-002 | |
| 950ESD-01101 | ESD-1 PUSH BUTTON, EXTERNAL AREA OF FUEL CELL, UPPER DECK | SD001 | SD001-950ESD-01101 | |
| 950ESDD-01101 | ESD-1D PUSH BUTTON, EXTERNAL AREA OF FUEL CELL, UPPER DECK | SD001 | SD001-950ESDD-01101 | |
| 950ESD-03101 | ESD-1 PUSH BUTTON, EXTERNAL AREA OF UV WATER FILTER, UPPER DECK | SD001 | SD001-950ESD-03101 | |
| 950ESDD-03101 | ESD-1D PUSH BUTTON, EXTERNAL AREA OF UV WATER FILTER, UPPER DECK | SD001 | SD001-950ESDD-03101 | |
| 950ESD-06101 | ESD-1 PUSH BUTTON, EXTERNAL AREA OF B-100 HV/MV SWITCHROOM, LOWER DECK | SD001 | SD001-950ESD-06101 | |
| 950ESDD-06101 | ESD-1D PUSH BUTTON, EXTERNAL AREA OF B-100 HV/MV SWITCHROOM, LOWER DECK | SD001 | SD001-950ESDD-06101 | |
| 950ESD-04101 | ESD-1 PUSH BUTTON, EXTERNAL AREA OF B-400 I&T ROOM, LOWER DECK | SD001 | SD001-950ESD-04101 | |
| 950ESDD-04101 | ESD-1D PUSH BUTTON, EXTERNAL AREA OF B-400 I&T ROOM, LOWER DECK | SD001 | SD001-950ESDD-04101 | |
| 950ESD-07101 | ESD-1 PUSH BUTTON, WASTE WATER TANK AREA, EXISTING PLATFORM | SD001 | SD001-950ESD-07101 | |
| 950ESDD-07101 | ESD-1D PUSH BUTTON, WASTE WATER TANK AREA, EXISTING PLATFORM | SD001 | SD001-950ESDD-07101 | |

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| SCE TAG | DESCRIPTION | SCE GROUP | CODE | NOTE |
|---|---|---|---|---|
| SD002 BLOWDOWN VALVES VALVES (BDV) | | | | |
| 25-BDV-003 | BLOWDOWN VALVE (FROM STORAGE INLET LINE TO HYDROGEN VENT HEADER) | SD002 | SD002-25-BDV-003 | |
| 25-BDV-005 | BLOWDOWN VALVE (FROM HYDROGEN STORAGE VESSEL V-25001A TO HYDROGEN VENT HEADER) | SD002 | SD002-25-BDV-005 | |
| 25-BDV-007 | BLOWDOWN VALVE (FROM HYDROGEN STORAGE VESSEL V-25001B TO HYDROGEN VENT HEADER) | SD002 | SD002-25-BDV-007 | |
| 25-BDV-010 | BLOWDOWN VALVE (FROM HYDROGEN STORAGE VESSEL V-25001C TO HYDROGEN VENT HEADER) | SD002 | SD002-25-BDV-010 | |
| 25-BDV-013 | BLOWDOWN VALVE (FROM HYDROGEN STORAGE VESSEL V-25001D TO HYDROGEN VENT HEADER) | SD002 | SD002-25-BDV-013 | |
| 25-BDV-016 | BLOWDOWN VALVE (FROM HYDROGEN STORAGE VESSEL V-25001E TO HYDROGEN VENT HEADER) | SD002 | SD002-25-BDV-016 | |
| 25-BDV-019 | BLOWDOWN VALVE (FROM HYDROGEN STORAGE VESSEL V-25001F TO HYDROGEN VENT HEADER) | SD002 | SD002-25-BDV-019 | |
| 25-BDV-022 | BLOWDOWN VALVE (MAIN LINE FROM HYDROGEN STORAGE VESSELS TO HYDROGEN VENT HEADER) | SD002 | SD002-25-BDV-022 | |
| SD006 EMERGENCY SHUTDOWN VALVE (SDV) | | | | |
| 25-SDV-001 | SHUTDOWN VALVE (MAIN LINE FROM ELECTROLYSER PACKAGE A-20000 TO HYDROGEN VESSELS ) | SD006 | SD006-25-SDV-001 | |
| 25-SDV-023 | SHUTDOWN VALVE (MAIN LINE FROM HYDROGEN STORAGE VESSELS TO FUEL CELL PACKAGE) | SD006 | SD006-25-SDV-023 | |
| SD009 UTILITY AIR | | | | |
| K-63001A | INSTRUMENT AIR COMPRESSOR / MOTOR (INSIDE INSTRUMENT AIR PACKAGE A-63000) | SD006 | SD006-K-63001A | |
| K-63001B | INSTRUMENT AIR COMPRESSOR / MOTOR (INSIDE INSTRUMENT AIR PACKAGE A-63000) | SD006 | SD006-K-63001B | |
| 63-PT-064 | 63-PT-064 LOCATED ON INSTRUMENT AIR RECIEVER V-63001 (INSIDE INSTRUMENT AIR PACKAGE A-63000) | SD006 | SD006-63-PT-064 | |
| 63-PT-004 | 63-PT-004 LOCATED ON INSTRUMENT AIR HEADER | SD006 | SD006-63-PT-004 | |

| SCE TAG | DESCRIPTION | SCE GROUP | CODE | NOTE |
|---|---|---|---|---|
| ER001 MUSTER AREA | | | | |
| BLPH- PRIMARY MUSTER AREA | PRIMARY MUSTER AREA | ER001 | ER001-BLPH- PRIMARY MUSTER AREA | |
| BLPH- SECONDARY MUSTER AREA | SECONDARY MUSTER AREA | ER001 | ER001-BLPH- SECONDARY MUSTER AREA | |
| ER002 ESCAPE ROUTES | | | | |
| BLPH- PRIMARY ESCAPE ROUTES | PRIMARY ESCAPE ROUTES | ER002 | ER002-BLPH- PRIMARY ESCAPE ROUTES | |
| BLPH- SECONDARY ESCAPE ROUTES | SECONDARY ESCAPE ROUTES | ER002 | ER002-BLPH- SECONDARY ESCAPE ROUTES | |
| ER003 EMERGENCY / ESCAPE LIGHTING | | | | |
| BLPH- EM LIGHTING PANEL | EMERGENCY LIGHTING PANEL | ER003 | ER003-BLPH- EM LIGHTING PANEL | |
| BLPH-EMERGENCY LIGHTS | EMERGENCY LIGHTS | ER003 | ER003-BLPH-EMERGENCY LIGHTS | |
| ER004 COMMUNICATION SYSTEM | | | | |
| BLPH-VHF | VHF MARINE PORTABLE RADIOS | ER004 | ER004-BLPH-VHF | |
| BLPH-SART | SART (Safety And Rescue Transponder) | ER004 | ER004-BLPH-SART | |
| BLPH-EPIRB | EPIRB (Emergency Position Indicating Radio Beacon) | ER004 | ER004-BLPH-EPIRB | |
| ER005 UNINTERRUPTED POWER SUPPLY | | | | |
| BLPH-AC UPS B-300 | AC UPS SYSTEM B-300 | ER005 | ER005-BLPH-AC UPS B-300 | |
| BLPH-DC UPS | DC UPS SYSTEM | ER005 | ER005-BLPH-DC UPS | |
| LS001 PERSONAL SURVIVAL EQUIPMENT | | | | |
| BLPH - SAFETY CABINET | SAFETY CABINET (WITH IMMERSION SUIT, LIFE JACKET) | LS001 | LS001 -BLPH - SAFETY CABINET | |
| BLPH - FIRST AID KIT | FIRST AID KIT | LS001 | LS001 -BLPH - FIRST AID KIT | |

| SCE TAG | DESCRIPTION | SCE GROUP | CODE | NOTE |
|---|---|---|---|---|
| BLPH - RESUSCITATION UNIT | RESUSCITATION UNIT | LS001 | LS001 -BLPH - RESUSCITATION UNIT | |
| BLPH - ESCAPE MASK | ESCAPE MASK | LS001 | LS001 -BLPH - ESCAPE MASK | |
| BLPH - EVACUATION STRETCHER | EVACUATION STRETCHER | LS001 | LS001 -BLPH - EVACUATION STRETCHER | |
| BLPH - LIFEBUOY | LIFEBUOY | LS001 | LS001 -BLPH - LIFEBUOY | |
| LS002 ALTERNATE MEANS OF ESCAPE (LIFERAFT) | | | | |
| BLPH - LIFERAFT | LIFERAFT | LS002 | LS002 -BLPH - LIFERAFT | |

# ATTACHMENT 2 – PERFORMANCE STANDARDS CARDS

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# SI001: SUBSEA STRUCTURES

| SCE PERFORMANCE STANDARD | SUBSEA STRUCTURES | | Revision 00 |
|---|---|---|---|
| SCE Group | Subsea Structures | SCE ID: | SI001 |
| SCE Boundaries | Platform structural elements:<br>- Subsea/ substructure | Performance Standard Owner | HSE /CIVIL |
| SCE Goal | Ensure integrity of platform structures | Interdependence | -SI002: Topside structures<br>-PS015: Navigation aids (to avoid structure damage) |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| Substructure<br>Ensure platform structural integrity through the design life of the facility | Mechanical integrity | - General visual inspection on substructure (above water part) | • External Visual Inspection, including marine growth, defects | 1 Year | EN ISO 19901-9 Petroleum and natural gas industries – Specific requirements for offshore structures – Part 9: Structural integrity management |
| | | - General visual inspection on substructure (above and underwater part) | • External Visual Inspection, including marine growth, defects<br>• Non Destructive Test on main critical elements (wall, weld, joints)[1] | 5 Years [2] | EN ISO 17640:2017 Non-destructive testing of welds – Ultrasonic Testing – Techniques, Testing Levels and Assessment |

[1] NDE is performed only when triggered by visual inspection findings or specific event, while it will not be done on fixed time intervals.

[2] Any SCE task with a frequency that is higher than 2 years, will not be executed during the 2 years demonstration period but it is still valid and will be recorded on this document in case operation period is extended.

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| **External coating**<br>Ensure protection toward external agents and prevent corrosion during normal operation through the design life of the facility | Coating integrity | - External Visual Inspection | • External Visual Inspection<br>• Check any damage | 1 Year | |

| Reliability |
|---|
| Not applicable |
| **Survivability** |
| Structures need to survive major accidents and extreme weather (e.g. extreme storms, seismic) within its design requirements. |

# SI002: TOPSIDE STRUCTURES

| SCE PERFORMANCE STANDARD | TOPSIDE STRUCTURES | | Revision 00 |
|---|---|---|---|
| SCE Group | Topside Structures | SCE ID: | SI002 |
| SCE Boundaries | Platform structural elements:<br>- Topside structure | Performance Standard Owner | HSE /CIVIL |
| SCE Goal | Ensure integrity of platform structures | Interdependence | -SI001: Subsea structures<br>-PS015: Navigation aids (to avoid structure damage)<br>-ER002: Escape routes (since topside structure can be used) |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| **Topside structure**<br>Ensure platform structural integrity through the design life of the facility | Mechanical integrity | - General visual inspection on topside structure (elements / connections of bridge/deck/ flare, jacket/ deck connections, handling systems) | • External Visual Inspection | 1 Year | EN ISO 19901-9 Petroleum and natural gas industries – Specific requirements for offshore structures – Part 9: Structural integrity management |
| | | - Close visual inspection on topside structure (elements / connections of bridge/deck / flare, jacket/deck connections, | • External Visual Inspection<br>• Non Destructive Test on main critical elements[3] | 4-5 Year [4] | EN ISO 17640:2017 Non-destructive testing of welds – Ultrasonic Testing – Techniques, Testing Levels |

[3] NDE is performed only when triggered by visual inspection findings or specific event, while it will not be done on fixed time intervals.

[4] Any SCE task with a frequency that is higher than 2 years, will not be executed during the 2 years demonstration period but it is still valid and will be recorded on this document in case operation period is extended.

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| | | handling systems) | | | and Assessment |
| **External coating**<br>Ensure protection toward external agents and prevent corrosion during normal operation through the design life of the facility | Coating integrity | - External Visual Inspection | • External Visual Inspection<br>• Check any damage | 1 Year | |

| Reliability |
|---|
| Not applicable |
| **Survivability** |
| Structures need to survive major accidents and extreme weather (e.g. extreme storms, seismic) within its design requirements. |

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# PC001 PRESSURE VESSEL

| SCE PERFORMANCE STANDARD | PRESSURE VESSELS | | Revision 00 |
|---|---|---|---|
| SCE Description | Pressure Vessels | SCE ID: | PC001 |
| SCE Boundaries | Pressure Vessels | Performance Standard Owner | HSE /Process / Mechanical / Piping |
| SCE Goal | Ensure containment of gas during normal operation through the design life of the facility | Interdependence | -PC007: Relief system (to protect equipment in overpressure case)<br>-DS001: Detection system (to detect any leak)<br>-PS002: Fire and explosion protection system<br>-SD001/SD002/SD006: Shutdown system (to isolate and depressurize the equipment in leak case) |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| **Vessels**<br>Ensure containment of gas during normal operation through the design life of the facility | Wall and weld Thickness | - External Visual Inspection<br>- Welded joint condition<br>- Corrosion under insulation<br>- Wall thickness measurements<br>- Leak test (where appropriate) | • External Visual Inspection<br>• Check any leakage | 6 Months | API RP 572: Inspection of Pressure Vessels<br>API 510: Pressure Vessel Inspection Code: In-service Inspection, Rating, Repair, and Alteration. |
| | | | • UT Inspection for Wall thickness measurements | 3 Years or Turnaround [5] | |

[5] Any SCE task with a frequency that is higher than 2 years, will not be executed during the 2 years demonstration period but it is still valid and will be recorded on this document in case operation period is extended.

| Reliability |
|---|
| Not applicable |
| **Survivability** |
| Not applicable |

# PC005 PIPING SYSTEM

| SCE PERFORMANCE STANDARD | PIPING SYSTEM | Revision 00 |
|---|---|---|

| | | | |
|---|---|---|---|
| SCE Description | Piping system | SCE ID: | PC002 |
| SCE Boundaries | Piping system | Performance Standard Owner | HSE /Process / Mechanical / Piping |
| SCE Goal | Ensure containment of gas during normal operation through the design life of the facility | Interdependence | -PC007: Relief system (to protect equipment in overpressure case)<br>-DS001: Detection system (to detect any leak)<br>-PS002: Fire and explosion protection system<br>-SD001/SD002/SD006: Shutdown system (to isolate and depressurize the equipment in leak case) |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| Piping system<br>Ensure containment of gas during normal operation of the facility | Line Thickness | - External Visual Inspection<br>- Welded joint condition<br>- Corrosion under insulation<br>- Wall thickness measurements<br>- Leak test (where appropriate) | • External Visual Inspection<br>• Check any leakage | 6 Months | API 574 : Inspection Practices for Piping System Components<br>API 570: Piping Inspection Code: In-Service Inspection, Rating, Repair, And Alteration of Piping Systems |
| | | | • Wall thickness measurements<br>• Leak test (where appropriate) | 5-10 Year (as per piping class) [6] | |

[6] Any SCE task with a frequency that is higher than 2 years, will not be executed during the 2 years demonstration period but it is still valid and will be recorded on this document in case operation period is extended.

| Reliability |
|---|
| Not applicable |
| **Survivability** |
| Not applicable |

# PC007 RELIEF SYSTEM

| SCE PERFORMANCE STANDARD | RELIEF SYSTEM | | Revision 00 |
|---|---|---|---|
| SCE Description | Relief system | SCE ID: | PC007 |
| SCE Boundaries | - Protection systems against overpressure (PSV) | Performance Standard Owner | HSE |
| SCE Goal | To prevent uncontrolled loss of containment under extreme process conditions through service life | Interdependence | -SI002: Structural integrity of topside structures to provide support and impact protection<br>PC001: Pressure vessel process containment<br>PC005: Piping process containment<br>SD002: Blowdown valves |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| PSV<br>To ensure integrity with no leak | No leak from pressure retaining components or joints | • External Visual Inspection<br>• - Check any leakage | • External Visual Inspection<br>• Check any leakage<br>• Check any PSV obstructions | 1 Year | • ISO 4126-1 : Safety devices for protection against excessive pressure – Part 1: Safety valves –<br>• API RP 527 : Seat Tightness of pressure relief valves<br>API RP 576 : Pressure Relieving Device |

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| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| PSV<br>To ensure functionality of protection against overpressure | To test operating characteristics of PSV (set pressure, opening rate) | Pressure and calibration test | Type test to determine:<br>- set pressure = ±3%<br>- Overpressure = less than 10% set pressure or 0.1 bar whichever is the greater;<br>- Reproducibility of valve performance ability to reseat satisfactorily (visual check) absence of chatter, flutter, sticking (visual check)<br>• lift at overpressure = no lower than manufacturer value | 2 Years[7] | • ISO 4126-1 : Safety devices for protection against excessive pressure – Part 1: Safety valves |

| Reliability |
|---|
| Systems should always be available on demand. |
| **Survivability** |
| Not applicable |

[7] Any SCE task with a frequency that is higher than 2 years, will not be executed during the 2 years demonstration period but it is still valid and will be recorded on this document in case operation period is extended.

# IC001 HAZARDOUS AREA VENTILATION

| SCE PERFORMANCE STANDARD | NON-HAZARDOUS AREA VENTILATION | | Revision 00 |
|---|---|---|---|
| **SCE Description** | Hazardous area ventilation | **SCE ID:** | IC001 |
| **SCE Boundaries** | - Ventilation system in hazardous areas | **Performance Standard Owner** | HSE / Electric |
| **SCE Goal** | To prevent the formation of potentially hazardous concentration of flammable and/or toxic gas mixtures in hazardous areas by providing adequate ventilation to dilute, disperse and remove such mixtures to a suitable location. | **Interdependence** | - DS001 Fire and Gas Detection; |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq | [Doc. Ref.] |
|---|---|---|---|---|---|
| **Ventilation system**<br><br>To provide sufficient air ventilation and minimum flow requirement | Ventilation system integrity and functionality | - Visual inspection<br>- Function Test | • External Visual Inspection<br>• No plugging / blockages / obstruction<br>• Fan functionality | 6 months [8] | Electrical equipments for ATEX IEC 60079-17" Inspection and maintenance of electrical installations in hazardous areas (other than mines) |
| | | Ventilation System Air Flow Test | Perform flow test for the HVAC system (according to design specification) | 1 year | Electrical equipments for ATEX IEC 60079-17" Inspection and maintenance of electrical installations in hazardous areas (other than mines) |

[8] The frequency of the test is aligned with the minimum time in which is foreseen the visit from the external crew.

| Reliability |
|---|
| Ventilation should always be in continuous operation. |
| **Survivability** |
| The HVAC system's ability to prevent gas accumulation in are vital during major accident |

# IC002 NON-HAZARDOUS AREA VENTILATION

| SCE PERFORMANCE STANDARD | NON-HAZARDOUS AREA VENTILATION | | Revision 00 |
|---|---|---|---|
| **SCE Description** | Non-hazardous area ventilation | **SCE ID:** | IC002 |
| **SCE Boundaries** | - Ventilation system into non-hazardous areas | **Performance Standard Owner** | HSE / Electric |
| **SCE Goal** | To prevent the formation of potentially hazardous concentration of flammable and/or toxic gas mixtures into non-hazardous areas. | **Interdependence** | - DS001 Fire and Gas Detection; |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq | [Doc. Ref.] |
|---|---|---|---|---|---|
| **Ventilation system**<br><br>To prevent the ingress of flammable gas-air mixtures or life-threatening atmospheres into non-hazardous areas. | Ventilation system integrity and functionality | - Visual inspection<br>- Function Test | • External Visual Inspection<br>• No plugging / blockages / obstruction<br>• Fan functionality<br>• Check ventilation fan stops upon activation of FGS signal | 1 Year | Electrical equipments for ATEX IEC 60079-17" Inspection and maintenance of electrical installations in hazardous areas (other than mines) |
| **Battery extraction fans**<br><br>Prevent the build-up of flammable atmosphere within the battery room. | Ventilation system integrity and functionality | - Visual inspection<br>- Function Test | • External Visual Inspection<br>• Fan functionality | 1 Year | Electrical equipments for ATEX IEC 60079-17" Inspection and maintenance of electrical installations in hazardous areas (other than mines) |

| Reliability |
|---|
| Ventilation should always be in continuous operation. |
| **Survivability** |
| The HVAC system's ability to prevent gas migration to other areas are vital during major accident |

# IC003 CERTIFIED (EX-RATED) ELECTRICAL EQUIPMENT

| SCE PERFORMANCE STANDARD | Certified (Ex-rated) Electrical Equipment | | Revision 00 |
|---|---|---|---|
| SCE Description | Certified (Ex-rated) Electrical Equipment | SCE ID: | IC003 |
| SCE Boundaries | - Electrical equipment<br>- Instrumentation | Performance Standard Owner | HSE / Electric |
| SCE Goal | To prevent risk of ignition by providing control loops certified for corresponding hazardous area<br>To prevent risk of ignition by providing certified electrical equipment for corresponding hazardous area | Interdependence | N/A |

<table>
<tr><th>Functionality Criteria / Availability</th><th>Performance Measure</th><th>Assurance Method</th><th>Instructions [9], [10]</th><th>Freq</th><th>[Doc. Ref.]</th></tr>
<tr><td rowspan="2">Ex-d, Ex-e, Ex-n equipment apparatus:<br><br>No ignition source formation probability inside the concerned hazardous area</td><td>Enclosure, glasses and glass-to-metal sealing gaskets and/or compounds integrity</td><td>Visual inspection<br>Close inspection<br>Detailed inspection</td><td>• Refer to the Attached Table1: Inspection Schedule for Ex "d", Ex "e" and Ex "n" Installations (D = Detailed, C = Close, V = Visual)</td><td><table><tr><th>Type</th><th>Frequency</th></tr><tr><td>V</td><td>6 Months</td></tr><tr><td>C</td><td>Yearly</td></tr><tr><td>D</td><td>3 Years</td></tr></table></td><td rowspan="2">Electrical equipment for ATEX IEC 60079-17” Inspection and maintenance of electrical installations in hazardous areas (other than mines)</td></tr>
<tr><td>Bolts, cable entry devices and blanking elements completeness and tightness</td><td>- Physical check (detailed and close inspection)<br>- Visual check</td><td>• Refer to the Attached Table1: Inspection Schedule for Ex "d", Ex "e" and Ex "n"</td><td><table><tr><th>Type</th><th>Frequency</th></tr><tr><td>V</td><td>6 Months</td></tr><tr><td>C</td><td>Yearly</td></tr><tr><td>D</td><td>3 Years</td></tr></table></td></tr>
</table>

[9] The detailed inspection will not be executed during the 2 years demonstration period but it is still valid and will be recorded on this document in case operation period is extended.
[10] Frequency of visual inspection is aligned with the minimum time interval for which is foreseen the visit from the external crew.

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions [9], [10] | Freq | [Doc. Ref.] |
|---|---|---|---|---|---|
| | | | Installations (D = Detailed, C = Close, V = Visual) | | |
| | Cable gland installation | -Visual inspection<br>-Close inspection<br>-Detailed inspection | • Refer to the Attached Table1: Inspection Schedule for Ex "d", Ex "e" and Ex "n" Installations (D = Detailed, C = Close, V = Visual) | Type / Frequency<br>V / 6 Months<br>C / Yearly<br>D / 3 Years | |
| | Lamp rating, type and position | Detailed inspection | • Refer to the Attached Table1: Inspection Schedule for Ex "d", Ex "e" and Ex "n" Installations (D = Detailed, C = Close, V = Visual) | Type / Frequency<br>V / 6 Months<br>C / Yearly<br>D / 3 Years | |
| | Electrical connections tightness | Detailed inspection | • Refer to the Attached Table1: Inspection Schedule for Ex "d", Ex "e" and Ex "n" Installations (D = Detailed, C = Close, V = Visual) | Type / Frequency<br>V / 6 Months<br>C / Yearly<br>D / 3 Years | |

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| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions [9], [10] | Freq | [Doc. Ref.] |
|---|---|---|---|---|---|
| | No damage to cables | Visual inspection<br>Close inspection<br>Detailed inspection | • Refer to the Attached Table1: Inspection Schedule for Ex "d", Ex "e" and Ex "n" Installations (D = Detailed, C = Close, V = Visual) | Type / Frequency<br>V / 6 Months<br>C / Yearly<br>D / 3 Years | |
| | Sealing of trunking, ducts, pipes and/or conduits | Visual inspection<br>Close inspection<br>Detailed inspection | • Refer to the Attached Table1: Inspection Schedule for Ex "d", Ex "e" and Ex "n" Installations (D = Detailed, C = Close, V = Visual) | Type / Frequency<br>V / 6 Months<br>C / Yearly<br>D / 3 Years | |
| | Earthing connections | - Physical check (detailed and close inspection)<br>- Visual check | • Refer to the Attached Table1: Inspection Schedule for Ex "d", Ex "e" and Ex "n" Installations (D = Detailed, C = Close, V = Visual) | Type / Frequency<br>V / 6 Months<br>C / Yearly<br>D / 3 Years | |
| | Fault loop impedance or Earthing resistance | Detailed inspection | • Refer to the Attached Table1: Inspection Schedule for Ex "d", Ex "e" and Ex "n" Installations (D = Detailed, | Type / Frequency<br>V / 6 Months<br>C / Yearly<br>D / 3 Years | |

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| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions [9], [10] | Freq | [Doc. Ref.] |
|---|---|---|---|---|---|
| | | | C = Close, V = Visual) | | |
| | Insulation resistance | Detailed inspection | • Refer to the Attached Table1: Inspection Schedule for Ex "d", Ex "e" and Ex "n" Installations (D = Detailed, C = Close, V = Visual) | Type / Frequency<br>V / 6 Months<br>C / Yearly<br>D / 3 Years | |
| | Automatic electrical protective devices | Detailed inspection | • Refer to the Attached Table1: Inspection Schedule for Ex "d", Ex "e" and Ex "n" Installations (D = Detailed, C = Close, V = Visual) | Type / Frequency<br>V / 6 Months<br>C / Yearly<br>D / 3 Years | |
| | Protection against corrosion, weather, vibration and other adverse factors | Visual inspection<br>Close inspection<br>Detailed inspection | • Refer to the Attached Table1: Inspection Schedule for Ex "d", Ex "e" and Ex "n" Installations (D = Detailed, C = Close, V = Visual) | Type / Frequency<br>V / 6 Months<br>C / Yearly<br>D / 3 Years | |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions [9], [10] | Freq | [Doc. Ref.] |
|---|---|---|---|---|---|
| Ex-i, equipment apparatus:<br><br>No ignition source formation probability inside the concerned hazardous area | Same measures as above<br>+<br>Safety barrier units, relays with correct installation and safe earthed | Visual inspection<br>Close inspection<br>Detailed inspection | • Refer to the Attached Table2: Inspection Schedule for Ex "i" Installations | Type / Frequency<br>V / 6 Months<br>C / Yearly<br>D / 3 Years | Electrical equipment for ATEX IEC 60079-17" Inspection and maintenance of electrical installations in hazardous areas (other than mines) |
| | Same measures as above<br>+<br>Intrinsically safe circuit isolation from earth | Detailed inspection | • Refer to the Attached Table2: Inspection Schedule for Ex "i" Installations | Type / Frequency<br>V / 6 Months<br>C / Yearly<br>D / 3 Years | |
| | Same measures as above<br>+<br>Separation between Intrinsically and non-intrinsically safe circuit | Detailed inspection | • Refer to the Attached Table2: Inspection Schedule for Ex "i" Installations | Type / Frequency<br>V / 6 Month<br>C / Yearly<br>D / 3 Years | |
| | Protection against corrosion, weather, vibration and other adverse factors | Visual inspection<br>Close inspection<br>Detailed inspection | • Refer to the Attached Table2: Inspection Schedule for Ex "i" Installations | Type / Frequency<br>V / 6 Months<br>C / Yearly<br>D / 3 Years | |
| | No dust and dirt accumulation | Visual inspection<br>Close inspection | • Refer to the Attached Table2: Inspection Schedule for | Type / Frequency<br>V / 6 Months<br>C / Yearly<br>D / 3 Years | |

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| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions [9], [10] | Freq | [Doc. Ref.] |
|---|---|---|---|---|---|
| | | Detailed inspection | Ex "i" Installations | | |

| Reliability |
|---|
| Not applicable |
| **Survivability** |
| Not applicable |

Table 1 Inspection Schedule for Ex "d", Ex "e" and Ex "n" Installations (D = Detailed, C = Close, V = Visual)

| Check that: | | Ex "d" | | | Ex "e" | | | Ex "n" | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Grade of Inspection | | | | | | | | |
| | | D | C | V | D | C | V | D | C | V |
| A | APPARATUS | | | | | | | | | |
| 1 | Apparatus is appropriate to area classification | * | * | * | * | * | * | * | * | * |
| 2 | Apparatus group is correct | * | * | | * | * | | * | * | |
| 3 | Apparatus temperature class is correct | * | * | | * | * | | * | * | |
| 4 | Apparatus circuit identification is correct | * | | | * | | | * | | |
| 5 | Apparatus circuit identification is available | * | * | * | * | * | * | * | * | * |
| 6 | Enclosure, glasses and glass-to-metal sealing gaskets and/or compounds are satisfactory | * | * | * | * | * | * | * | * | * |
| 7 | There are no unauthorized modifications | * | | | * | | | * | | |
| 8 | There are no visible unauthorized modifications | | * | * | | * | * | | * | * |
| 9 | Bolts, cable entry devices (direct and indirect) and blanking elements are of the correct type and are complete and tight | | | | | | | | | |
| | – physical check | * | * | | * | * | | * | * | |
| | – visual check | | | * | | | * | | | * |
| 10 | Cable Glands installed are appropriate for the area classification | * | * | * | * | * | * | * | * | * |
| 11 | Cable Gland installation is appropriate and correct | * | * | * | * | * | * | * | * | * |
| 12 | Flange faces are clean and undamaged and gaskets, if any, are satisfactory | * | | | | | | | | |
| 13 | Flange gap dimensions are within maximal values permitted | * | * | | | | | | | |
| 14 | Lamp rating, type and position are correct | * | | | * | | | * | | |
| 15 | Electrical connections are tight | | | | * | | | * | | |
| 16 | Condition of enclosure gaskets is satisfactory | | | | * | | | * | | |
| 17 | Enclosed – break and hermetically sealed devices are undamaged | | | | | | | * | | |
| 18 | Restricted breathing enclosure is satisfactory | | | | | | | * | | |
| 19 | Motor fans have sufficient clearance to enclosure and/or covers | * | | | * | | | * | | |
| 20 | Breathing and draining devices are satisfactory | * | * | | * | * | | * | * | |
| B | INSTALLATION | | | | | | | | | |
| 1 | Type of cable is appropriate | * | | | * | | | * | | |
| 2 | There is no obvious damage to cables | * | * | * | * | * | * | * | * | * |
| 3 | Sealing of trunking, ducts, pipes and/or conduits is satisfactory | * | * | * | * | * | * | * | * | * |
| 4 | Stopper boxes and cable boxes are correctly filled | * | | | | | | | | |
| 5 | Integrity of conduit system and interface with mixed system is maintained | * | | | * | | | * | | |

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| Check that: | | Ex "d" | | | Ex "e" | | | Ex "n" | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Grade of Inspection | | | | | | | | |
| | | D | C | V | D | C | V | D | C | V |
| 6 | Earthing connections, including any supplementary Earthing bonding connections are satisfactory (for Example connections are tight and conductors are of sufficient cross-section) | | | | | | | | | |
| | – physical check | * | | | * | | | * | | |
| | – visual check | | * | * | | * | * | | * | * |
| 7 | Fault loop impedance (TN systems) or Earthing resistance (IT systems) is satisfactory * Fault loop impedance will not be done on live hydrocarbon plants | * | | | * | | | * | | |
| 8 | Insulation resistance is satisfactory | * | | | * | | | * | | |
| 9 | Automatic electrical protective devices operate within permitted limits | * | | | * | | | * | | |
| 10 | Automatic electrical protective devices are set correctly (auto-reset not possible in zone 1) | * | | | * | | | * | | |
| 11 | Special conditions of use (if applicable) are complied with | * | | | * | | | * | | |
| 12 | Cables not in use are correctly terminated | * | | | * | | | * | | |
| 13 | Obstructions adjacent to flameproof flanged joints are in accordance with IEC 60079-14 | * | * | * | | | | | | |
| 14 | Variable voltage/frequency installation in accordance with documentation | * | * | | * | * | | * | * | |
| C | ENVIRONMENT | | | | | | | | | |
| 1 | Apparatus is adequately protected against corrosion, weather, vibration and other adverse factors | * | * | * | * | * | * | * | * | * |
| 2 | No undue accumulation of dust and dirt | * | * | * | * | * | * | * | * | * |
| 3 | Electrical insulation is clean and dry | | | | * | | | * | | |

Notes:

(1) General: the checks used for apparatus using both types of protection "e" and "d" will be a combination of both columns.

(2) Items B7 and B8: account should be taken of the possibility of an Explosive atmosphere in the vicinity of the apparatus when using electrical test equipment.

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Table 2 Inspection Schedule for Ex 'I' Installations (D=detailed, C=Close, V=Visual)

| Check that: | | Grade of inspection | | |
|---|---|---|---|---|
| | | D | C | V |
| A | EQUIPMENT | | | |
| 1 | Circuit and/or equipment documentation is appropriate to area classification | X | X | X |
| 2 | Equipment installed is that specified in the documentation | X | X | |
| 3 | Circuit and/or equipment category and group correct | X | X | |
| 4 | IP rating of equipment is appropriate to the group III material present | X | X | |
| 5 | Equipment temperature class is correct | X | X | |
| 6 | Ambient temperature range of the apparatus is correct for the installation | X | X | |
| 7 | Service temperature range of the apparatus is correct for the installation | X | X | |
| 8 | Installation is clearly labelled | X | X | |
| 9 | Enclosure, glass parts and glass-to-metal sealing gaskets and/or compounds are satisfactory | X | X | |
| 10 | Cable glands and blanking elements are the correct type, complete and tight – physical and visual check | X | X | X |
| 11 | There are no unauthorised modifications | X | | |
| 12 | There is no evidence of unauthorised modifications | | X | X |
| 13 | Diode safety barriers, galvanic isolators, relays and other energy limiting devices are of the approved type, installed in accordance with the certification requirements and securely earthed where required | X | X | X |
| 14 | Conditions of enclosure gaskets is satisfactory | X | | |
| 15 | Electrical connections are tight | X | | |
| 16 | Printed circuit boards are clean and undamaged | X | | |
| 17 | The maximum voltage Um of the associated apparatus is not exceeded | X | X | |
| B | INSTALLATION | | | |
| 1 | Cables are installed in accordance with the documentation | X | | |
| 2 | Cables screens are earthed in accordance with the documentation | X | | |
| 3 | There is no obvious damage to cables | X | X | x |
| 4 | Sealing of trunking, ducts, pipes and/or conduits is satisfactory | X | X | X |
| 5 | Point-to-point connections are all correct (initial inspection only) | X | | |
| 6 | Earth continuity is satisfactory (e.g. connections are tight and conductors are of sufficient cross-section) for non-galvanically isolated circuits | X | | |
| 7 | Earth connections maintain the integrity of the type of protection | X | X | X |
| 8 | The intrinsically safe circuit earthing is satisfactory | X | | |
| 9 | Insulation resistance is satisfactory | X | | |

| Check that: | | Grade of inspection | | |
|---|---|---|---|---|
| | | D | C | V |
| 10 | Separation is maintained between intrinsically safe and non-intrinsically safe circuits in common distribution boxes or relay cubicles | X | | |
| 11 | Short-circuit protection of the power supply is in accordance with the documentation | X | | |
| 12 | Special conditions of use (if applicable) are complied with | X | | |
| 13 | Cables not in use correctly terminated | X | | |
| C | ENVIRONMENT | | | |
| 1 | Equipment is adequately protected against corrosion, weather, vibration and other adverse factors | X | X | X |
| 2 | No undue accumulation of dust and dirt | X | X | X |

# IC005 ELECTRICAL EARTHING CONTINUITY AND EARTH BONDING

| SCE PERFORMANCE STANDARD | Electrical earthing continuity and earth bonding | | Revision 00 |
|---|---|---|---|
| **SCE Description** | Electrical earthing continuity and earth bonding | **SCE ID:** | IC005 |
| **SCE Boundaries** | - Lightning protection system | **Performance Standard Owner** | HSE / Electric |
| **SCE Goal** | To minimise the likelihood of ignition from lightning and static discharge in hazardous areas | **Interdependence** | - IC003 Certified electrical equipment |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq | [Doc. Ref.] |
|---|---|---|---|---|---|
| **Lightning protection system**<br>The condition of the earthing and lightning protection system installation is suitable for operations in all areas. | Lightning protection system integrity | - Visual inspection | • External Visual Inspection, looking for sign of damage, loose fixing & fitting and corrosion, including cables general status | 1 Year | IEC 60079 Electrical Apparatus for Explosive Atmospheres Part 17- Inspection and Maintenance of Electrical Installations in Hazardous Areas requirements |
| **Earthing continuity for structure, piping and equipment**<br>The electric continuity between metallic elements is required | Electrical continuity system integrity | - Visual inspection | • External Visual Inspection<br>• Hearting resistance measurement | 2 Years | IEC 60079 Electrical Apparatus for Explosive Atmospheres Part 17- Inspection and Maintenance of Electrical Installations in Hazardous Areas requirements |

| Reliability |
|---|
| Electrical earthing system should always be available at all times. |
| **Survivability** |
| Not applicable |

# IC007 INERT GAS BLANKET SYSTEM

| SCE PERFORMANCE STANDARD | Electrical earthing continuity and earth bonding | | Revision 00 |
|---|---|---|---|
| **SCE Description** | Inert gas blanket system | **SCE ID:** | IC007 |
| **SCE Boundaries** | - Nitrogen blanketing for Hydrogen vent system | **Performance Standard Owner** | HSE / Process / Instrumentation |
| **SCE Goal** | To provide an inert atmosphere within enclosed process systems in order to prevent the ignition of flammable inventory. | **Interdependence** | - PC007 Relief system<br>- SD002 BDV<br>- SD009 Utility air<br>- DS001 F&G detection |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq | [Doc. Ref.] |
|---|---|---|---|---|---|
| **Inert gas availability**<br>Provide nitrogen gas at sufficient pressure and correct concentration to enclosed process systems. | No leak from flanges and connections,<br>Integrity check of instrument air piping system | - External Visual Inspection<br>- Leak test (where appropriate) | • External Visual Inspection<br>Check any leakage | 1 Year | • For leak test, API 598 Valve Inspection and Testing"<br>• API 574 : Inspection Practices for Piping System Components |
| | Correct nitrogen purity | Online Oxygen analyzer measurement is precise and accurate | • To perform calibration for online oxygen analyzers | 1 Year[11] | IEC 61508 : Functional safety of electrical safety-related systems – Part 2 |
| **Pressure Transmitter functionality** | Internal diagnostic system to monitor | Simulate readings discrepancy inside the | • Verify the activation of alarm in case | 1 Year | IEC 61508 : Functional safety of electrical |

[11] Frequency may vary depending on the equipment type; refer to vendor's manuals.

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq | [Doc. Ref.] |
|---|---|---|---|---|---|
| Low pressure alarm functionality | discrepancy between measures. | Transmitter calibrated range.<br>Verify the activation of alarm in case of revealed discrepancy. | of revealed discrepancy | | safety-related systems – Part 2 |

| Reliability |
|---|
| System should always be available at all times. |
| **Survivability** |
| Not applicable |

# DS001 FIRE AND GAS DETECTION

| SCE PERFORMANCE STANDARD | FIRE AND GAS DETECTION | | Revision 00 |
|---|---|---|---|
| SCE Description | F&G Detection System | SCE ID: | DS001 |
| SCE Boundaries | Fire and gas detection system on platform<br>• H2 detector<br>• Flame detector<br>• Manual Fire Alarms<br>• Beacons and Sounders | Performance Standard Owner | HSE / Instrumentation |
| SCE Goal | To ensure gas / flame detection in case of fire and to ensure initiation of relevant automatic actions | Interdependence | -SD001/SD002/SD006: Shutdown system (ESD initiated by F&G system)<br>-ER005:UPS (back-up for F&G system)<br>-IC003: Certified (Ex rated) Electrical Equipment -ER2: Communication system<br>-ER001: Muster Area<br>-ER004: Emergency Communication |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| Flame /smoke Detector Functionality.<br>To ensure the prompt detection of a fire | - Early detection of fire | Detectors are clean and in good condition. | • External Visual Inspection | 6 Months | API RP 14G - Recommended Practice for Fire Prevention and Control on Fixed Open-type Offshore Production Platforms |
| Gas Detector Functionality. | - Early detection of gas release | Detectors are clean and in | • External Visual Inspection | 6 Months | API RP 14G - Recommended Practice for |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| To ensure the prompt detection of $H_2$ gas release | | good condition. | | | Fire Prevention and Control on Fixed Open-type Offshore Production Platforms<br>Vendor Manual |
| | | As specified in the C&E matrices gas detectors initiate alarms at the correct LEL setpoints | • Functional and calibration test[12] | 1 Year | |
| **F&G logic Functionality.–**<br>To ensure the prompt alarm signalling of a fire or gas release | Logic Solver Functionality.<br>- Initiation of the relevant automatic actions (ESD & depressurization) via voting logic | To perform test on system SIS for F&G | • Check detector status for fault or alarm | 6 Months | IEC 61508 : Functional safety of electrical safety-related systems – Part 2<br>API RP 14G - Recommended Practice for Fire Prevention and Control on Fixed Open-type Offshore Production Platforms |
| | | | • Perform function test | 1 Year | |
| **Manual alarms**<br>To provide means for personnel to manually alert of an event and its location. | Manual alarm functionality | MAC within specification, unobstructed, clean and in good working condition.<br>MAC actions are as per the cause and effect matrices | • External Visual Inspection<br>• Functional test (on sample) | 1 Year | IEC 61508 : Functional safety of electrical safety-related systems – Part 2 |

[12] Details about functional and calibration test should be checked on sensor's vendor manual.

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| Visible / audible alarms | Audible alarm detection<br>Flashing beacon visibility. | Beacons are visible and local sounder is audible on initiation. | • Beacon and sounders function test | 1 Year | IEC 61508 : Functional safety of electrical safety-related systems – Part 2 |

| Reliability |
|---|
| systems should always be available at all time. |
| **Survivability** |
| • Fire detectors response time should activate and initiate executive actions before direct exposure destroys detector or cabling.<br>• Cables shall be fire resistant type. Cabling to be routed to reduce the risk of loss of detection functionality in the event of a reasonably likely fire or explosion route to avoid fire zone areas.<br>• Marshalling and System cabinets shall be in a protected area outside process area fire zones. |

# PS002 FIRE AND EXPLOSION PROTECTION

| SCE PERFORMANCE STANDARD | FIRE AND EXPLOSION PROTECTION | | Revision 00 |
|---|---|---|---|
| SCE Description | Fire and explosion protection | SCE ID: | PS002 |
| SCE Boundaries | • Deck plating<br>• Fire extinguisher | Performance Standard Owner | HSE / Mechanical |
| SCE Goal | To protect personnel and SCEs from explosion effects by way of shielding | Interdependence | SI002: Topside structures<br>PC001: pressure vessel<br>PC006: piping system |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| **Deck plating.**<br>To ensure mechanical protection | Mechanical integrity | Protection systems are in good working condition. | • External Visual Inspection | 1 Year | - |
| **Fire extinguishers**<br>To ensure proper activation of extinguisher in fire case | *System integrity and functionality* | • External Visual Inspection<br>• Extinguisher functionality | • to perform general visual inspection of portable extinguishers and any relevant accessory equipment, such as trolley, storage box, and conditions of hoses, nozzles and valves | 6 Month | API 14G - Recommended Practice for Fire Prevention and Control on Fixed Open-type Offshore Production Platforms<br>NFPA 10 - Standard for Portable Fire Extinguishers |
| | | | • to perform discharge test and agent sample analysis, gas cartridge test, with check of | 1 year | |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| | | | powder agent condition. | | |
| | | | • To perform Hydrostatic test | 5 Years | |

| Reliability |
|---|
| Systems should always be available at all time. |
| **Survivability** |
| To maintain integrity of areas intended to be protected |

# PS015 COLLISION AVOIDANCE SYSTEM

| SCE PERFORMANCE STANDARD | COLLISION AVOIDANCE SYSTEM | | Revision 00 |
|---|---|---|---|
| SCE Description | Collision avoidance system | SCE ID: | PS015 |
| SCE Boundaries | Collision avoidance systems:<br>• Radar transponding beacon<br>• Visual navigation aids<br>• Marine acoustic aids | Performance Standard Owner | HSE / Instrument |
| SCE Goal | To alert marine vessels of the position of the installation, taking enough time to avoid the area and preventing any collision | Interdependence | -SI001: Subsea structures<br>-SI002: Topside structures<br>-ER002: Escape routes (since topside structure can be used |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| **Flashing/ Fixed light**<br>To provide visible indication / warning of the presence of the installation to aircraft & marine vessels | System functionality and integrity | White/Red flashing light inspection and functionality<br>Red fixed light inspection and functionality | • External Visual Inspection<br>• Check light intensity<br>• Check flash light functionality to exhibit Morse letter "U" | 6 Months | IALA standards,<br>CAP 437 Standards for Offshore Helicopter Landing Areas |
| **Nav aid back-up batteries**<br>To provide electrical power in case of main power supply loss | Batteries availability and functionality | Power connections and switchgear<br>Electrical test of Battery | • Verify protections, load measure / signalling and pilot lamps test (if applicable)<br>• Check mechanical integrity of board structures | 1 Year | IEC 62040-3:2021 -<br>Uninterruptible power systems (UPS) - Part 3: Method of specifying the performance and test requirements |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| | | | • Measure and load voltage and current on circuit breakers (if applicable)<br>• Check all electrical terminations are firmly secured and free from overheating and corrosion | | |

| Reliability |
|---|
| Systems should always be available at all time. |
| **Survivability** |
| There shall always be a means of communication in case of ship collision event. |

# SD001 EMERGENCY SHUTDOWN SYSTEM (ESD)

| SCE PERFORMANCE STANDARD | EMERGENCY SHUTDOWN SYSTEM (ESD) | | Revision 00 |
|---|---|---|---|
| SCE Description | Emergency shutdown system (ESD) | SCE ID: | SD001 |
| SCE Boundaries | Safety control loop including the transmitter with sensor for parameter (pressure, temperature, level), and logic solver (interlock, analogical or digital input/output modules, interposing relay, pulse barrier) | Performance Standard Owner | HSE / Instrumentation |
| SCE Goal | To ensure platform shutdown in safe conditions | Interdependence | -IC003: Ignition control (to preserve integrity of Ex rated equipment in ESD system)<br>-DS001: Detection system (ESD initiated by F&G system)<br>-ER005:UPS (back-up for F&G system)<br>-ER001: Muster Area<br>-ER004:Emergency Communication |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| **Transmitter signal**<br>SIF functionality | Internal diagnostic system to monitor discrepancy between measures. | Simulate readings discrepancy inside the Transmitter calibrated range.<br>Verify the activation of alarm in case of revealed discrepancy. | • Verify the activation of alarm in case of revealed discrepancy | 1 Year | • IEC 61508 : Functional safety of electrical safety-related systems – Part 2 |

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| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| **Logic Solver** functionality | Loop check for alarm threshold, voting operation, outputs, alarms and indications. | Simulate readings discrepancy inside the software (Software module testing) | • Loop check | 1 Year | • IEC 61508 : Functional safety of electrical safety-related systems – Part 2 |

| Reliability |
|---|
| Systems should always be available on demand. |
| **Survivability** |
| Equipment that are critical for the effectuation of system actions, shall be protected against mechanical damage and an Major Hazard scenario until shutdown sequence is complete. |

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# SD002 BLOWDOWN VALVES (BDV)

| SCE PERFORMANCE STANDARD | BLOWDOWN VALVES (BDV) | | Revision 00 |
|---|---|---|---|
| SCE Description | Blowdown Valves (BDV) | SCE ID: | SD002 |
| SCE Boundaries | Blowdown Valves | Performance Standard Owner | HSE / Instrumentation |
| SCE Goal | To prevent escalation during a major accident event ensuring a rapid reduction in the size of inventory. | Interdependence | -DS001: Detection system (ESD initiated by F&G system)<br>-PC001 Pressure Vessels;<br>-PC005 Piping Systems;<br>- SD001 Emergency Shutdown (ESD) Control System. |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| **BDV integrity**<br>Ensure containment of gas | No leak from flanges and connections,<br>Integrity check of actuator, position indicator switches and end stops | - External Visual Inspection<br>- Leak test (where appropriate) | • External Visual Inspection<br>• Check any leakage | 1 Year | • For leak test, API 598 Valve Inspection and Testing" |
| **BDV functionality**<br>To ensure safe closure/opening in case of ESD activation<br>To act the depressurization of platform, after receiving | Internal diagnostic system to monitor discrepancy between measures to ensure safe position | Functional test (partial stroke) | • Functional test to measure stroke travel time and actuation delay | 6 Months | • IEC 61508 : Functional safety of electrical safety-related systems – Part 2 |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| signal from logic solver | Valve Functionality – diagnostic to ensure safe position (FO) | Functional test (full stroke) | • Functional test to be performed to ensure the minimum emergency depressurization requirement | 1 Year | • IEC 61508 : Functional safety of electrical safety-related systems – Part 2 |

| Reliability |
|---|
| Systems should always be available on demand. |
| **Survivability** |
| Equipment that are critical for the effectuation of system actions, shall be protected against mechanical damage and an Major Hazard scenario until shutdown sequence is complete. |

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# SD006 EMERGENCY SHUTDOWN VALVES (SDV)

| SCE PERFORMANCE STANDARD | EMERGENCY SHUTDOWN VALVES (SDV) | | Revision 00 |
|---|---|---|---|
| SCE Description | Emergency Shutdown Valves (SDV) | SCE ID: | SD002 |
| SCE Boundaries | Emergency Shutdown Valves | Performance Standard Owner | HSE / Instrumentation |
| SCE Goal | To ensure platform shutdown in safe conditions | Interdependence | -DS001: Detection system (ESD initiated by F&G system)<br>-PC001 Pressure Vessels;<br>-PC005 Piping Systems;<br>- SD001 Emergency Shutdown (ESD) Control System. |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| SDV integrity<br>Ensure containment of gas | No leak from flanges and connections,<br>Integrity check of actuator, position indicator switches and end stops | - External Visual Inspection<br>- Leak test (where appropriate) | • External Visual Inspection<br>• Check any leakage | 1 Year | • For leak test, API 598 Valve Inspection and Testing" |
| SDV functionality<br>To ensure safe closure/opening in case of ESD activation<br><br>To ensure safe shutdown, after receiving signal from logic solver | Internal diagnostic system to monitor discrepancy between measures to ensure safe position | Functional test (partial stroke) | • Functional test to measure stroke travel time and actuation delay | 6 Months | • IEC 61508: Functional safety of electrical safety-related systems – Part 2 |
| | Valve Functionality – diagnostic to | Functional test (full stroke) | • Functional test to measure stroke | 1 Year | • IEC 61508: Functional safety of |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| | ensure safe position (FC) | | travel time and actuation delay | | electrical safety-related systems – Part 2 |

| Reliability |
|---|
| Systems should always be available on demand. |
| **Survivability** |
| Equipment that are critical for the effectuation of system actions, shall be protected against mechanical damage and an Major Hazard scenario until shutdown sequence is complete. |

# SD009 UTILITY AIR

| SCE PERFORMANCE STANDARD | UTILITY AIR | | Revision 00 |
|---|---|---|---|
| SCE Description | Utility Air | SCE ID: | SD009 |
| SCE Boundaries | Instrument air | Performance Standard Owner | HSE / Mechanical |
| SCE Goal | To prevent an unplanned and / or out-of-sequence operation of safety critical air-controlled equipment, such as emergency shutdown valves. | Interdependence | - SD001 Emergency Shutdown (ESD) Control System.<br>- IC007 Inert gas blanket system |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| **Instrument Air availability**<br>To provide a continuous supply of instrument air at a suitable pressure. | No leak from flanges and connections,<br>Integrity check of instrument air piping system | - External Visual Inspection<br>- Leak test (where appropriate) | • External Visual Inspection<br>• Check any leakage | 1 Year | • For leak test, API 598 Valve Inspection and Testing"<br>• API 574 : Inspection Practices for Piping System Components |
| | Correct functionality of compressor / driver | - Inspection and maintenance | • Compressor / driver periodic maintenance | 1 Year[13] | • Vendor's maintenance manual |
| **Moisture and Pressure Transmitter functionality**<br>Low pressure / high moisture | Internal diagnostic system to monitor discrepancy | Simulate readings discrepancy inside the Transmitter | • Verify the activation of alarm in case of revealed discrepancy | 1 Year | • IEC 61508 : Functional safety of electrical safety-related |

[13] Frequency may vary depending on the equipment type; refer to vendor's manuals.

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| alarm functionality | between measures. | calibrated range.<br>Verify the activation of alarm in case of revealed discrepancy. | | | systems – Part 2 |

| Reliability |
|---|
| Systems should always be available at all times. |
| **Survivability** |
| Not available |

# ER001 MUSTER AREA

| SCE PERFORMANCE STANDARD | MUSTER AREA | | Revision 00 |
|---|---|---|---|
| SCE Description | Muster area | SCE ID: | ER001 |
| SCE Boundaries | Escape evacuation | Performance Standard Owner | HSE |
| SCE Goal | To ensure the emergency to be assessed and to allow the appropriate parts of the emergency response plan to be executed during a Major Accident Event | Interdependence | -SI001: Subsea structures<br>-SI002: Topside structures<br>-SD001: Emergency Shutdown (ESD) System;<br>-ER002: Escape Routes;<br>-ER004:Emergency Communication. |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| **Muster point availability**<br>To ensure safe evacuation and rescue inside the site | Muster point availability | Muster areas are to be free from obstructions to allow personnel to prepare for evacuation. | • Visual check on Muster Area | 1 Year | OSHA 1910.37 - Maintenance, safeguards, and operational features for exit routes. |

| Reliability |
|---|
| Systems should always be available during operations. |
| **Survivability** |
| The muster area shall be located to ensure safe abandonment of the installation during a major hazard scenario |

# ER002 ESCAPE ROUTES

| SCE PERFORMANCE STANDARD | ESCAPE ROUTES | | Revision 00 |
|---|---|---|---|
| SCE Description | Escape routes | SCE ID: | ER002 |
| SCE Boundaries | Escape routes | Performance Standard Owner | HSE |
| SCE Goal | To provide sufficient safe and readily identifiable escape routes for all personnel to leave an area affected by an incident, reach the muster area from any part of the platform and transfer from the muster area to the evacuation and embarkation points | Interdependence | -SI001: Subsea structures<br>-SI002: Topside structures<br>-SD001: Emergency Shutdown (ESD) System;<br>-ER001: Muster Area;<br>-ER003: Emergency Lighting<br>-ER004:Emergency Communication. |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| Escape routes availability<br>To ensure safe escape ways from the platform | Escape routes availability and usable by all personnel including passage for a stretcher. | Clear marking and exit signs<br>All evacuation routes are to be free from obstructions and has adequate width and height clearance | • Check clear marking and exit signs | 1 Year | NFPA 101: Life safety code<br>OSHA 1910.37 - Maintenance, safeguards, and operational features for exit routes. |
| | | | • Check escape route free of obstacles | 6 Months | |

| Reliability |
|---|
| Escape routes should always be available at all times. |
| Survivability |

Ther shall be one escape route available during a major hazard scenario to allow emergency escape and evacuation

# ER003 EMERGENCY / ESCAPE LIGHTING

| SCE PERFORMANCE STANDARD | ESCAPE ROUTES | Revision 00 |
|---|---|---|

| | | | |
|---|---|---|---|
| SCE Description | Emergency / Escape Lighting | SCE ID: | ER003 |
| SCE Boundaries | Emergency Lighting | Performance Standard Owner | HSE / Electrical |
| SCE Goal | To provide adequate illumination at emergency response locations and escape routes in the event of a major accident event. | Interdependence | -ER001: Muster Area;<br>-ER002: Escape Routes |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| Emergency Lighting functionality<br>To provide adequate illumination | Emergency lightning integrity and functionality | Emergency lighting are functioning correctly | • Function test | 1 Year | IEC 60598-2-22: -Luminaires - Part 2-22: Particular requirements - Luminaires for emergency lighting |
| | | | • Battery autonomy Test | 1 Year | |

| Reliability |
|---|
| Systems should always be available on demand. |
| **Survivability** |
| Emergency lighting shal be functioning during a major hazard scenario |

# ER004 EMERGENCY COMMUNICATION SYSTEM

| SCE PERFORMANCE STANDARD | COMMUNICATION SYSTEM | | Revision 00 |
|---|---|---|---|
| SCE Description | Emergency communication system | SCE ID: | ER004 |
| SCE Boundaries | Emergency Communication system<br>• VHF marine portable radios<br>• SART (Safety And Rescue Transponder)<br>• EPIRB (Emergency Position Indicating Radio Beacon) | Performance Standard Owner | HSE / Instrumentation |
| SCE Goal | To ensure effective communication during emergency conditions | Interdependence | -SD001: ESD system<br>-DS001: F&G detection<br>-ER001: Muster Area;<br>-ER002: Escape Routes<br>-LS001 Personal Survival Equipment |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| **Emergency Communication functionality (VHF Radio)**<br>To ensure communication with the standby vessel | Marine VHF Radio functionality | All Marine VHF Radios function correctly. | • Function test | 1 Year | ETSI EN 300 676-1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Ground-based VHF hand-held, mobile and fixed radio transmitters, receivers and transceivers for the VHF aeronautical mobile service |
| **Emergency Communication functionality (SART / EPIRB for liferaft)**<br>To ensure survival craft | SART / EPIRB functionality | SART / EPIRB function as intended | • Function test | 1 Year | |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| location provision to support organisations. | | | | | using amplitude modulation;<br>Part 1: Technical characteristics and methods of measurement |

| Reliability |
|---|
| Systems should always be available on demand. |
| **Survivability** |
| Communication systems shall remain capable of performing their primary role in adjacent areas not directly affected by a Major Accident Event for a period long enough to execute all the emergency and evacuation actions. |

# ER005 UNINTERRUPTIBLE POWER SISTEM (UPS)

| SCE PERFORMANCE STANDARD | UNINTERRUPTED POWER SUPPLY (UPS) | | Revision 00 |
|---|---|---|---|
| SCE Description | Uninterruptible Power System (UPS) | SCE ID: | ER005 |
| SCE Boundaries | AC/ DC UPS | Performance Standard Owner | HSE / Electrical |
| SCE Goal | To provide an uninterrupted power supply to the vital services of the facility during a Major Accident Event when normal power fails. | Interdependence | -SD001: ESD system<br>-DS001: F&G detection<br>-ER004: Emergency communication |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| UPS functionality<br>To provide electrical power in case of main power supply loss | Batteries availability and functionality | • Power connections and switchgear | • Perform visual inspection of UPS batteries, UPS cabinet to verify condition, and ventilation fan operation<br>• Check all electrical terminations are firmly secured and free from overheating and corrosion | 1 Year | IEC 62040-3:2021 - Uninterruptible power systems (UPS) - Part 3: Method of specifying the performance and test requirements<br>IEC 62040-5-3 Ed. 1.0 b:2016 Uninterruptible power systems (UPS) - Part 5-3: DC Output UPS- Performance And Test Requirements |
| | | • Electrical test of Battery | • Perform battery discharge test and service | 2 Years[14] | |

[14] Considering that frequency is higher than design life of the platform, the task is not applicable to the installation

| Reliability |
|---|
| Systems should always be available at all times. |
| **Survivability** |
| The UPS system shall be arranged in such a way that an MAH will not impact its functionality |

# LS001 PERSONAL SURVIVAL EQUIPMENT

| SCE PERFORMANCE STANDARD | PERSONAL SURVIVAL EQUIPMENT | | Revision 00 |
|---|---|---|---|
| SCE Description | Personal Survival Equipment (PSE) | SCE ID: | LS001 |
| SCE Boundaries | Personal Survival Equipment<br>• Safety Cabinet (With Immersion Suit, Life Jacket)<br>• First Aid Kit<br>• Resuscitation Unit<br>• Escape Masks<br>• Evacuation Stretcher<br>• Liferaft<br>• Lifebuoy | Performance Standard Owner | HSE |
| SCE Goal | To provide all personnel escaping from a Major Accident Event with suitable protective clothing and equipment.<br>To provide personnel with emergency response roles with suitable protective equipment. | Interdependence | -ER001: muster area<br>-ER002 Escape routes<br>-ER004: Emergency communication |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| PSE availability<br>To ensure that personal safety equipment are available and ready for use | Correct PSE available (type and number) | • PSE are in acceptable condition and quantities are adequate | • Visual inspection of Personal Survival Equipment (PSE) to confirm the location, quantity of, and condition of the Personal Survival Equipment (PSE) is correct and serviceable | 6 Months | SOLAS Chapter III Life Saving Appliances and Arrangements; |

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| Reliability |
|---|
| The Personal Survival Equipment shall always be available for all credible emergency scenarios. |
| **Survivability** |
| The lifejacket shall be stored within cabinets if located in the field to provide the best protection from environmental condition<br>Liferafts are to survive major accident events of the facility, to ensure they are available for evacuation of 100% of POB post event. |

# LS002 ALTERNATE MEANS OF ESCAPE

| SCE PERFORMANCE STANDARD | ALTERNATE MEANS OF ESCAPE | | Revision 00 |
|---|---|---|---|
| SCE Description | Alternate Means of Escape | SCE ID: | LS002 |
| SCE Boundaries | Alternate Means of Escape:<br>• Liferaft | Performance Standard Owner | HSE |
| SCE Goal | To provide for the safe escape of all persons from the installation in case arrangements for evacuation fail. | Interdependence | -ER001: muster area<br>-ER002 Escape routes<br>-ER004: Emergency communication |

| Functionality Criteria / Availability | Performance Measure | Assurance Method | Instructions | Freq. | [Doc. Ref.] |
|---|---|---|---|---|---|
| **Liferaft availability / integrity**<br>To provide means to facilitate all personnel for safe escape on the water when primary and secondary means are unavailable. | Liferaft availability and functionality in case of necessity | • Liferafts are in good working conditions and provided with adequate equipment/ accessories | • Visual inspection of liferaft<br>• Perform operational test, if applicable<br>• Perform inspection and replacement of liferaft Accessories/ Equipment (including expiry dates) | 1 Year | SOLAS Chapter III Life Saving Appliances and Arrangements; |

| Reliability |
|---|
| Liferafts shall always be reliable for all credible emergency scenarios. |
| **Survivability** |
| Liferafts are to survive major accident events of the facility, to ensure they are available for evacuation of 100% of POB post event. |