Base Load Power Hub (BLPH)

Design HSSE Plan

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, has 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.

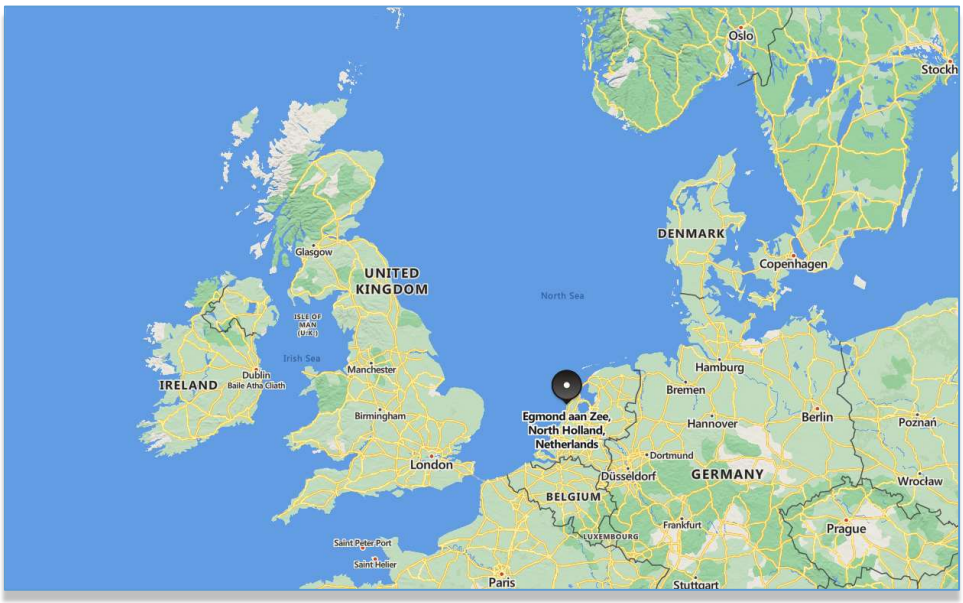


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map

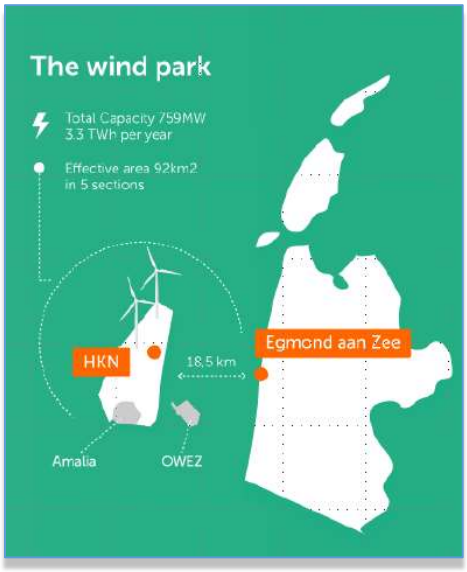


Figure 2 - Wind Park Details

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.

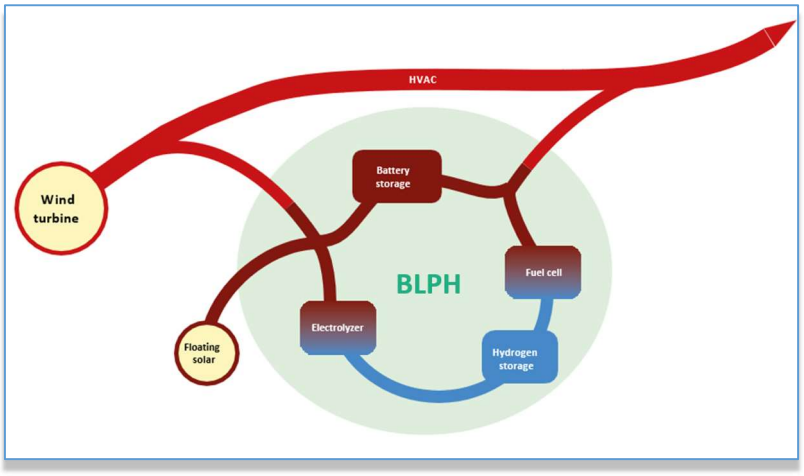


Figure 3 – BLPH Concept

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.

1.2 DOCUMENT PURPOSE

The purpose of this project Design HSSE plan is to outline the basic principles to be implemented during the EPC works. The requirements given in this plan are in accordance with national codes of construction practices and environmental regulations. The purpose of this plan is to:

- Ensure that the requirements and expectations of the Contractor HSE Policy, the Company HSE Policy and Regulatory are all addressed in the design.
- Ensure that potential Health, Environmental, Security, Occupational & Process Safety Hazards and corresponding risks and impacts associated with the project are identified and assessed using appropriate tools and are mitigated through application of risk management techniques.
- Identify the key activities, roles, and responsibilities that will meet the HSE goals during the project.
- Describe the activities that will be performed along the EPC phase to achieve the HSE objectives throughout the project lifecycle.

1.3 DOCUMENT SCOPE

This Project Design HSE Plan shall provide a proactive approach & workable model to achieve the goal of zero accident strategy and to cover the project HSE system and relevant procedures in compliance with local rules and regulations for the BLPH project.

At this EPC stage, the Design HSSE Plan takes a complete view of the project but covers only the current design project phase. For a complete view of all the related activities, to be carried onshore and offshore, this document shall be read in conjunction with the "Construction Execution Plan", doc. N. 123A90-PML-CON-PL-04000 rev. 00, developed by other involved parties of EPCI Contractor.

The scope of this document is applicable only to the topsides structure and associated facilities up until connection with the monopile. The monopile itself is not within the scope of this document.

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2 CODES AND STANDARDS

The facilities engineering work will be based on the following order of precedence:

- European Directives, Dutch standards and regulatory requirements
- Selected DEM-1 requirements and DEM-2 requirements
- Industry or International codes and standards
- Company standards

2.1 EU DIRECTIVES, NATIONAL, REGIONAL AND LOCAL LAWS AND REGULATIONS

Where available the design & construction shall comply with the relevant Dutch Codes & Standards, in absence of such standards, internationally recognized Codes shall be followed.

CE marking and Declaration of Conformity shall be provided in order to fulfil with European Directives requirements, as applicable.

PED	DIRECTIVE 2014/68/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 May 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of pressure equipment
ATEX	Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres
MACHINERY DIRECTIVE	Electrical DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast)
LOW VOLTAGE	2014/35/EU DIRECTIVE 2014/35/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.
EMC	DIRECTIVE 2014/30/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility

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2.2 INTERNATIONAL CODES AND STANDARDS

A complete listing of applicable Codes and Standards is available in the document "Project Code and Standards", doc. N. 123A90-PML-PM-RE-00038, here below are reported the ones that are safety-related or can have impact on risk management aspects.

EIGA Doc 04/18	Fire Hazards of Oxygen and Oxygen-enriched Atmospheres (2018)
EIGA Doc 13/20	Oxygen Pipeline and Piping Systems (2020)
EN 50271	Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen - Requirements and tests for apparatus using software and/or digital technologies (2018)
EN 50402	Electrical apparatus for the detection and measurement of combustible or toxic gases or vapours or of oxygen - Requirements on the functional safety of gas detection systems. (2017)
IEC-61427-2	Secondary cells and batteries for renewable energy storage – General requirements and methods of test –Part 2: On-grid applications
IEC-61936	Power installations exceeding 1 kV a.c. (2014-02)
IEC-62619	Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for secondary lithium cells and batteries, for use in industrial applications
IEC-61508	Functional Safety Of Electrical/Electronic/Programmable Electronic Safety-Related Systems
IEC-61511	Safety Instrumented System for the process industry
IEC-60079	Series Explosive Atmosphere Standards
IOGP	International Association of Oil and Gas Producers / Energy Institute Report 454 : Human Factors engineering in projects.
ISOTR 15916	Basic considerations for the safety of hydrogen systems
ISO 15544:2000	Petroleum and natural gas industries – Offshore production installations – Requirements and guidelines for emergency response
ISO 22734-1:2008	Hydrogen generators using water electrolysis process – Part 1: Industrial and commercial applications
ISO 24409-1:2010	Design, location and use of shipboard safety signs, safety-related signs, safety notices and safety markings
ISO 7010	Safety Signage
NFPA 2	Hydrogen Technologies Code

NFPA 10	Portable Fire Extinguishers
NFPA 53	Materials, Equipment, and Systems Used in Oxygen-Enriched Atmospheres (2020)
NFPA 325	Guide to fire hazard properties of flammable liquids, gases and volatile solids
NFPA 850	Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations (2020)
NFPA 855	Standard for the Installation of Stationary Energy Storage Systems (2020)
NFPA 2001	Standard on clean agent fire extinguishing system (2022)
NORSOK S-002	Working environment
UL 1642	Standard for Safety, Lithium Batteries
UL 1973	Standard for Safety, Batteries for Use in Stationary, Vehicle Auxiliary Power and Light Electric Rail (LER) Applications
UL 9540	Standard for Safety, Energy Storage Systems and Equipment
UL 9540A	Standard for Safety, Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems

2.3 CONTRACTUAL SHELL STANDARDS AND SPECIFICATIONS

The following Standards will be used as reference for EPC design development:

DEP 01.00.02.14-Gen	Layers of Protection Analysis (LOPA)
DEP 30.00.60.20-Gen	Human Factors Engineering – Physical Workspace Design
DEP 32.01.20.12-Gen	IACS Security
DEP 37.01.10.10-Gen.	Offshore Production Installations Basic Surface Process Safety Systems (endorsement of API-RP- 14C and ISO 10418)
DEP 37.01.10.11-Gen.	Design of offshore topsides facilities against fire and blast loading (amendments/supplements to API RP 2FB)
DEP 37.17.10.11-Gen.	Design of Offshore Temporary Refuges
DEP 34.19.20.11-Gen.	Passive fire protection and cold spill protection
DEP 80.00.00.15-Gen	Hazard and Operability (HAZOP) Study
DEP 80.00.10.12-Gen	Layout of Offshore Facilities
DEP 80.45.10.11-Gen	Overpressure and Underpressure – Prevention and Protection
DEP 80.45.10.12-Gen	Emergency depressuring and sectionalising

DEP 80.47.10.12-Gen	Fire and Explosion Control, Protection Systems and Emergency Response for Offshore Facilities
DEP 80.64.10.11-Gen.	Static Electricity

2.4 SHELL STANDARDS APPLICABLE AS NECESSARY

The following Standards are recalled as reference, but they are not mandatory for the EPC project:

DEP 80.00.10.10-Gen	Area Classification for Installations Handling Flammable Fluids
SNERP.80040.00038	BESS Fire Suppression (under development)

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3 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 1 - Definitions and Abbreviations

ALARP	As Low As Reasonably Practicable
API	American Petroleum Institute
BESS	Battery Energy Storage System
BLPH	Base Load Power Hub
BOSIET	Basic Offshore Safety Induction and Emergency Training
DEP	Design and Engineering Practice
EIGA	European Industrial Gases Association
EN	European Norm
EPC	Engineering Procurement Construction
ESIA	Environmental and Social Impact Assessment
HSSE	Health, Safety, Security, Environment
HAZID	Hazard Identification Study
HAZOP	Hazard and Operability Study
HEMP	Hazard and Effect Management Process
HKN	Hollandse Kust Noord
JSA	Job Safety Analysis
LER	Light Electric Rail
LOPA	Layers of Protection Analysis
NFPA	National Fire Protection Association
PTW	Permit to Work
QRA	Quantitative Risk Assessment
RP	Recommended Practice
SGSI	Shell Global Solutions International

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SIL	Safety Integrity Layer
SP	Social Performance
TSO	Transmission System Operator
WTG	Wind Turbine Generator

4 HSSE POLICY

4.1 COMPANY HSSE POLICY

CrossWind will work to design, construct and install the works consistent with the CrossWind aims. We will ensure that the HSSE risks are successfully eliminated or reduced to acceptable levels. HSSE will be managed as a critical business activity. HSSE will be reviewed, reported upon and improved with each stage of the project.

Health: The health of each and every person on the project is important. Not only for project performance but also for project moral and sprit. CrossWind will make every effort to ensure that no one involved directly or indirectly with the project, suffers ill health, because of their involvement in the project. Mental health is a growing concern in everyday life. It is important for all of us to recognise a change, in a work colleague and intervein where necessary.

Drugs & Alcohol: Persons coming to work on CrossWind need to arrive for work, fit and well. They must never be under the influence of drugs or alcohol. It is better to miss a day at work than to come to work under the influence of drugs or alcohol and cause injury to yourself or those working closely with you.

Safety: CrossWind wants to contribute to the development of a sustainable HSSE Performance. We will work every day towards, eliminating incidents that can cause harm to individuals directly or indirectly involved in the project, including our neighbours and the communities we work in.

Security: All persons associated with the CrossWind project are intitled to come to work, without fear of being bullied, harassed, intimidated, robbed or threatened. CrossWind have practices and procedures in place that allow for each individual to be secure in their place of work.

Environment: The environment gives us the resource of wind, we aim to protect the environment we work and travel through and in. We will strive to minimise the use of materials and energy. And constantly look at and work to best environmental practice in our chosen industry.

Compliance: We will make publicly available our reports on goals achieved and missed in equal measure. CrossWind will adhere to all of the licencing conditions associated with the project. We will also constantly review our practices and procedures to ensure performance at the highest level.

Finally, we will promote the Health, Safety, Security and Environment of ourselves, the people working with us, our contractors and those people that might be affected by our acts or omissions.

CrossWind will ensure that every person on the project understands and lives by our principals and this policy.

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4.2 CONTRACTOR HSE POLICY

ROSETTI MARINO

HEALTH, SAFETY AND ENVIRONMENTAL (HSE) POLICY

ROSETTI MARINO is an **EPC Contractor** operating in the Energy and Shipbuilding industries worldwide. With a strong global presence, the company stands out for its **commitment and flexibility, expertise, teamwork, accountability and consistence, drive, and open and honest communication.**



We are committed to protecting the health and safety of everybody who works with us, lives in the communities where we operate, or uses our products. Wherever we are, we conduct our business with respect and care for the environment, ensuring **sustainable** business growth.

We ensure this commitment by:

- Demonstrating an active HSE **leadership** that engages managers, employees and subcontractors.
- Acting on people's values and mindset for an **Incident and Injury Free** workplace, strengthening, at all levels, a generative HSE culture, and the belief that accidents and injuries are not tolerable.
- Managing HSE performances as a line responsibility with clear authorities and **accountabilities**.
- Fostering the principle that HSE is everyone's responsibility, and that we all have the authority to **intervene** when we see unsafe actions or conditions, reinforcing good behaviors and overcoming the "blame culture".
- Applying a systematic approach to **risks** and **opportunities** management, to achieve constant HSE performance improvement, which includes setting objectives and performing regular indicators monitoring, auditing and reviews.
- Designing our workplaces and products to minimize the risk for **people,** and developing work practices to further reduce the risks **ALARP** (As Low As Reasonably Practicable).
- In conjunction with the Health & Sanitary Authorities, with the support of the Company Competent Doctor and with all interested parties, implementing an adequate **safety protocol** to guarantee the healthiness of the workplaces, **preventing and fighting the spread of viruses and pandemics** (such as SARS-CoV-2), informing and training the workers on the **health and hygiene behaviors** to be adopted.
- Encouraging the use of the best available technologies to reduce the impact of our operations on the environment, particularly with regard to an **efficient** use of energy and materials, waste minimization and pollution prevention.
- Carrying out regular training and **development** activities, to enable personnel to get full understanding of their role and of the reference-operating environment.
- Providing relevant information to **subcontractors** and requiring them to provide proper resources for the sound HSE performance of their work.
- **Consulting** and involving workers, their representatives, local communities, government authorities, customers and other stakeholders.
- **Complying** with applicable standards, regulations and laws.
- Working to achieve the best practices in HSE and **continually learning** from experience.

Ravenna, 20 January 2021

Oscar Guerra
Chief Executive Officer

MOD-ORG-01-05

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5 PROJECT HSE MANAGEMENT SYSTEM

5.1 MANAGEMENT OF HSE TOPICS

The control / audit method or activity at different stages of the project to manage identified HSE issues will depend on the nature of the HSE issues identified, right from early stages of the project and through Design, Engineering, Construction, Commissioning and Operations. Most regular HSE issues and criteria shall be adequately addressed by following and implementing Company procedures such as Crosswind's Life Saving Rules. In special cases, it may become necessary to implement project specific controls. The Design HSSE Plan aims to address such project specific controls at each stage.

The project will undertake studies to identify hazards, predict their consequences and will provide a documented demonstration that HSSE & SP risks are both tolerable and reduced to a level that is as low as reasonably practicable (ALARP).

The successful management of HSSE issues in all stages and phases depends upon HSE knowledge, skills and understanding of various personnel and categories. Hence, HSE training and continuous HSE learning process is considered. The Company and Contractor teams must identify project specific control measures required based on identified HSE issues, lessons learnt from past projects and standard practice such that adequate resources for meeting these control measures can be assigned in the planning stage itself.

The responsibilities for closing out the HSE activities shall be assigned to a specific person who shall close out the same within the prescribed time limit.

5.2 HSE RESPONSIBILITIES

It is the responsibility of all individuals working directly or indirectly for the project to become familiar with the Design HSE Plan. Every member of the project team shall be held accountable for the HSSE aspects of activities within her or his scope of control and influence.

It shall be the responsibility of the Company and Contractor teams to delegate the responsibilities to appropriate personnel for the following activities / project specific control measures and deliverables:

- Design HSSE Plan and program administration. Updating of the Plan and the program as the project develops.
- Ensuring that the HSSE Plan is well communicated and an integral part of the project and that the design is risk based through required integrity studies (such as by applying a risk ranking matrix and implementation of recommendations made by safety / risk studies).
- Organizing various studies and reviews, as applicable, such as HAZID, HAZOP, LOPA, FERA, QRA, EERA etc.
- Managing hazards and maintaining applicable risk registers.
- Tracking of action items arising out of different studies and reviews and ensuring timely close-out.
- HSE Audits and Inspections.
- Implementing requirements of HSE Training.

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- HSE Incident Reporting and Investigation.
- Management of Change.

5.3 KEY COMPANY HSE RESPONSIBLE PARTIES

The roles and associated responsibilities for carrying out the above requirements on behalf of Company are described as follows:

5.3.1 Company Project Manager

The Project Manager has overall responsibility for HSE performance on the project. Specific responsibilities include:

- The overall health and safety of project employees.
- Championing HSE by setting a personal example and demonstrate leadership in the implementation of HSE processes and initiatives.
- Actively supporting HSE philosophy.
- Provide the necessary means to implement this Design HSE Plan.
- Promoting the commitment of all employees to achieving HSE excellence.
- Promoting a pro-active approach to safety management in the workplace.

5.3.2 Company Engineering Manager

The Engineering Manager has responsibility for ensuring appropriate engineering standards are developed and implemented to provide a facility that is safe to operate and maintain. Specific responsibilities include:

- Championing HSE within the Engineering team by setting a personal example and demonstrating leadership in the implementation of HSE processes and initiatives.
- Ensuring that the design is conducted in accordance with the relevant Specifications, Standards and project HSE philosophy.
- Overseeing and managing safety in design activities.
- Performing discipline audits.
- Maximising safety in design.
- Interfacing with procurement and construction on safety matters.
- Identifying training needs of discipline personnel.
- Consolidating the project H&S file, as per Dutch regulations.

5.3.3 Company HSE Manager

The HSE Manager is responsible for ensuring that there is sufficient capability to achieve the stated:

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- Design and construction safety goals.
- Design and construction environmental goals.
- Design and construction health related goals.

5.4 KEY CONTRACTOR HSE RESPONSIBLE PARTIES

The roles and associated responsibilities for carrying out the above requirements on behalf of the Contractor are described as follows:

5.4.1 Contractor Project Manager

The Contractor Project Manager is responsible for:

- Overall responsibility for ensuring the implementation of the HSSE requirements.
- Responsible for the total compliance and implementation of this Design HSSE Plan and held accountable for the projects HSE performance.
- Provide the necessary resources required to implement this HSSE plan.
- Display their commitment to HSSE and address any site safety issues as required.
- Recognize good HSE performance from individuals and team.
- Seek advice and assistance from the senior management and keep abreast of changes in legal requirements and best practice.
- Monitoring the project team HSE performance and ensuring the project requirements are attained to the satisfaction of the Company.

5.4.2 Contractor Project Engineering Manager

The Contractor Project Engineering Manager has responsibility for ensuring appropriate engineering standards are developed and implemented to provide a facility that is safe to operate and maintain. Specific responsibilities include:

- Monitor the implementation of this HSSE plan on a day-to-day basis in close coordination with the Contractor HSE Discipline Leader.
- Championing HSSE within the Engineering team by setting a personal example and demonstrating leadership in the implementation of HSE processes and initiatives.
- Ensuring that the design is conducted in accordance with the relevant Specifications, Standards and project HSE philosophy.
- Overseeing and managing safety in design activities.
- Interfacing with procurement and construction on safety matters.
- Identifying training needs of discipline personnel.

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- Monitoring and supervising the project activities in a manner to ensure that the project HSE requirements are met.
- Supporting, as required, in providing necessary information to Company for the preparation of the H&S file (Dossier under the V&G regulation).

5.4.3 Contractor Technical Safety Project Leader

The Contractor Technical Safety Project Leader is responsible for:

- Supporting the Project Manager for HSE in implementing the guidelines given in this document.
- Promoting HSE procedures and the continuous improvement of HSE performance.
- familiarize with current HSE legislation, regulations and requirements relevant to the project and ensuring compliance.
- Advise and assist all personnel on the project with the implementation of HSE in compliance with the relevant HSE legislation.
- Ensuring that project related hazards are identified, risks are assessed, and the necessary mitigation measures are implemented.
- Investigate all accidents to find out the root cause and to take necessary actions to prevent its recurrence.

5.4.4 Contractor Lead Discipline Engineer

The Lead Discipline Engineers are responsible for:

- Ensuring all relevant HSE requirements are addressed in the design.
- Ensuring the technical integrity of the discipline's deliverables through the implementation of checking and design assurance activities.
- Managing the quality and consistency within the discipline through the development of discipline related work procedures.

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6 HSE ENGINEERING

6.1 RISK MANAGEMENT IN DESIGN

The project's design has a key role in the overall HSE impact on the project activities. Positive and negative design can heavily influence many aspects during construction, installation, pre-commissioning, commissioning activities and operations.

In terms of risk management, the designer shall, at all times, utilize the best risk management practices available. The design approach shall incorporate the following features in the design:

- Minimize risk of flammable material accumulation and ignition.
- Optimize removal of fuel source by automatic process shutdown and blow-down upon appropriate fire and gas detection.
- Ensure adequate protection of equipment and plant to control combustion, reduce heat input to vessels, and maintain structural integrity.
- Division of the facilities into separate zones of possible fire involvement (fire areas) either by distance, thermal and/or structural boundaries, to minimize the areas of hazard.
- Physical separation of safety critical elements from hazards areas by distance, thermal, and/or structural boundaries.
- Design for rapid automatic detection of fires and flammable gases at source.
- Provide protected and effective means of egress and escape.
- Ensure ready availability of fire extinguishing appliances and lifesaving appliances.
- ALARP demonstration report will include sheets for each identified Major Hazard and also a descriptive sheet for all the others identified hazards, even if not leading to a Major Hazard.

6.2 DELIVERABLES

The HSE Engineering scope of work will include the following main elements:

- Technical Safety
- Human Factor
- Health
- Security
- Environment and Social performance

A more detailed listing of the HSE Engineering deliverables including all project phases is as below. This list is complying with the agreed Scope of Work and detailed deliverable list is included in the Master Document List:

- Design HSSE plan, the present document;
- HSE Design Philosophy, including Blast Design Philosophy, Human Factors Engineering philosophy and Escape, Evacuation and Temporary Refuge Philosophy;

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- Fire Protection Philosophy, including Fire and Gas Detection Philosophy, Active & Passive Philosophy;
- Emergency Response Plan;
- HAZID, including Terms of Reference, workshop Report and close-out;
- HAZOP, including Terms of Reference, workshop Report and close-out;
- LOPA, including Terms of Reference and Allocation Report;
- Human Factor requirements verification will be performed during the 60% model review;
- Safety Critical Task Analyses Report;
- SIMOPS/MOPO, including Terms of Reference, workshop Report and close-out;
- HSSE Action tracking and Close Out Report, that will refer to all actions coming from safety studies;
- Design ALARP Demonstration Report including Terms of Reference and workshop Report; The report will also include sheets for each identified hazard, not only Major Hazard and related risk assessment.
- Vent Gas Dispersion and Potential Radiation Study;
- Assumption Register, that will define the main assumptions and methodologies to be applied for the development of the risk assessment;
- Fire and Explosion Risk Analysis;
- PFP Design Specification and layouts;
- Dropped and Swinging Object Assessment Report;
- Quantified Risk Assessment Report;
- Evacuation, Escape and Rescue Assessment Report;
- Emergency Systems Survivability Assessment Report;
- Noise Study Report;
- Safety Critical Elements (SCE) and Performance Standard;
- Hazardous Area Classification Schedule and Layouts;
- Hazardous Material Register and Inventory;
- Escape Routes, Fire Fighting, Life Saving Equipment and Signs Layouts Drawings;
- Fire and Gas detection layouts;
- Safety Sign layouts;
- Safety Equipment and fire fighting equipment material requisition, including Specifications and Datasheets, technical bid evaluation and supplier follow-up activities;
- Safety Sign material requisition, including Specifications and Datasheets, technical bid evaluation and supplier follow-up activities.

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7 HUMAN FACTOR ENGINEERING MANAGEMENT PLAN

7.1 GENERAL

Human Factors (HF) has the scope to reduce risks related with human interfaces/activities and to maximise performance through optimising the fit between the people, the hardware, the procedures, with the final aim of minimising the frequency and consequence of human error. The overall objective of the HF support is to provide input to the design process to:

- Improve operability, maintainability, and safety of the BLPH.
- Ensure compliance with statutory and Company requirements.

7.2 HFE STARTEGY

HFE strategy to be applied to the EPC phase of the project aims to ensure the implementation of the HFE requirements in the design of the BLPH.

The HFE requirements and guidelines will be included in the HSE Design philosophy, and the Contractor Project Engineering Manager will verify that each Specialist Leader knows the requirements and implement as necessary. The same approach will be followed with Vendor, and the package leader will have the responsibility to ensure that Vendor properly consider HFE requirements into the package.

During the 60% model review the HFE analysis will be performed, checking requirements and, if any action is required, it will be included in the 60% model review report, to which a close-out action will follow.

Other studies that will be carried out during the during the EPC and that will consider HFE requirements are:

- Safety Critical Task Analysis
- Materials handling Study
- 90% Model Reviews

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8 SECURITY MANAGEMENT PLAN

The CONTRACTOR shall provide a continuous and high level of 24-hour security protection and security services to SPREAD. CONTRACTOR's security procedures shall be in alignment with COMPANY's security policy. CONTRACTOR and COMPANY shall liaise regularly on all security related matters.

A Security Plan will be developed specifically for the construction phase, at work site, and Company HSSE requirements will be complied with.

Regarding the design phase security aspects will be discussed during the HAZID workshop, and, if any specific action is required the recommendation will be collected in action-sheets, tracked and closed during the design phase. It is expected that the same security strategy applied to the overall wind field is applied also to the BLPH, the platform will be equipped with proper video cameras system and authorizations to access the platform, as well as fences/ barrier provision. During the 60% and 90% model reviews attention will be also given to cover these aspects.

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9 HSE TRAINING AND AUDITING

9.1 INDUCTION TRAINING PROGRAMS

The following subjects, as applicable, should be covered with all workers prior to going on the platform to execute assigned maintenance/inspection activities.

- Employee duty with reference to HSE
- HSE Policy and procedures
- Fire Protection, Precaution and Prevention programs.
- Accident Reporting Procedure
- Permit to work systems (hot work, cold work, excavation, confined space, etc.) where applicable
- Emergency Response Procedure.
- Personal Protective Equipment (PPE)
- Emergency Evacuation Procedures and Alarms
- Use of Fire extinguishers
- Risks hydrogen-specific

In relation to Construction, Commissioning and Installation phase, refer to the "Construction Execution Plan", doc. N. 123A90-PML-CON-PL-04000 rev. 00 and related procedures.

9.2 AUDITING

The facility, during operation, shall be subject to a formalised program of HSE audits as per Company requirements. Action plans shall be developed by the Company for the recommendations from the audits and reviews and the risk registers shall be updated accordingly to include the applicable recommendations.

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10 REFERENCES

Ref.	Document number	Deliverable
[1]	123A90-DDL-SAF-RE-30002	Design HSSE plan
[2]	123A90-DDL-SAF-RE-30046	HSE Design philosophy
[3]	123A90-DDL-SAF-RE-30001	Fire Protection Philosophy
[4]	123A90-DDL-SAF-LIS-30000	Hazardous Material Register and Inventory
[5]	123A90-DDL-SAF-RE-30003	Safety Critical ELEMENTS (SCE) and Performance Standard
[6]	123A90-DDL-SAF-RE-30004	HSSE Action Tracking Register and Close out report
[7]	123A90-DDL-SAF-RE-30005	HAZOP Terms of Reference
[8]	123A90-DDL-SAF-RE-30006	HAZOP Report
[9]	123A90-DDL-SAF-RE-30007	HAZOP Close Out Report
[10]	123A90-DDL-SAF-RE-30008	HAZID Terms of Reference
[11]	123A90-DDL-SAF-RE-30009	HAZID Report
[12]	123A90-DDL-SAF-RE-30010	HAZID Close Out Report
[13]	123A90-DDL-SAF-RE-30011	ALARP Terms of Reference
[14]	123A90-DDL-SAF-RE-30012	Design ALARP Demonstration Report
[15]	123A90-DDL-SAF-RE-30013	Hazardous Area Classification Schedule
[16]	123A90-DDL-SAF-LIS-30014	Assumption Register
[17]	123A90-DDL-SAF-RE-30015	Evacuation, Escape and Rescue Assessment (EERA) Report
[18]	123A90-DDL-SAF-RE-30016	Emergency Response Plan
[19]	123A90-DDL-SAF-RE-30017	Emergency Systems Survivability Assessment Report (ESSA)
[20]	123A90-DDL-SAF-RE-30018	Dropped Object and Swinging Loads Study
[21]	123A90-DDL-SAF-RE-30019	Quantified Risk Assessment (QRA) Report
[22]	123A90-DDL-SAF-RE-30020	Fire and Explosion Risk Analysis (FERA) report
[23]	HOLD	PFP Design Specification
[24]	123A90-DDL-SAF-RE-30021	Vent Gas Dispersion / and Potential Radiation Study
[25]	123A90-DDL-SAF-DL-30022	Hazardous Area Classification Layout - lower deck
[26]	123A90-DDL-SAF-DL-30023	Hazardous Area Classification Layout - upper deck
[27]	123A90-DDL-SAF-DL-30024	Hazardous Area Classification Layout - section
[28]	123A90-DDL-SAF-DL-30025	Escape Routes, Fire Fighting, Life Saving Equipment and Safety Equipment Layouts Drawings - lower deck
[29]	123A90-DDL-SAF-DL-30026	Escape Routes, Fire Fighting, Life Saving Equipment and Safety Equipment Layouts Drawings - upper deck
[30]	123A90-DDL-SAF-DL-30027	F&G detectors Layout - lower deck
[31]	123A90-DDL-SAF-DL-30028	F&G detectors Layout - upper deck
[32]	HOLD	PFP Layout - lower deck
[33]	HOLD	PFP Layout - upper deck

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[34]	123A90-DDL-SAF-DL-30029	safety sign Layout - lower deck
[35]	123A90-DDL-SAF-DL-30030	safety sign Layout - upper deck
[36]	123A90-DDL-SAF-MR-30031	FF and Safety Equipment MR
[37]	123A90-DDL-SAF-SP-30032	FF and Safety Equipment Specifications
[38]	123A90-DDL-SAF-DS-30033	FF and Safety Equipment Datasheets
[39]	123A90-DDL-SAF-TBE-30034	FF and Safety Equipment TBE
[40]	123A90-DDL-SAF-RE-30035	LOPA ToR
[41]	123A90-DDL-SAF-RE-30036	LOPA Allocation report
[42]	123A90-DDL-SAF-RE-30037	SIMOP/MOPO ToR
[43]	123A90-DDL-SAF-RE-30038	SIMOP/MOPO report
[44]	123A90-DDL-SAF-RE-30039	SIMOP close out reports
[45]	123A90-DDL-SAF-RE-30040	Safety Critical Task Analyses Report
[46]	123A90-DDL-SAF-RE-30041	Noise Assessment Study Report
[47]	123A90-DDL-SAF-MR-30042	Safety Sign MR
[48]	123A90-DDL-SAF-DS-30043	Safety Sign Specifications and Datasheets
[49]	123A90-DDL-SAF-TBE-30044	Safety Signs TBE

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