Base Load Power Hub (BLPH)

HIRA Report

Load Out of BLPH, Transition Piece and Caisson Frame

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Table of contents

1 INTRODUCTION 4

1.1 Project Overview 4

1.1.1 Project Location 4

1.1.2 Project Concept 5

2 DOCUMENT PURPOSE 6

2.1 REFERENCES 6

2.2 DEFINITIONS AND ABBREVIATIONS 6

3 HIRA STUDY METHODOLOGY 10

3.1 HIRA workflow 10

3.2 Risk Assessment 11

4 HIRA WORKSHOP AND TEAM MEMBERS 13

5 HIRA OUTCOMES 14

6 ANNEXES 14

Annex 1 Risk Register 15

Annex 2 Attendance sheet 20

Annex 3 Hazard Guidewords 23

List of Figures

Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map 4
Figure 2 - Wind Park Details 5
Figure 3 – BLPH Concept 5
Figure 4 – Risk Assessment Matrix ..... Errore. Il segnalibro non è definito.

List of Tables

Table 1 - Node description 11
Table 2 – Risk Assessment Matrix (RAM) 12
Table 3 – HAZID Attendees 13
Table 4 – Recommendations 14

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.

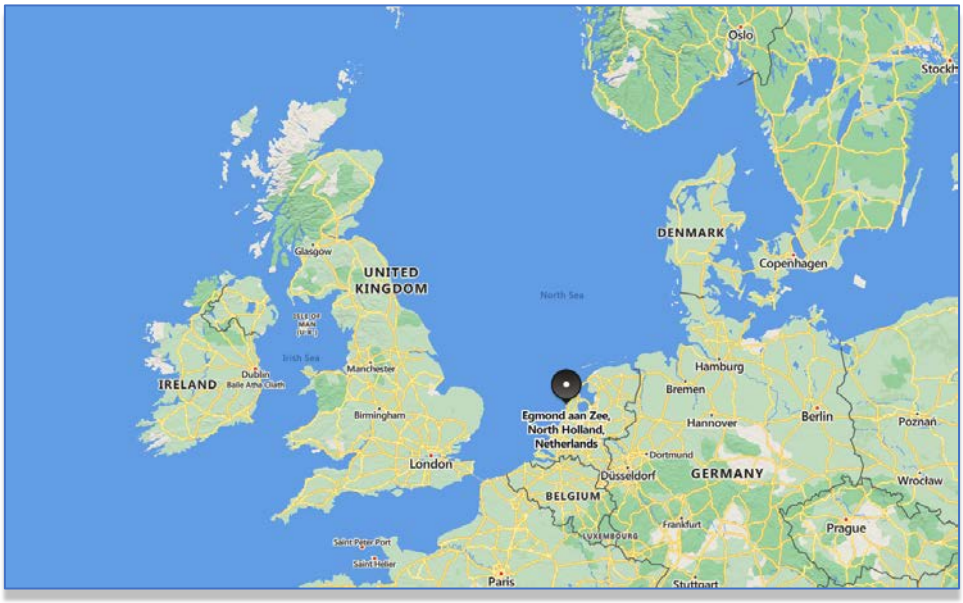


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map

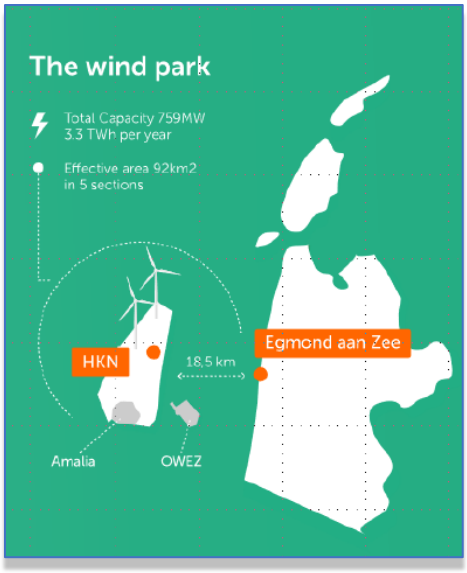


Figure 2 - Wind Park Details

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.

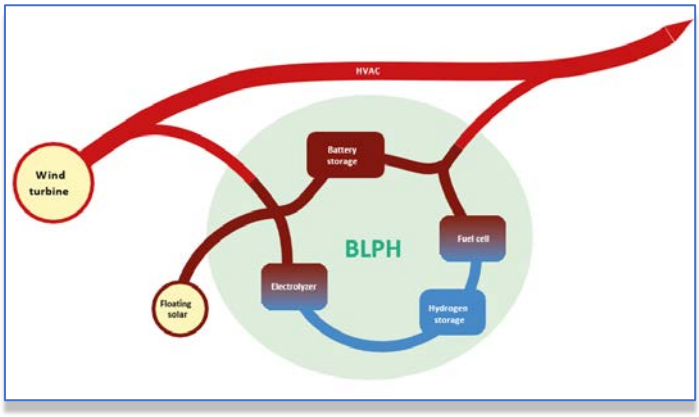


Figure 3 – BLPH Concept

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 is 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.

2 DOCUMENT PURPOSE

The Hazard Identification and Risk Assessment (HIRA) Report provides a systematic assessment of potential hazards associated with a particular project, process, or operation. The primary objective is to identify and evaluate potential risks at an early stage, enabling the duty holders to implement appropriate measures to mitigate these risks and ensure a safe system of work and reduction of risks to an acceptable level.

The objective of the Hazard Identification Risk Assessment (HIRA) is to identify and assessing the hazard associated during the weighing and Load Out of the BLPH module, Transition Piece and Caisson Frame and thereby controlling the risk by implementing mitigation measures before the start of the work to avoid incidents.

2.1 REFERENCES

Doc. No.	Description
123A90-PML-QHSE-PL-00001	Contract HSSE Plan - Onshore Phase
123A90-DDL-TI-RE-99002	Load Out Manual with Ballast Sequence
123A90-FDL-MT-DD-00405-01	Mooring Scheme
CW-I-WP4-2023-05 - SECTION VIII	Contract HSSE Requirements

2.2 DEFINITIONS AND ABBREVIATIONS

ALARP	As Low as Reasonably Practicable
CM	Construction Manager
CPY	Company - Crosswind
CTR	Contractor – Rosetti Marino
ERT	Emergence Response Team
HAZID	HAZard IDentification
HIRA	Hazard Identification and Risk Assessment
HSE	Health, Safety and Environment
IOGP	International Oil & Gas Producers
JSA	Job Safety Analysis
MSDS	Material Safety Data Sheet
PHSEM	Project HSE Manager
SPMT	Self-Propelled Modular Transporter
PMT	Project Management Team
PPE	Personal protective equipment
SIMOPS	Simultaneous Operations
STARRT / TBT	Safety Talk Analysis Reduction Talk / Toolbox Talk
YPB	Fabrication Yard "Piomboni" located in Via Del Marchesato, 37 - Marina di Ravenna (RA)

For this document, the words and expressions listed below shall have the meaning assigned to them as follows:

Definitions	Description
ACCIDENT	An unplanned, unwanted event which leads to injury, damage or loss, at yard or externally.
ALARP	A risk that has been reduced to a reasonably practicable level that CONTRACTOR is willing to assume with respect to its legal obligation, its HSE policy and its HSE objectives
Applicable Laws	LAWS relating to HSE, including by obtaining any required permits, certifications or authorisations, prior to conducting the relevant part of the WORK
Asset Damages	Accidents that cause damage to an equipment/object in use. Such an accident may require the suspension of operational activities to repair or replace the equipment.
COMPANY	CROSSWIND
CONTRACTOR	Rosetti Marino SpA
Control Measures	Precautionary measures which reduce or eliminate risk by taking compensatory, mitigation and corrective actions.
Crisis	An acute situation which falls outside of normal business continuity and emergency response arrangements. It significantly threatens (actually or potentially) the safety or well-being of people, the environment, the organisation's reputation and/or its financial position. Ultimately it may put an organisation's license to operate at risk.
Emergency	An Emergency is an unforeseen event/situation that includes one or more of the following: • Has a high probability of escalating to cause immediate danger to life, health, property or environment. • Is immediately threatening to life, health, property, or environment. • Has already caused loss of life, health detriments, property damage or environmental damage
Emergency Response	Actions taken during an emergency to: • Eliminate and/or control and/or manage the harm, loss or impact of the same • Prevent further harm • Promote recovery
Emergency Response Team (ERT)	The team of individuals that responds to an emergency at the asset/location. In most foreseeable cases this shall mean the local site-based emergency response teams at the various locations.
Environmental Accidents	Accidents involving the release of substances from plants and equipment that could be harmful to the environment, including both noise and radiation.
Equipment	Means all equipment, instruments, machinery, plant (floating or otherwise), tools, materials, supplies, scaffolding, temporary works, buildings, and structures (including warehouses, offices, docks, berths, moorings and camps) and all other items supplied, consumed or used by CONTRACTOR or its SUB-CONTRACTORS and vendors in the performance of the WORK.
Hazard	A source of danger with the potential to cause illness, injury or death to personnel or damage to property, facility, or environment

Definitions	Description
Hazardous Situation	Set of conditions and/or circumstances that lead to an increased exposure to hazards of people, property, or environment. In this type of incident, the unplanned and uncontrolled event is more likely to happen, but has not occurred: If it did, it would fall under the category of "near miss" or any other category for "accident" (according to the severity of consequences).
HSE standards	HSE standards that would be expected in accordance with the practises, methods, specifications generally followed by a competent and experienced contractor in the international oil and gas industry in similar circumstances, as the IOGP Report 577/Feb 2017 "Fabrication site construction safety recommended practices" attached in Exhibit E
Impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services
Incident	An unplanned, uncontrolled or undesirable event or chain of events that has the potential to result or that has resulted in at least one fatality, injury, illness, environmental damages, financial loss (material loss or production shortfall) and/or affecting company's reputation.
Initial risk	The risk prior to implementation of the risk reduction measures.
Life Saving Rules (IOGP - SHELL)	Rules focus on the activities which, through rigorous data analysis, have been shown to most likely result in fatalities. Each Rule consists of an icon and simple life-saving actions individuals can take to prevent a work-related fatality.
Near Miss	An unplanned, unwanted event that had the potential to lead to injury, damage or loss (but did not, in fact, do so).
On-scene commander	The person, among the staff of the asset holder, in charge at the scene of an incident.
Project	HOLLANDSE KUST NOORD WIND PARK Project
Risk	An unwanted event characterized by its likelihood of occurrence and the extent of consequences arising from the occurrence of this event.
Risk Analysis	Is the process to comprehend the nature of risk and to determine the level of consequence and likelihood.
Security Threats	A Security Threat is a malicious act that aims to corrupt or steal data or disrupt the systems of an organization or the entire organization.
SUBCONTRACTOR	Means any company or person to whom CTR has subcontracted directly or indirectly at any level the performance of any part of service / work.
Qualified Person (PEI):	"Person with the technical capacities to perform electrical works under tension. The eligibility shall be certified and issued in return for a training process exceeded successfully, that include theoretical and practical exercises."
Expert Person (PES):	"Person with education, knowledge and experience relevant, able to analyze the risks and to avoid the dangers that electricity can create". This person has an appropriate training, gained experience and general knowledge of electrical safety. This must also be able to organize independently and safely any type of electrical work and to detect and prevent electrical hazards associated, applying the appropriate measures to eliminate or reduce them. PES has also the ability to deal with unexpected events that can occur during electrical works and the ability to properly inform and educate a PAV to perform a work safely.

Definitions	Description
Warned Person (PAV):	"Person adequately warned by PES to avoid the hazards that electricity can create." This person has a proper training, acquired knowledge on safety of electricity works and ability to understand instructions from a PES; it must have the ability to organize and execute safe work after receiving instructions from a PES. Also, it must have the ability to face difficulties unexpected, although it might not be able to face them properly in autonomy.
Work	All work to be carried out including supply of all material and performance of all services to be provided by CONTRACTOR in accordance with the CONTRACT.

Here below a list of definitions of words often used during an HAZID Session:

Guideword: Key words to be used in association with their associated expanders in order to guide and stimulate creative thinking towards the identification of representative hazards.

Hazard: Anything with the potential to cause harm, including ill health or injury, damage to properties and environment or community impact.

Incident: Any accident and near miss according to their definition

Likelihood: The expectation, possibility or chance of something happening (also referred as frequency).

Loss: The adverse impact of any event on business causing:

- Harm to persons
- Harm to the environment
- Asset damage
- Damage to community

Node: A logic section of the plant/system to be examined in the HAZID (typically consists of a specific project configuration like Option 1, Option 2, etc. or a part of the facilities to be analysed.

Residual risk: The level of risk remaining after implementation of existing controls and recommended preventive and mitigating measures.

Risk: Combination of the likelihood of occurrence of a hazardous event and the severity of consequence that can be caused by the event or exposure(s).

Risk Ranking: A means of expressing the risk of an activity in terms of a value that represents both its likelihood and severity.

3 HIRA STUDY METHODOLOGY

The main reasons for carrying out HIRA studies are to:

- provide a forum to draw on collective experience at an early stage to ensure inherent safety, health aspects/risks and environmental issues are properly considered in design;
- focus on identifying hazards to people working on the installation, both in terms of accident or long/short term exposure to biological/chemical hazards, and/or to the Assets considering also security aspects and/or to environment or community;
- check whether the precautions and safeguards incorporated in the project development are sufficient to either prevent the hazard to occur or mitigate the severity of any consequence and reduce the risk to ALARP level.

The HIRA technique consists of a structured brainstorming of potential hazard scenarios using a comprehensive set of guidewords. Guidewords used in the assessment are shown in Annex 3 Hazard Guidewords. The adequacy and presence of the existing safeguards (either preventive or mitigating) are assessed and finally, the risk associated to the hazardous event is evaluated with the support of the risk matrix shown in Table 4. If the identified control measures are not considered sufficient, recommendations are made, which could reduce the frequency or severity of the hazard identified.

HIRA gives emphasis to the use of the checklist as a prompt for the team to brainstorm. The team knowledge and creativity are used to identify credible causes and hence applicability of the issues. It is important that the checklist is used in a creative manner and not applied too rigidly. It is only in this way that new or unusual hazards will be recognised, or where specific combinations of factors will be identified as causes of concern.

The HIRA has been carried out in accordance with COMPANY procedure and the principles of ISO 17776.

The HIRA Process takes part in two main steps:

- HAZARD IDENTIFICATION to identify the potential hazards of project construction activities.
- RISK ASSESMENT to identify the effects of the hazards and the control measure to put in place to reduce the risk to a tolerable rate (ALARP) by using the hierarchy of controls:

    1. Avoid Risks,
    2. Elimination/Substitution of the hazard,
    3. Reduce Exposure or the Time of Exposure,
    4. Isolation/Segregation,
    5. Engineering Controls,
    6. Safe Systems of Work,
    7. Training and Information.

3.1 HIRA workshop

The HIRA was performed by reviewing the precompiled worksheet (Risk Register) based on experience of CTR former industry data.

The leader started the workshop with the first 'Node' to be studied; the intention of that node was discussed and agreed by the team. Table 1 identifies the nodes used in the analysis.

Node	Node Description
1	Workplace
2	General – Work equipment
3	General – Weather condition
4	Physical agents
5	Biological agents
6	Fire & Explosion
7	Special condition
8	Work on barge
9	Movin structure by multi-wheel SPMT
10	Seafastening of structures
11	Weighing

Table 1 - Node description

The leader then moved on precompiled Risk Register and within each work phase, the team followed the following procedure.

- The leader nominated the work phase from the risk register and then asked the team to consider the hazards and threads of the work phase.
- The team assessed the applicability of each guide word. If the guide word was considered applicable, the leader asked the team to identify by brainstorming any potential hazardous events and their effects.
- The brainstorming process was then used to identify all the potential threats or causes of the release of the hazard.
- The team then assessed appropriate controls that would be put in place during project development to prevent or control each threat.
- New recommendations were added where the team considered that risk should or could be reduced further to ALARP.

3.2 Risk Assessment

Team members decided the importance or severity of each issue based on the risk assessment matrix.

The Risk Assessment Matrix (RAM) is used to give a simple priority rating on a qualitative basis for each of the risk categories (people, assets, environment and community) to the risks associated with the hazards/issues identified. The worksheet (spreadsheet) is designed such that each issue may be categorised by colour and by grid reference in the RAM.

It is important to recognise that the risk rankings performed was based on a Worst-Case Credible scenario. A worst-case credible scenario is an event that could realistically occur and that has the worst outcome from release of a Hazard, if Controls fail. The approach defines the risk ranking associated with each released hazard, which is useful in ranking the hazards according to their intrinsic potential to cause harm in the actual operating environment. It allows prioritisation of mitigation measures to be determined by the project based on maximising risk reduction.

- High Risk (red). Issues that could affect the viability of the project or have significant HSE or societal impact (e.g. grid D4 or E5).

- Medium Risk (yellow). Issues that will require significant cost or time resources to resolve (e.g. grid B4 or C3).
- Low Risk (dark blue). Issues, which need to be managed for continuous improvement through the effective implementation of the HSSE Management System (e.g. grid A4 or B3).
- Low Risk (light blue). Issues which need to be managed for continuous improvement, although Businesses may set lower priority for further Risk reduction. (e.g. grid B1 or C0).

SEVERITY	CONSEQUENCES				INCREASING LIKELIHOOD				
	People	Assets	Community	Environment	A	B	C	D	E
					Never heard of in the Industry	Heard of in the Industry	Has happened in the Organisation or more than once per year in the Industry	Has happened at the Location or more than once per year in the Organisation	Has happened more than once per year at the Location
0	No injury or health effect	No damage	No effect	No effect					
1	Slight injury or health effect	Slight damage	Slight effect	Slight effect					
2	Minor injury or health effect	Minor damage	Minor effect	Minor effect					
3	Major injury or health effect	Moderate damage	Moderate effect	Moderate effect					
4	PTD or up to 3 fatalities	Major damage	Major effect	Major effect					
5	More than 3 fatalities	Massive damage	Massive effect	Massive effect					

Table 2 – Risk Assessment Matrix (RAM)

4 HIRA WORKSHOP AND TEAM MEMBERS

Dates & locations: 28/05/2025 - Yard Piomboni & Teams;

The HIRA workshop consisted of a multi-disciplinary team of engineers and other key personnel to enhance the identification of potential hazards. HIRA was led by CTR HSE Manager.

The team members who attended the HIRA workshop are presented in Table 3 below. Not all participants were available for both sessions. The attendance lists are shown in Annex 2.

Name	Role/Discipline	Company	Note
Ricci Picciloni Daniele	Project HSSE Mgr.	Rosetti Marino	
Nicolas le Brun	HSE Lead	CrossWind	
Adrian Sas	Site HSE	Crosswind	
Enrico Bresciani	Project Manager	Fagioli	
Amish Forsyte	MWS	ABL	On Teams
Jeroen Van Loon	CM	CrossWind	On Teams
Alessandro Balzarotti	T&I Engineer	Tecon	On Teams
Jan Duinhoven	CM	Crosswind	On Teams
Marcel Van Veen	T&I Engineer	Crosswind	On Teams

Table 3 – HIRA Attendees

5 HIRA OUTCOMES

This section summarizes the key outputs of the HIRA with detailed worksheets shown in Annex 1 Risk Register. No High Risk (red) are identified between the activities assessed.

A total of 7 recommendations emerged from the HIRA and were addressed and closed during some internal review cycles prior to the document being issued. It remained an open recommendation, presented in Table 4. The table lists the actions by action number, the responsible party and hazard reference number referring to the location of the individual Node in the worksheet.

Node	Item	Threat	Recommendations	Responsible	Due date
Node 1	1.2.2	Land subsidence. Water discharged to soil for a long period below WTP	Joint survey with MWS / RM / CW of the condition of the ground around seawater vessels	RM/CW	Week 24
Node 8	8.1.1	Man overboard	Man Overboard drill before load out	RM	Week 24
Node 9	9.3.1	Drops of object during the movement of structure	Overall dropped object inspection on the BLPH and TP	RM/CW	Before placing SPMT

Table 4 – Recommendations

6 ANNEXES

Annex 1 Risk register

Annex 2 Attendance sheet

Annex 3 Hazard Guidewords

Annex 1 Risk Register

n. (N	Work phase / node	n.(H)	Hazard /Situation	n.(E)	Event / risk description	S	L	R	Control measures	Additional actions required	Resp. for action	Action due date	S al	L al	R al
1	**Workplace**	**1.1**	Stability and solidity of the deck structures / support	1.1.1	Collapse of structures	4	C	**4C**	Approved Engineer calculation report and barge's certificates (general note: reference of documentation)				4	A	**4A**
1		**1.2**	Stability and solidity of the soil	1.2.1	Land subsidence. Water discharged to soil for a long period below WTP	4	C	**4C**	Confirm the load bearing is within the weight of the structures (loadout manual and Load-bearing report)	**Joint survey with MWS / RM / CW of the condition of the ground around seawater vessels**	**RM/CW**	**W23**	4	A	**4A**
1		**1.2**		1.2.2	Bollard failure	4	C	**4C**	Confirm the bollard capacity is within the tension of the mooring lines (loadout manual and bollard -bearing report)				4	A	**4A**
1		**1.3**	Yard circulation	1.3.1	Collisions of people with Moving Vehicles	3	C	**3C**	Comply with site safety procedure (PRO-HSE-16) Patterns of movement in and around the workplace - to segregate working loadout area				2	B	**2B**
1		**1.3**		1.3.2	Collisions of Vehicles	3	C	**3C**	Identify and fence/segregate temporary storing areas Maintenance of routes Change circulation pattern Yard reception to inform driver				1	B	**1B**
1		**1.4**	Emergency routes and exits	1.4.1	Obstructed or not adequate emergency routes (from barge)	3	C	**3C**	Gangways to access the barge as per safety document (ex D.Lgs. 272/97). **When in med-mooring position ensure safe access by handrails** Keep clear the gangways / accesses all the time. (access to module when in sail configuration moored along side)				3	A	**3A**
1		**1.5**	Natural and artificial lighting	1.5.1	Low visibility during operation	3	C	**3C**	Light towers in the loading area for night activity positioned to avoid glare (position of light towers to be considered during the loadout). Lighting system of module operative (fully commissioned)				3	A	**3A**
1		**1.6**	Emergency response	1.6.1	Poor response management	4	C	**4C**	ERT + Yard Emergency Equipment Fire watchers during hot work (during night also) During Load Out tug in standby position in radio contact with the YARD MANAGER.				3	A	**3A**
1		**1.7**	Confined space	1.7.1	NA				No confined space. In case comply to site procedure						
2	**General -Work equipment**	**2.1**	Material handling equipment	2.1.1	Failure of lifting machinery	4	C	**4C**	Adequate SWL and maintenance Keep off from the line of fire Fence the line of fire zone of the mooring lines				4	A	**4A**
2		**2.1**		2.1.2	Failure of lifting gears	4	C	**4C**	Periodical inspection and colour code. Mooring line certificate included in the Load Oud procedure. (to be transmitted) Keep off from the line of fire				4	A	**4A**
2		**2.1**		2.1.3	Wrong slinging / lifting configuration	4	C	**4C**	Trained riggers. Lifting team to be identify in advance for train checking. non routine lift lifting covered by lifting plan +TRA/JSA complex lifting covered by plan + TRA/JSA + PTW Keep off from the line of fire				4	A	**4A**
2		**2.2**	Portable, electric-powered tools (grinders)	2.2.1	electrocution	3	C	**3C**	Double isolation tool and safety transformer when standing on conductors structures. Prepare temporary power point on the Barge before the Load Out. **Cable management**				2	A	**2A**
2		**2.2**		2.2.2	cuts, lacerations, and contact with machines,	3	C	**3C**	Tools conform to safety standard PPE				2	A	**2A**

n. (N	Work phase / node	n.(H)	Hazard /Situation	n.(E)	Event / risk description	S	L	R	Control measures	Additional actions required	Resp. for action	Action due date	S al	L al	R al
2		**2.3**	Portable welding apparatus (on barge)	2.3.1	electrocution	3	C	**3C**	periodical inspection to keep in dry place				2	A	**2A**
2		**2.3**		2.3.2	fumes	3	C	**3C**	Natural ventilation PPE				2	B	**2B**
2		**2.3**		2.3.3	Errant current dispersion	2	B	**2B**	equipotential grounding of barge/barge hull (one earthing cord each 20mt at least) working cable connected near the welding point				2	A	**2A**
2		**2.3**		2.3.4	UVC rays - eye burns / skin burns	3	C	**3C**	welding Screen in place + PPE				3	A	**3A**
2		**2.3**		2.3.5	Hot surfaces burns	3	C	**3C**	Adequate Ergonomic / Hot surface protection PPE				3	A	**3A**
2		**2.4**	Mechanical failure	2.4.1	Tug line failure	4	B	**4B**	Availability of more mooring lines on tugs ; Certified tug lines, Perform inspection of tug line before ops Weather criteria and monitoring, Daily inspection of mooring line, Only Authorized personnel in the quayside area, Warning signs to alert tension on the tug lines, Certificates available for MWS				3	B	**3B**
2		**2.4**		2.4.2	Mooring line under tension	4	B	**4B**	Brand new mooring ropes Personnel informed during TBT regarding line of fire, do not stand in front of tug line in tension. Barricate winch / bollard area				4	A	**4A**
3	**General -Weather condition**	**3.1**	Strong wind	3.1.1	Difficult execution of the Job (lifting)	3	C	**3C**	stop work near water In case of extreme wind tug assistance **Windspeed limit for the operation is 10 m/s** Mooring arrangements and SPMTs designed for 15 m/s Availability of windspeed meters at yard				3	A	**3A**
3		**3.2**	heavy rain	3.2.1	Difficult execution of the Job	3	B	**3B**	no work at height no welding outdoor Add gravel on the tranfer path at yard				3	A	**3A**
3		**3.3**	Atmospheric lightening	3.3.1	Lightening stroke	3	B	**3B**	Lightening protection report in place. Lower the Crane Boom Operation suspended with thunderstorm				3	A	**3A**
4	**Physical agents**	**4.1**	Noise	4.1.1	hearing impaired	3	C	**3C**	Reduce as much as possible exposure to noise PPE				3	A	**3A**
4		**4.2**	Vibration	4.2.1	HAVS	3	B	**3B**	Tools checked and maintained Limit the exposure				3	A	**3A**
4		**4.3**	Ionizing radiations	4.3.1	Exceeding the exposure limits	2	B	**2B**	No Rx testing planned. Coordinate NDT activity with adjacent projects						
5	**Biological agents**	**5.1**	Viruses / bacteria	5.1.1	Infection	1	B	**1B**	anti-tetanus vaccination				3	A	**3A**
6	**Fire & Explosion**	**6.1**	Explosive atmosphere	6.1.1	Explosion	4	A	**4A**	Gas free test on barge before hot works **Keep minimum LPG quantities on Board** Fire watcher to control hot works and Fire Equipment ready for use				4	A	**4A**
6		**6.2**	flammable substances (solid, liquid or gaseous)	6.2.1	Fire	4	C	**4C**	Remove obsolete flammable material from site **Keep minimum LPG quantities on Board** **Inspection of welding equipment and valves** Fire watcher to control hot works and Fire Equipment ready for use				4	A	**4A**
6		**6.3**	presence of source of ignition	6.3.1	Fire	4	C	**4C**	Fire watcher to control hot works and Fire Equipment ready for use				3	A	**3A**
7	**Special conditions**	**7.1**	Work-related stress	7.1.1	Human error	3	C	**3C**	Plan one day free per week at least do not extend shift over 12hrs				3	A	**3A**
7		**7.2**	Night work,	7.2.1	Human error	3	C	**3C**	Plan for recovering time				3	A	**3A**

n. (N	Work phase / node	n.(H)	Hazard /Situation	n.(E)	Event / risk description	S	L	R	Control measures	Additional actions required	Resp. for action	Action due date	S al	L al	R al
7		**7.3**	Overtime	7.3.1	Human error	3	C	**3C**	Do not work on extended shifts (max 12hrs) - plan for shift rotation.				3	A	**3A**
7		**7.4**	Solo work in critical conditions	7.4.1	Delayed response to a situation	3	C	**3C**	No work alone allowed.				3	A	**3A**
8	**Work on Barge**	**8.1**	Working over / near water	8.1.1	MOB	3	C	**3C**	Erect barrier at the deck perimeter; Use of work-vest when barrier is not in place; Life buoy in the vicinity of the overboard work and as per pattern submitted to authorities.	**Man Over Board drill before load out.**	**CTR HSE Dept.**	**W24**	3	A	**3A**
8		**8.2**	Opening on the deck (hatch to Ballasting rooms)	8.2.1	Falls / tripping	3	C	**3C**	All hatches shall be closed**,** if few hatches shall remain open segregate opening with solid barrier. **No open hatches on the trailer paths**				3	A	**3A**
9	**Moving structure by multi-wheel SPMT**	**9.1**	Loaded wheels	9.1.1	Failure of wheels;	4	C	**4C**	Contingency plan in case of wheel failures; Spare part available at site Maintenance and check of wheels safety elements; Wheel configuration driving of multi-wheels as per load out manual. SPMT readiness checklist **Max travelling speed of the convoy is 0,5 Km/h**				4	A	**4A**
9		**9.1**		9.1.2	Failure of hydraulic multiwheel system	4	C	**4C**	Contingency in number of the multi-wheel 2-3 motorized wheel + 2-3 non motorized wheels available as spare at site it is possible to exclude the failed one at any time. Spill kit available				4	A	**4A**
9		**9.1**		9.1.3	Failure of tyres	3	C	**3C**	Maintenance and check of tyres; Inspection of transfer route.				3	A	**3A**
9		**9.2**	SPMT power unit	9.2.1	Failure of PPU	3	C	**3C**	Spare PPU available at site				3	A	**3A**
9		**9.3**	Difficult access of structure on wheels to barge	9.3.1	Failure of Mooring	4	C	**4C**	Med-mooring as per load out manual. **Mooring lines supplied by CTR brand new** Preinstalled contingency mooring lines Certificates available Tug available on call				4	A	**4A**
9		**9.2**		9.2.2	Failure of ballasting	4	C	**4C**	Comply with ballasting procedure (reference to Ballasting Document); Maintenance and check of Pumps; Contingency pumps in place; Dedicate competent ballasting team. Yard Manager to supervise the ballasting team. Coaching with OCEAN ballasting team. Testing of pumps before the Load out.				4	A	**4A**
9		**9.3**	Dropping object	9.3.1	Drops of object during the movement of structure	3	C	**3C**	No loose items during moment of structures. Inspection of module and TP before load out. Keep clear the area during the movement of structure - Restricted access. **During Module inspection consider the correct fixing of the**	**Overall dropped object inspection on the BLPH and TP**	**RM / CW**	**Before placing SPMTs**	2	B	**2B**
10	**Sea Fastening of Structures**	**10.1**	Hot works	10.1.1	see point event related to 2.2 - 2.3 - 6	3	C	**3C**	see point control measure related to 2.2 - 2.3 - 6				3	A	**3A**
10		**10.2**	Work at height	10.2.1	falling form height	4	C	**4C**	Scaffolds as per procedure; Use of PPE + ladders only when it is not possible - for technical reason only - to assembly scaffold.				3	A	**3A**
10		**10.3**	Work over Board. Minor activities performed from a small floating barge	10.3.1	fall into water	3	C	**3C**	work vest when exposed to the risk of falling into water; **Inflatable Life vest expected to do not impair the use of remote controls;** assistance - visual contact; Activity in daylight only;				3	A	**3A**

n. (N	Work phase / node	n.(H)	Hazard /Situation	n.(E)	Event / risk description	S	L	R	Control measures	Additional actions required	Resp. for action	Action due date	S al	L al	R al
11	**Weighing**	**11.1**	positioning of load cells and hydraulic jacks	11.1.1	Unplanned movement of structures	4	C	**4C**	No access to Module Exclusion zone on ground				4	A	**4A**
11		**11.1**		11.1.2	Failure of hydraulic system	3	C	**3C**	Check of element under pressure / connections Spill kit / ERT at site at quay side Contingency of spare jacks				3	A	**3A**

Annex 2 Attendance sheet

Progetto / *Project*	123A90 Base Load Power Hub
Data / Ora:	28/05/2025 / 9:00 – 13:00
Luogo / *Venue*	YPB – Meeting Room Box F piano terra
Oggetto / *Subject*	HIRA Load Out BLPH, Transition Piece and Caisson frame

Partecipanti / Attendance sheet

Nome / *Name*	Role / *Position*	Società / *Company*	Firma / *Signature*
1. DANIELE RICCI PICCIONI	PMEM	ROTETTI	
2. ADRIAN SAS	HSE SR	CrossWind	
3. N GB	HSE	CW	
4. ENRICO BRESCIANI	PM	FAGIOLI	
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1. Riepilogo

Titolo riunione	HIRA Workshop BLPH Load Out
Persone che hanno partecipato	7
Ora di inizio	5/28/25, 8:59:45 AM
Ora di fine	5/28/25, 11:43:32 AM
Durata della riunione	2h 43m 46s
Tempo medio di partecipazione	2h 33m 56s

2. Partecipanti

Nome	Primo accesso	Ultima usci Durata riun
Ricci Picciloni Daniele (Rosetti)	5/28/25, 8:59:56 AM	5/28/25, 112h 43m 36s
Hamish Forsythe (Esterno)	5/28/25, 9:00:12 AM	5/28/25, 112h 43m 12s
Jeroen van Loon (Esterno)	5/28/25, 9:01:19 AM	5/28/25, 112h 42m 11s
Alessandro Balzarotti (Esterno)	5/28/25, 9:02:25 AM	5/28/25, 112h 41m 4s
Jan Duinhoven (Esterno)	5/28/25, 9:11:24 AM	5/28/25, 112h 32m 4s
Nicolas Le Brun (Esterno)	5/28/25, 9:50:29 AM	5/28/25, 111h 52m 55s
Veen, Marcel E SIEPBV-DRN/E/XN4 (Esterno)		

3. Attività di riunione

Nome	Ora di partecipazione	Ora di uscit Durata
Ricci Picciloni Daniele (Rosetti)	5/28/25, 8:59:56 AM	5/28/25, 112h 43m 36s
Hamish Forsythe (Esterno)	5/28/25, 9:00:12 AM	5/28/25, 112h 43m 12s
Jeroen van Loon (Esterno)	5/28/25, 9:01:19 AM	5/28/25, 112h 42m 11s
Alessandro Balzarotti (Esterno)	5/28/25, 9:02:25 AM	5/28/25, 112h 41m 4s
Jan Duinhoven (Esterno)	5/28/25, 9:11:24 AM	5/28/25, 112h 32m 4s
Nicolas Le Brun (Esterno)	5/28/25, 9:50:29 AM	5/28/25, 111h 52m 55s

Annex 3 Hazard Guidewords

GUIDING WORDS for hazards identification

Workplaces

Stability and solidity of the structures; Internal and external circulation routes; Emergency routes and exits; Stairs; Microclimate; Natural and artificial lighting; Rest areas and meals; Dressing rooms and closets for clothing; Sanitary assistance services; activities in confined environments or suspected pollution risks; Work at height.

Service facilities

Electrical equipment, electronic equipment; Heating, air conditioning, conditioning and refrigeration systems; Water and sanitary installations; Gas distribution and utilization plants; Lifting systems (lifts, hoists, lifting platforms).

Work equipment

Pressure apparatus and installations; Fixed thermal plants and appliances; Lifting, transport and material handling systems; Air treatment and filtering suction plants; Above-ground fuel tanks at atmospheric pressure; LPG tanks; Portable, electric or petrol-powered tools; Portable welding apparatus; Transportable heat apparatus; Lighting equipment; Transportable generators; Transportable pressure equipment; Construction machinery; Hand tools.

Atmospheric lightening

Physical agents

Noise; Vibration; Electromagnetic fields; Artificial optical radiation.

Ionizing radiations

Alpha, beta, gamma rays.

Hazardous substances

Chemical agents (including dusts); Carcinogens and mutagens; Asbestos.

Biological agents

Viruses, bacteria, cell cultures, microorganisms, endoparasites.

Explosive atmospheres

Presence of explosive atmosphere (due to flammable substances in the state of gases, vapors, mists or dusts).

Fire

Presence of combustible, flammable substances (solid, liquid or gaseous) and ignition conditions (open flames, sparks, hot parts, etc.).

Organizational factors, special conditions

Work-related stress; Night work, overtime, solo work in critical conditions.

Work under voltage and near active parts of plants