Base Load Power Hub (BLPH)

DAVIT CRANE

SHIPPING, HANDLING, STORAGE AND PRESERVATION PROCEDURES

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ROSETTI MARINO

1	APPROVED - WORK MAY PROCEED
2N	REVISE AND RE-SUBMIT - DO NOT PROCEED
2Y	REVISE AND RE-SUBMIT - WORK MAY PROCEED
3	REJECTED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date

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REMAZEL ENGINEERING

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Revision / Change Log

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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.

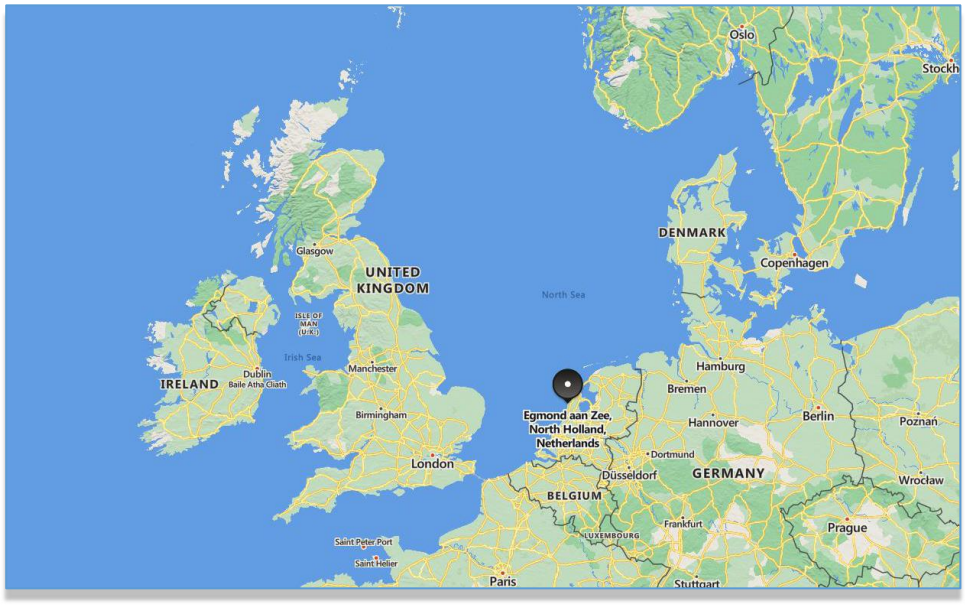


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



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.

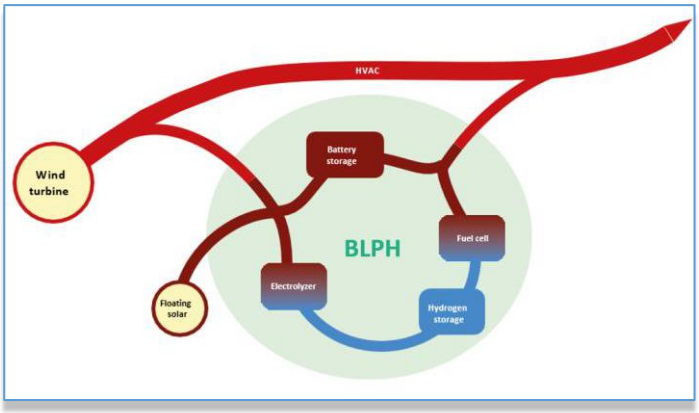


Figure 3 – BLPH Concept

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.

2 DOCUMENT SCOPE

The purpose of this procedure is to prevent or avoid damage to objects, materials, or specimens when such damage has the potential to adversely affect them, and it defines quality requirements related to the handling, packaging, storage, and shipment of davit crane.

2.1 REFERENCES

Doc. No.	Description
123A90-DDL-MAC-SP-50034_00	Technical Specification for DAVIT CRANE

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

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

Table 2 - Definitions and Abbreviations

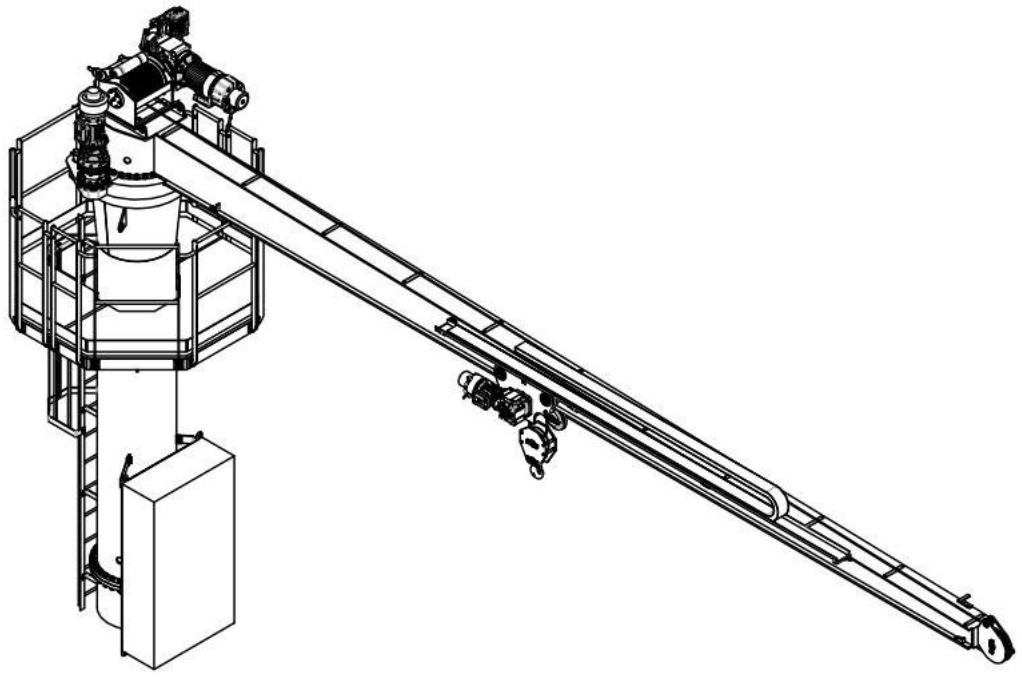
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BASE LOAD POWER HUB (BLPH) DAVIT CRANE C09-0001

JOB 24-27012

SHIPPING, HANDLING, STORAGE and PRESERVATION PROCEDURES



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00	First issue	IZA	MTO	30/09/2024
Rev.	**Modify description**	**Issue**	**Approval**	**Date**

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00	30/09/2024	All	First Issue	For information
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1. Warranty and liability

ATTENTION: The non-observance of the Shipping and Storage Procedure described here below results in voiding the warranty and relieves Remazel Engineering S.p.A. from any liability in case of machines malfunctioning.

2. Equipment delivery conditions

The crane will be delivered at sight and in wooden boxes, components at sight will be protected with tectyl.
The electrical cabinet will be delivered in seaworthy wooden box, minor components such as bolts, nuts and/or carters will be packed in wooden case.

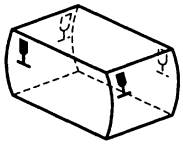
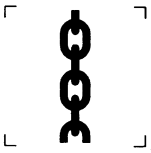
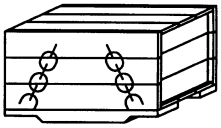
3. Marking

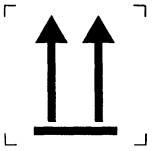
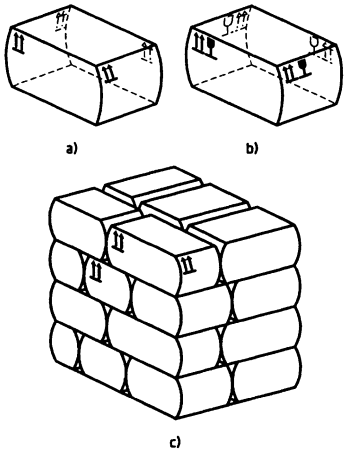
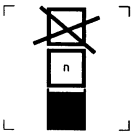
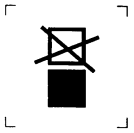
3.1. Shipping marks

Shipping marks and packing lists will be applied on all items, according to project specific requirements.

3.2. Handling symbols

Here below is reported the whole list of the marking from the European standard ISO 780; for the packaging only the applicable ones to this specific shipment have been considered.

No.	Instruction/ Information	Symbol	Meaning	Reference/Remarks
1	FRAGILE		Contents of the transport package are fragile therefore it shall be handled with care.	Example of application: 
2	SLING HERE		Slings shall be placed where indicated for lifting the transport package.	Example of application: 

No.	Instruction/ Information	Symbol	Meaning	Reference/Remarks
3	THIS WAY UP		Indicates correct upright position of the transport package.	Example of application: 
4	STACKING LIMIT BY NUMBER		Maximum number of identical packages which may be stacked on one another, where “n” is the limiting number.	
5	DO NOT STACK		Stacking of the transport package is not allowed and no load should be placed on the transport package.	

3.3. Protections

The equipment is designed to work on open deck and subjected to a special coating process to prevent the corrosion, tectyl protection will be applied.

4. Handling

The complete crane is loaded on trucks from Remazel Engineering premises in Via Caboto – Trieste (TS) and delivered DAP in Marina di Ravenna. The packing is foreseen to protect the crane during transportation.
Handling and lashing needs to be performed as follows to avoid damaging the paint.
All handling shall be done in such a manner to avoid clashing and/or damage to the parts, i.e. they shall not be dropped or impacted against other objects and to protect the coating from damage.
Use of ropes, chains or cables is not permitted. Hooks on lifting points, shackles, rubber or nylon belts shall be allowed for lifting, lowering or suspending the items.
Once loaded for transport, the crane shall be lashed to avoid scratches and to prevent hitting. Non-abrasive and non-metallic supports, wooden boards, pallets, mats or rubber strips shall be used.
Boxes can be handled also with forklifts or ropes.

5. Storage and unpacking precaution

The crane is designed to work on open deck and subjected to a special coating process to prevent the corrosion, tectyl is added to protect the crane.

If the crane shall be stored is advisable to keep it off the ground on sufficiently padded skids, properly levelled and spaced. If the crane is to be stored in open port setting, we suggest covering it with tarpaulins.

The crane as shipped can be safely stored, in respect to the above indication, for up to 3 months.

After 3 months the seaworthy package that contains the electrical cabinet must be restored and the crane shall be re-greased.

Unpacking shall be done right before the installation in order to ensure that all the components are undamaged.

Preservation after offshore installation will be covered in the O&M manual.