Base Load Power Hub (BLPH)

PACKING, HANDLING, SHIPPING, PRESERVATION AND STORAGE PROCEDURES

MANUAL VALVES – GATE, GLOBE, CHECK

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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.

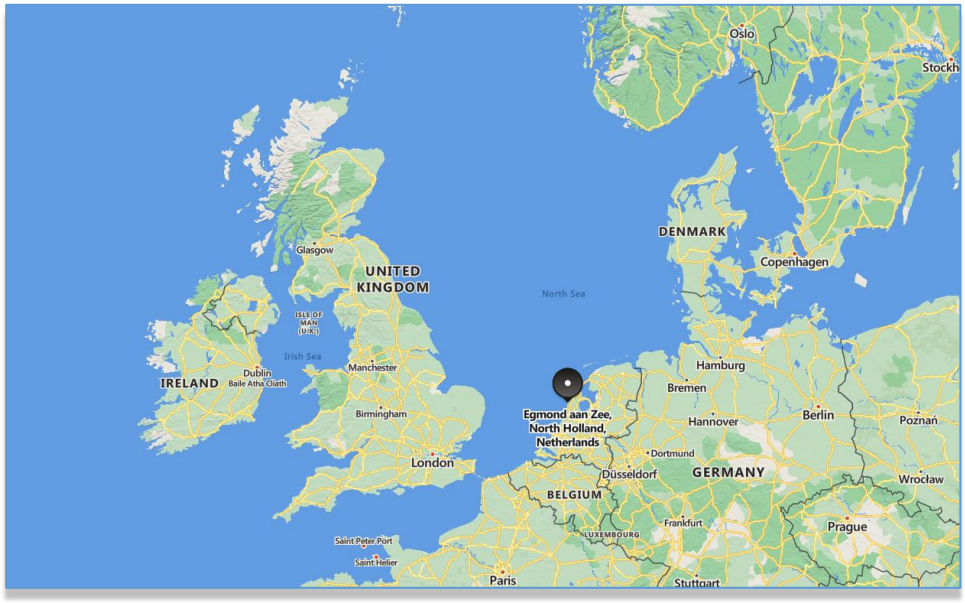


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



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.

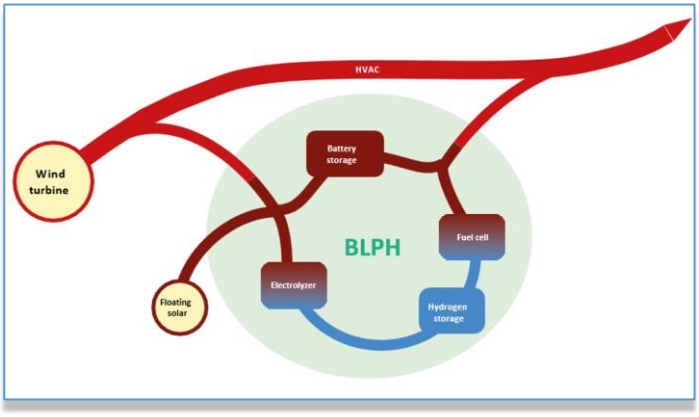


Figure 3 – BLPH Concept

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: PACKING AND SHIPMENT MANAGEMENT

The document's scope is to define packing instructions.

2.1 REFERENCES

Doc. No.	Description
123A90-DDL-PP-SP-70000	Piping Material Classes
123A90-DDL-PP-DS-70003	Manual Valve Data Sheets
Appendix 1 extracted from doc. 123A90-DDL-PP-LIS-70002	Gate, Globe & Check Valves MTO
123A90-DDL-PP-SP-70030	TSS - Manual Valves & Strainers
1724000799-QC-DB-00008	Factory acceptance test procedure
1724000799-QC-ITP-00002_00	Inspection and test plan

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

3 SCOPE AND APPLICATION RANGE

This procedure illustrates the manner in which F.R.I. organizes and performs the Shipment.

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4 REFERENCES

- UNI EN ISO 9001:2015 § 8.5.4;
- Quality Manual § 8.5.4;
- Procedure PG 8.5 – Production Management.
- Procedure PG 8.5.4 – Preservation of the Product.
- ISPM 15

5 RESPONSIBILITY

The Quality Control Representative are responsible for ensuring compliance with the requirements of this procedure.

6 ACTIVITY DEFINITION

The activity of shipping includes:

- Packaging activities;
- Preparation of shipping documents;
- Shipping activities including the load of the transport vehicle.

7 PACKING

7.1 GENERAL INFORMATION

The activity of packing aims to ensure continuing compliance during handling, transport and storage of the product.

The products or materials to be shipped are delivered to the Warehouse (F.R.I. or qualified supplier), identified and provided with the required production documents.

F.R.I. verifies and ensures the overall compliance of the product and the proper identification prior to shipment.

The goods are packaged as agreed with the Customer at the contracting stage.

When contractually not defined, the standard applied by F.R.I. provides that:

a) material, after having successfully passed the final inspection, is subjected to conditions appropriate to its characteristics;

b) the machined parts of the valves are covered protective oil to protect them from rust;

c) adequate protection (see next paragraph) are applied at the ends of the valve to prevent the passage of dust or other foreign bodies;

d) adequate protections are applied to the valve as a whole to prevent the passage of dust or other foreign bodies;

e) appropriate protections against impacts during loading and transportation is prearranged at the valves' ends;

f) appropriate protections are applied to prevent the impacts of the whole valve during loading and transportation.

g) the product is normally prepared on pallets with plastic cover (no water proof resistant). NOTE: the package in pallet is not stackable and is not equipped with angles.

h) Packaging shows in a legible form at least the main data to ensure recipient and good identification

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7.2 DETAIL OF PACKING

CLOSING OF FLANGES

Closing caps are applied to the ends of the valve flanges to protect them from direct impact and preserve the integrity of the surfaces and internal components. As an alternative, a protective spongy film is sticked to the ends of the valve flanges. Per API 6D valves, the design of the covers shall prevent the valves from being installed unless the covers have been removed. Flanged and welding ends shall be blanked off to protect the gasket surfaces, welding ends, and valve internals during shipment. Protective covers shall be made of wood, wood fiber, plastic, or metal and shall be securely attached to the valve ends by using bolting/nuts, plastic straps, steel clips, or friction-locking devices. Protective covers made of wood or wood fiber shall be fitted with a nonporous moisture barrier between the cover and the metal flange or welding end. All flanged end and weld end protective covers installed on the valves shall be sealed using a rubberized waterproof

Tape.

Plug, ball, and reverse-acting through-conduit gate valves shall be shipped in the fully open position, unless fitted with a fail-to-close actuator. Other gate valve types shall be shipped with the gate in the fully closed position. Check valves NPS 4 (DN 100) and larger shall be shipped with the disc secured or supported during transport. A warning label shall be attached to the protective cover with instructions to remove, prior to installation, material from inside the valve that secures or supports the disc. Valves shipped with stem extensions and without an operating mechanism shall have the annular space closed and the stem extension secured to the outer housing.

PALLET

The pallets are divided into standard pallet (120X80) and custom pallets.



WOODEN BOX

Wooden containers (boxes and crates) are suitable for transport by land and sea, sized and structured to preserve the integrity of the goods to destination.



INTERNAL STRUCTURE AND WOOD SUPPORTS

The support structure and locking of the valve and its components (e.g. actuator) inside the case is made of elements in cross section of 100x100mm and variable length according to the needs (size of the box, etc.)



BARRIER BAG

The materials used meets requirements of MIL standards B.131.G class 1. The application of the barrier bag allows for valve protection from moisture and therefore oxidation. The product is vacuum packed and heat-sealed barrier bag ensures sealing up.



DESSICANT SALTS

A desiccant bag is placed in the heat-sealed bag to reduce any excess moisture. The amount of the salt placed inside the packaging is proportional to its duration.

According to the formula Q = (P X S X T)/80

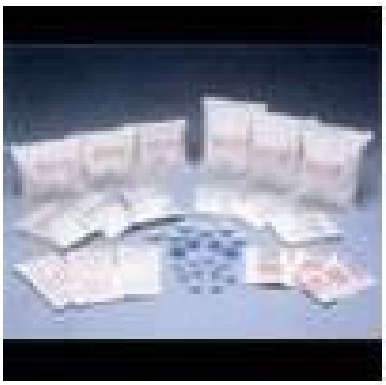
Where:

Q = amount of salt

P = Permeability barrier of the bag (F.R.I. standard: 0,05)

For humid climates (e.g. tropical), the amount of salt can be also

5 times higher.



7.3 WOODEN PACKAGES

The packaging is suitable to protect the goods against atmospheric agents, physical damages, humidity, vapor, outside temperature, extreme temperatures, contamination in the air, gravitational forces, handling, stacking.

The packaging guarantees protection of goods during the land/overseas transport and external storage for a period of approximately 12 months with not severe environmental condition (such as constant rain, snow, extreme temperatures, etc.). During transportation or storage, maximum 2 boxes can be piled up (3 if not weighing more than 500kg each). Materials packed in wooden boxes are properly secured to the base in order to prevent any movement during all phases of transport.

The packages are solid wood with no harmful insects and, according to ISPM 15 (International Standards for Phytosanitary Measures), are to be fumigated and marked by a stamp or brand, internationally recognized, to attest phytosanitary status. The international codes are applied on both sides of the packages.

When plywood boxes are used no fumigation certificate according to ISPM 15 is needed.

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Minimum thickness of planks:

NET WEIGHT NOMINAL	TICKNESS MIN.
< 1000 kg	25 mm.
1001 – 3000 kg	30 mm.
> 3001 kg	40 mm.

The width of the boards is always 10 mm at least.

BOX HANDLING

The lifting up points can be shown on boxes



8 IDENTIFICATION

The identification of the packaging follows the contractual requirements.

If not defined, the standard F.R.I. provides that:

- The packing of valves or components shipped are marked with labels and contain at least the following information:
  - Recipient
  - Job number
  - Quantity
  - Brief description of the goods included.
- Spare parts packages are individually marked with indelible labels to allow easy identification.

9 SHIPPING

9.1 INCOTERMS CONDITIONS

The following table summarizes the transportation conditions in accordance with INCOTERMS.

SERVICE	EXW	Free			Carriage				Delivery				
	EXW	FCA	FAS	FOB	CFR	CIF	CPT	CIP	DAF	DES	DEQ	DDU	DDP
Loading	C	F	F	F	F	F	F	F	F	F	F	F	F
Export – duty payment	C	F	F	F	F	F	F	F	F	F	F	F	F
Transport to exporter's port	C	F	F	F	F	F	F	F	F	F	F	F	F
Unload from truck at the origin's port	C	C	F	F	F	F	F	F	F	F	F	F	F
Landing charges at origin's port	C	C	C	F	F	F	F	F	F	F	F	F	F
Transport to import's port	C	C	C	C	F	F	F	F	F	F	F	F	F
Landing charges at importer's port	C	C	C	C	C	C	C	C	C	C	F	F	F
Unload onto trucks from the importers' port	C	C	C	C	C	C	C	C	C	C	C	F	F
Transport to destination	C	C	C	C	C	C	C	C	C	C	C	F	F
Insurance	C	C	C	C	C	F	C	F	C	F	F	F	F
Entry – Custom clearance	C	C	C	C	C	C	C	C	C	C	C	C	F
Entry – Duties and Taxes	C	C	C	C	C	C	C	C	C	C	C	C	F

Legend:

- F = charged to F.R.I.
- C = charged to the Customer
- EXW – Ex Works (agreed place)
- FCA – Free Carrier (agreed place)
- FAS – Free Alongside Ship (agreed loading port)
- FOB – Free On Board (agreed loading port)
- CFR – Cost and Freight (named destination port)
- CPT – Carriage Paid TO (destination place)
- CIP – Carriage and Insurance Paid (destination place)
- DAF – Delivered At Frontier (place)
- DES – Delivered Ex Ship (port)
- DEQ – Delivered Ex Quay (port)
- DDU – Delivered Duty Unpaid (destination place)
- DDP – Delivered Duty Paid (destination place).

9.2 SHIPPING DOCUMENTATION

The Shipping Dept. prepares the enclosed documents for transportation, such as:

ITALIA:

- DDT (Italian Shipping Document)
- Packing List

UE

- Accompanying Invoice
- Packing List
- CMR (International Consignment Letter)

Extra UE

- Invoice
- Packing List
- Other documentation (e.g. certificate of origin, etc.) as indicated by the Country of destination.

9.3 LOAD HANDLING

For proper and safe handling of loads, see the internal operating instructions on the appropriate handling

9.4 SHIPMENT LOADING

The loading of products on vehicles is performed as required by national and international transport regulations.

Loading, covered as a rule, is placed and fixed to avoid any damage to the product or any safety risk to people.

The possibility to issue particular specifications defining the terms for shipping and delivery is evaluated in case of products with particular bulk or weight characteristics, or specific contractual requirements.

The loading and shipping are managed by F.R.I. Administration which takes care of transportation requests with qualified carriers.

The shipping documentation is managed by F.R.I. Administration which also deals with the following copies filling.

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