Base Load Power Hub (BLPH)

INSTRUMENT AIR PACKAGE A-63000

MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - INDEX

Document Number: 1724000428-QC-LIS-00026

Document Class: 2

01	05/02/2025	Issue for Review (IFR)	GT	MC	TM
00	02/01/2024	Issue for Review (IFR)	GT	MC	TM
Rev.	Date	Description	Prepared	Reviewed	Approved

COES

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

Revision / Change Log

Rev.	Description
00	Issue for Review (IFR)
01	Issue for Review (IFR)

HOLDS LIST

No.	Description
1	
2	
3	
4	

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

Table of contents

1 INTRODUCTION 5

1.1 PROJECT OVERVIEW 5

1.1.1 Project Location 5

1.1.2 Project Concept 6

2 DOCUMENT SCOPE 8

2.1 REFERENCES 8

2.2 DEFINITIONS AND ABBREVIATIONS 8

3 INDEX 9

3.1 Design Dossier 9

3.1.1 Lists 9

3.1.2 Diagrams 9

3.1.3 Drawings 9

3.1.4 Calculation notes 9

3.1.5 Data sheets 9

3.2 Certification Dossier 10

3.2.1 Manufacturing procedures 10

3.2.2 Manufacturing records 10

3.2.3 Package certification 10

3.3 field operations & MAINTENANCE 10

3.3.1 General documents 10

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

List of Figures

Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map 5

Figure 2 - Wind Park Details 6

Figure 3 – BLPH Concept 6

List of tables

Table 1 - Reference Documents.....8

Table 2 - Definitions and Abbreviations 8

List of Attachments

None

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

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.

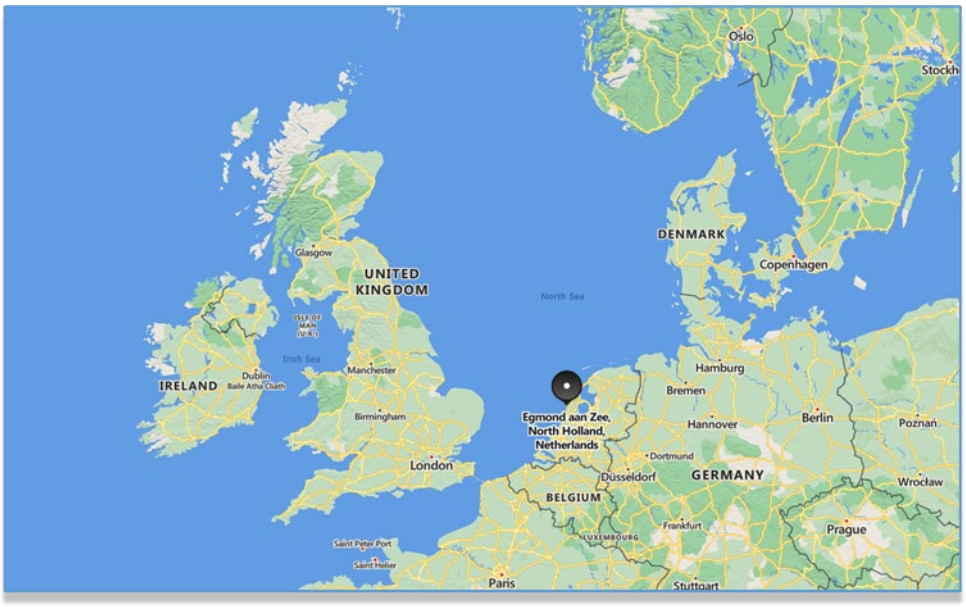


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



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.

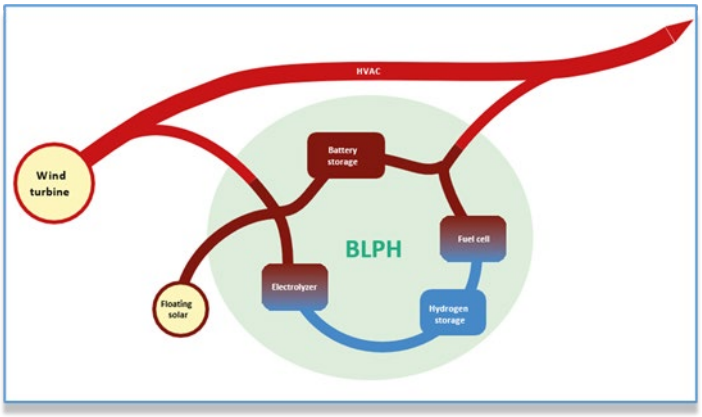


Figure 3 – BLPH Concept

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.

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

2 DOCUMENT SCOPE

This document identifies any electrical equipment to be fed with its main characteristics.

2.1 REFERENCES

Doc. No.	Description
1724000428-MD-LIS-00001	SMIR - SUPPLIER MASTER INFORMATION REGISTER

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

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

3 INDEX

3.1 DESIGN DOSSIER

3.1.1 Lists

- 1724000428-MD-LIS-00001: SMIR - SUPPLIER MASTER INFORMATION REGISTER
- 1724000428-EL-LIS-00015: ELECTRICAL LOAD LIST
- 1724000428-IN-LIS-00016: I/O LIST
- 1724000428-IN-LIS-00017: INSTRUMENT LIST WITH SET POINTS/CONTROL/ALARM/SHUTDOWN
- 1724000428-EL-LIS-00018: CABLES LIST
- 1724000428-MAC-LIS-00027: ATEX REGISTER
- 1724000428-MAC-LIS-00028: ATEX DOCUMENTATION

3.1.2 Diagrams

- 1724000428-PR-PID-00019: PACKAGE P&ID

3.1.3 Drawings

- 1724000428-MAC-DA-00005: CERTIFIED PACKAGE GENERAL ARRANGEMENT AND DIMENSIONAL OUTLINE DRAWINGS (INCLUDING : NAMEPLATE, BASEFRAME, FOUNDATION LOADS, NOZZLES LOADS, NOZZLES LIST, BATTERY LIMITS, CoG)
- 1724000428-MAC-DD-00006: EQUIPMENT SECTIONAL DRAWING WITH BILL OF MATERIAL
- 1724000428-MAC-DD-00008: PACKAGE PIPING SCHEMATICS AND BILL OF MATERIALS
- 1724000428-MAC-DG-00009: PACKAGE WIRING DIAGRAM INCLUDING LAYOUT OF PACKAGE CONTROL PANEL
- 1724000428-MAC-CE-00004: PACKAGE CAUSE EFFECT MATRIX/LOGIC DIAGRAMS

3.1.4 Calculation notes

- 1724000428-ST-RE-00010: PACKAGE STRUCTURAL CALCULATION REPORT INCLUDING FIXING POINTS and LIFTING POINTS
- 1724000428-MAC-CA-00032: AIR RECEIVER CALCULATION

3.1.5 Data sheets

- 1724000428-MAC-DS-00011: EQUIPMENT DATA SHEETS INCLUDING MOTORS, AIR COMPRESSOR, DRYERS, ETC.
- 1724000428-MAC-DS-00012: PACKAGE EQUIPMENT NOISE DATA SHEETS INCLUDING AIR COMPRESSOR, DRYERS, ETC.
- 1724000428-MAC-DS-00013: INSTRUMENT DATA SHEETS
- 1724000428-MAC-DS-00014: AIR COMPRESSOR PERFORMANCE CHART

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as “NOT CONTROLLED” copy

3.2 CERTIFICATION DOSSIER

3.2.1 Manufacturing procedures

- 1724000428-QC-ITP-00002: INSPECTION TEST PLAN (ITP)
- 1724000428-WEL-LIS-00021: WELDING BOOK (WPS, PQR, WELDERS QUALIFICATIONS, WELDING MAPS, ETC.)
- 1724000428-NDT-PRO-00020: NDT PROCEDURES INCLUDING PERSONNEL QUALIFICATIONS
- 1724000428-MAT-PRO-00022: PAINTING PROCEDURE
- 1724000428-QC-PRO-00023: HYDROSTATIC AND OR PNEUMATIC TEST PROCEDURE
- 1724000428-QC-PRO-00024: FAT (FACTORY ACCEPTANCE TEST) PROCEDURE
- 1724000428-QC-PRO-00031: HANDLING, PRESERVATION AND PACKAGING PROCEDURE

3.2.2 Manufacturing records

- NDT RECORDS & PERSONNEL QUALIFICATONS
- PAINTING RECORDS
- HYDROSTATIC TEST RECORDS
- MATERIALS TEST CERTIFICATES (EN 10204 3.1)
    - BASEFRAME (MAIN BEAMS)
    - PIPING
    - PRESSURE VESSELS
    - VALVES
    - INSTRUMENTATION
- FAT REPORT

3.2.3 Package certification

- PED CERTIFICATION
- EC DECLARATION OF CONFORMITY
- PERFORMANCE TEST REPORT

3.3 FIELD OPERATIONS & MAINTENANCE

3.3.1 General documents

- 1724000428-MAC-SP-00003: SYSTEM/PACKAGE FUNCTIONAL DESCRIPTION
- 1724000428-COM-LIS-00029: SPARE PARTS LIST (2 YEARS AND COMMISSIONING & START-UP)
- 1724000428-MAC-MAN-00030: INSTALLATION, OPERATING AND MAINTENANCE MANUAL (INCLUDING SITE ERECTION INSTRUCTIONS AND PROCEDURES)

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as “NOT CONTROLLED” copy