Base Load Power Hub (BLPH)

FINAL DOSSIER PROCEDURE

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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.

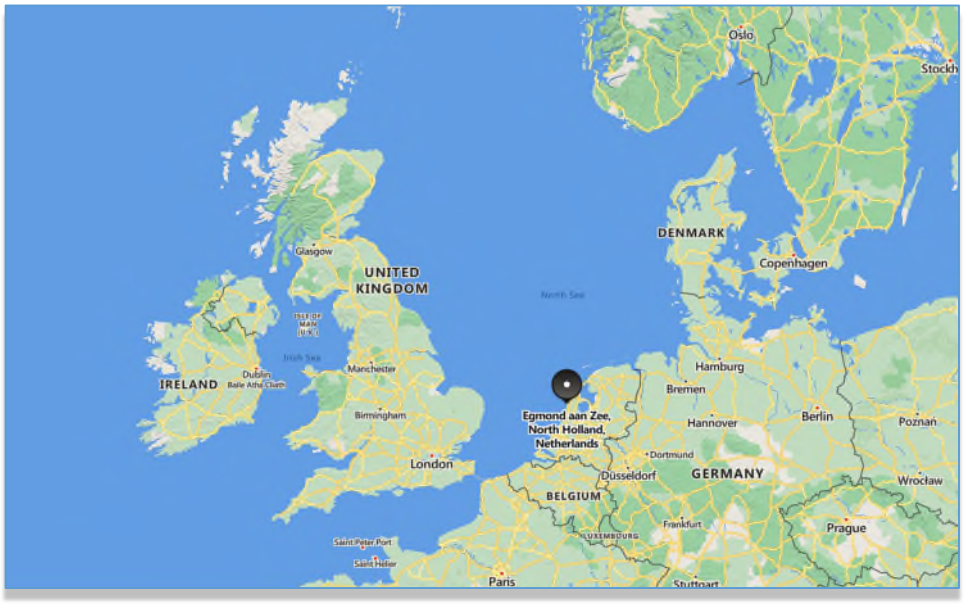


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map

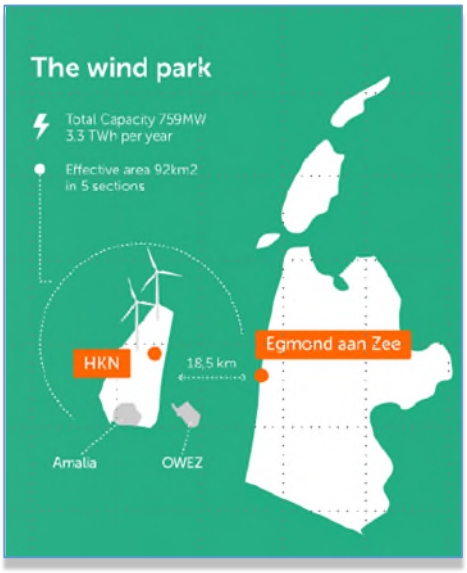


Figure 2 - Wind Park Details

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.

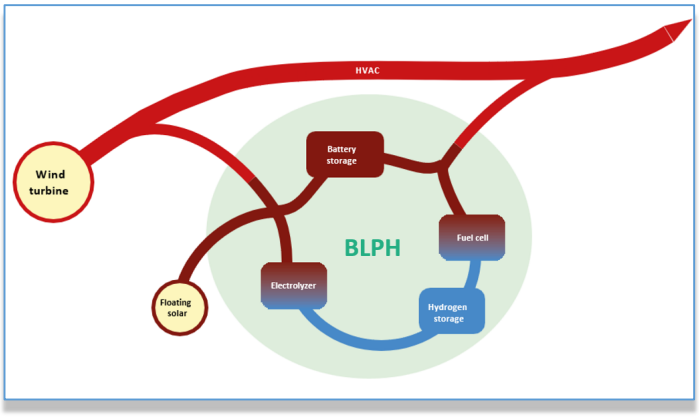


Figure 3 – BLPH Concept

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 PURPOSE

The primary objective of this procedure is to establish a comprehensive framework for the preparation of the final dossier. This dossier is intended to gather all relevant project documentation in a structured and organized manner. It outlines the specific guidelines, standards, and methodologies to be followed to ensure that the documentation is complete, accurate, and presented in a format that meets both internal and external requirements. This includes the identification of necessary documents, the review and approval process, and the final compilation and submission of the dossier.

3 SCOPE

This procedure is specifically issued and implemented for the Base Load Power Hub (BLPH) project, undertaken for Crosswind.

4 REFERENCES

Doc. No.	Description
CW-I-WP4-2023-05	CONTRACT
CONTRACT SECTION V	SCOPE DESCRIPTION
CONTRACT SECTION IX	QUALITY_MANAGEMENT
123A90-PML-QHSE-QP-00002	PROJECT QUALITY PLAN

Table 1 - Reference Documents

4.1 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project
PLANT:	Base Load Power Hub (BLPH)
VENDOR OR SUPPLIER	Any organization employed by Rosetti Marino to supply either products or services.
Inspection and Test Plan (ITP)	Document, which identifies the activities to be inspected as well as specifications, methods and acceptance criteria for monitoring and/or testing. It is a synonymous of "Quality Control Plan" (QCP)
Detail Design	Structural design by TECON (TE); Civil, Structural and Architectural; Instrumentation, Automation and Electrical, Piping and Layout; Technical Safety and Environmental

	Studies; Mechanical, Process, 3D modelling by Rosetti Marino S.P.A in Milan (RM).
FUSIONLIVE	Contractor Electronic Document Management System.
MDR	Master Document Register
DDL	Design Document List
SDL	Supplier Document List
FDL	Fabrication Document List
CPI	Company provided Items

Table 2 - Definitions and Abbreviations

5 RESPONSABILITIES

Project Engineering Team:

- Responsibilities of Project Engineer Manager (PEM) and team:
  - Prepare a complete set of the latest issues of Engineering documents,
  - Ensure these documents are ready for inclusion in the Final Documentation.

Pre-commissioning and Commissioning Team:

- Responsibilities of the Commissioning Manager (COMM) and team:
  - Prepare and implement the Pre-commissioning and Commissioning Dossier.
  - Ensure the dossier is ready for inclusion in the Final Documentation.

Quality Management team:

- Responsibilities of Project QC Coordinator:
  - Ensure that all control reports are issued and properly compiled.
  - Provide evidence of activities planned and defined in the Inspection Test Plans (ITPs).
  - Coordinate with the Project Quality Manager (PQM) to ensure quality documents meet project requirements and are ready for inclusion in the Final Documentation.
- Responsibilities of Project Quality Manager (PQM):
  - Verify the proper preparation and collection of all documents from engineering, manufacturing, fabrication, pre-commissioning, and commissioning phases.
  - Arrange the documents according to the specified procedure.
  - Submit the Final Documentation Dossiers to the Client

6 OVERALL STRUCTURE OF FINAL DOCUMENTATION DOSSIER

The table hereafter summarizes the basic requirements regarding the overall structure of the documents and records which altogether comprise the FINAL DOCUMENTATION DOSSIER:

VOLUME	*CONTENT*
Volume 0	*Main Index of Final Documentation Dossier*
Volume 1	*Deliverables Dossier*
Volume 2	*Fabrication and Certification Dossier*
Volume 3	*MC and Commissioning Dossier*
Volume 4	*Vendor´s Manufacturer Record Book*
ANNEXE 1	*Native Files of Project Documents*
ANNEXE 2	*Final dossiers of CPI's*

6.1 VOLUME 0 – CONTENTS AND MAIN INDEX OF THE FINAL DOCUMENTATION DOSSIER

Volume 0 contains a detailed index of the contents of each section within Volumes 1 to 4. It is a comprehensive guide for locating specific parts of the dossier and identifying the appropriate folder where they are stored. The index for each individual Dossier serves as the initial Section 0, including:

Sub-indexes or registers will provide precise locations (by section or binder and section) for detailed information and data, as determined by the significance of the documentation.

The Main Index of the Final Dossier must be submitted for approval to the COMPANY.

6.2 VOLUME 1 - CONTENTS OF DELIVERABLES DOSSIER

This volume of the final dossier consolidates all documents outlined as deliverables in accordance with the contractual agreement, as listed in the Master Document Register. Each document has been updated to its latest revision and bears the approved status denoted by code 1. Every document related to the PLANT's design and engineering, including all systems, sub-systems, units, and associated components, is included in the Deliverable Dossier. The objective is to comprehensively describe each aspect in its final as-built or as-delivered condition. To achieve this, the dossier details technical specifications, design drawings, calculations, material certifications, and any modifications or deviations from the original design. Additionally, it includes operational and maintenance manuals that reflect the final configuration of the PLANT. This thorough documentation ensures that the Deliverable Dossier is a definitive reference for the PLANT's construction, facilitates future maintenance, and supports any modifications or expansions.

6.3 VOLUME 2 - CONTENTS OF FABRICATION & CERTIFICATION DOSSIER

This volume must include all reports, certificates, documents, and quality records. Its purpose is to provide a detailed record of all activities undertaken and to demonstrate the complete compliance of the PLANT, including all systems, sub-systems, units, and components, with the relevant SPECIFICATIONS and all applicable statutory and regulatory requirements. This documentation should reflect the final as-built or as-delivered state of the project. The dossier represents a thorough collection of all Quality Records documents, including Certifying Authorities and Third-Party certificates for each discipline, forming the overall Certification Documentation. It also includes information regarding activities performed to deliver the project or modification, classified by phase (construction, transportation, installation, hook-up), forming the overall PLANT Fabrication and Installation documentation part.

6.4 VOLUME 3 - MC AND COMMISSIONING DOSSIER

Volume 3 of the documentation must encompass all procedures and records pertaining to activities conducted during the Mechanical Completion, Pre-commissioning, and Commissioning phases of the PLANT. This volume should serve as an exhaustive archive, detailing every step and process undertaken to ensure the PLANT's readiness for operational service. It must include, but is not limited to, checklists, test results, certifications, and any adjustments or modifications made during these critical stages. The purpose of this volume is to provide a clear, comprehensive, and traceable account of the progression towards the PLANT's operational capability, affirming that all components and systems meet the specified standards and requirements.

6.5 VOLUME 4 - CONTENTS OF VENDOR MRB

MRB shall be required for each supplier. Every single dossier consists of a comprehensive compilation of all as-built information, certifications, etc. arranged according to the guidelines specified in the document 123A90-PML-QHSE-PRO-00113 VENDOR FINAL DOCUMENT REQUIREMENTS & MANAGEMENT.

6.6 ANNEXE 1: NATIVE FILES OF PROJECT DOCUMENTS

This annexe contains all the native files of the documents issued for the project. These files are organized following the same structure as the general index. This consistent organization ensures that the client can easily locate and reference the original files corresponding to each document in the dossier. Providing native files enhances the client's ability to interact with and manipulate the data as needed, ensuring full utility of the project documentation.

6.7 ANNEXE 2: DOSSIERS OF COMPANY PROVIDED ITEMS

This annexe contains the dossiers of the company provided items. Rosetti will include these dossiers in this annexe exactly as received from the client. No verification of the content or compliance with project requirements will be performed by Rosetti, as this responsibility lies solely with Crosswind. This procedure ensures that all items provided by the company are documented and included in the final dossier.

7 VOLUMES CONTENT

7.1 VOLUME 1- DELIVERABLES DOSSIER

SECTION	*CONTENT*
0	Main index of Final Dossier for Volume 1
1	Architectural
2	Commissioning
3	Construction
4	Digital
5	Electrical
6	Field E&I
7	HVAC
8	Instrumentation
9	Mechanical
10	Material and Corrosion
11	Multidisciplinary
12	Marine Operations
13	Methods
14	Operation and Maintenance
15	Project Management
16	Piping
17	Process
18	Procurement
19	Quality and HSE Management
20	Technical Safety
21	Structures
22	Structures Jacket
23	Transportation and Installation
24	Telecommunication
25	Welding

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7.2 VOLUME 2 – FABRICATION AND CERTIFICATION DOSSIER

SECTION	*CONTENT*
0	Main index of Final Dossier for Volume 2
1	NCR, Concession/Deviation and Technical Queries Requests - Non-Conformity List - Non-Conformity Reports - Supply Non-Conformity List - Supply Non-Conformity Reports - Concession/Deviation Requests List - Concession/Deviation Requests - Technical Queries List - Technical Queries Requests
2	Structure Fabrication & Certification Dossier - Structure Material Traceability reports - Structure Material Certificates (divided by PO) - Structure Material Traceability for Deck/Grillage & Seafastening - Structure Material Certificates (divided by PO) - Structure Welding and NDT register - Structure NDT reports (divided by method/type) - Structure Welding and NDT register for Deck - Structure NDT reports (divided by method/type) - Structure Welding and NDT register for Deck Grillage and Sea-fastening - Structure NDT reports (divided by method/type) - Structure Dimensional Check Reports - Structure Weight Report
3	Piping Fabrication & Certification Dossier - Piping Material Traceability reports - Piping Material Certificates (divided by PO) - Piping Welding and NDT register - Piping NDT reports (divided by method/type)

	- Piping NDT personnel list with qualifications - Piping Repair Reports - Piping Dimensional Check Reports - Piping Hydrotesting/Flushing/Reinstatement Reports - Piping Painting Reports - Piping Leak Test Report - Piping PED Dossier

7.3 VOLUME 3 – MECHANICAL COMPLETION AND COMMISSIONING DOSSIER

SECTION	*CONTENT*
1	MC and Commissioning for System 20 – Electrolyser
2	MC and Commissioning for System 25 – Hydrogen Storage
3	MC and commissioning for System 43 – Hydrogen Vent System
4	MC and commissioning for System 50 – Fresh Water Systems
5	MC and commissioning for System 55 – Wastewater
6	MC and commissioning for System 56 – Open Drain System
7	MC and commissioning for System 63 – Instrument Air
8	MC and commissioning for System 64 – Nitrogen System
9	MC and commissioning for System 70 – Safety and Facility Systems
10	MC and commissioning for System 72 – Electrical - Telecom - Instrumentation
11	MC and commissioning for System 76 – Escape & Personnel Safety
12	MC and commissioning for System 77 – Heating & Ventilation
13	MC and commissioning for System 79 – Emergency Shutdown systems
14	MC and commissioning for System 80 – Hydrogen Fuel Cell Package
15	MC and commissioning for System 81 – Main Power Distribution High Voltage 66 kV
16	MC and commissioning for System 82 – Main Power Distribution Medium Voltage 6.6 kV
17	MC and commissioning for System 83 – Main Power Distribution Low Voltage 440 V

18	MC and commissioning for System 84 – Battery & No-Break System
19	MC and commissioning for System 85 – Battery Energy and Storage System
20	MC and commissioning for System 86 – Telecommunication
21	MC and commissioning for System 87 – Instrumentation Systems incl. general control room equipment
22	MC and commissioning for System 90 – Structural, Architectural
23	MC and commissioning for System 99 – Miscellaneous System

The mechanical completion dossiers will be included divided into systems and related sub-systems. Both MC and commissioning will include all documents produced according to the indexes as per attachment 1.

7.4 VOLUME 4 – VENDOR'S MANUFACTURER RECORD BOOK

SECTION	*CONTENT*
1	PO No. - Sub vendor's Name
2	PO No. - Sub vendor's Name
3	PO No. - Sub vendor's Name
xx	PO No. - Sub vendor's Name

8 PRESENTATION OF FINAL DOCUMENTATION – REQUIREMENTS

8.1 SOFT COPY

The client will be provided only with a soft copy of the documentation. This approach ensures ease of access and efficient navigation through the documents. The general index will be fully searchable and hyperlinked to the various sections, significantly simplifying the process of finding specific information.

All documents will be delivered in searchable PDF format, allowing for quick keyword searches within the documents. Additionally, all native files (such as Word, Excel, AutoCAD, etc.) will be provided to the client. These native files will be included in an annexe to the final dossier, which will also be organized according to the general index, ensuring consistency and ease of use.

Documents that contain wet signatures will be carefully scanned in colour and saved as PDF files. This ensures that all original signatures are clearly visible and preserved in the electronic version.

The entire dossier, in its electronic format, will be provided to the client on a physical medium such as a hard disk. This hard disk will contain the complete set of documents, both PDFs and native files, organized and indexed for easy access and retrieval. This method not only facilitates the client's ability to manage and

reference the documentation but also ensures that all necessary files are preserved in their original, high-quality format.

CROSSWIND	12A90 – HOLLANDSE KUST NOORD WIND PARK BLPH Project COMMISSIONING DOSSIER INDEX	ROSETTI MARINO

Sub System N°:		TICK AS APPROPRIATE	ONSHORE	
Description:			OFFSHORE	

1. SUB-SYSTEM DEFINITION: 1.1. Sub-System Description / Boundary Limit Drawings		Book ____of____
2. READY FOR OPERATION CERTIFICATE: 2.1. Achievement Of Ready for Operation Certificate (RFO) 2.2. Exception Punch Lists (per discipline) 2.3. "As-Commissioned" P&ID's / SLD's / D&ID's / C&E's		Book ____of____
3. CONSOLIDATED PUNCH LISTS 3.1. Cleared and residual items (sorted by discipline)		Book ____of____
4. FUNCTIONAL TESTS SHEETS: 4.1. Electrical functional test sheets index 4.2. Electrical "As-Commissioned" interconnection diagrams 4.3. Instrumentation Functional Test Sheets Index 4.4. Instrumentation "As-Commissioned" trouble shooting diagrams 4.5. Telecommunication Functional Test Sheets Index 4.6. Telecommunication "As-Commissioned" I.C.D. / TSLD's		Book ____of____
5. SITE / OPERATIONAL: 5.1. Operational Test Procedure 5.2. Operational Test Certificates		Book ____of____
6. PIPING AND VESSEL PREPARATION: 6.1. Final Mechanical / Vessel Inspection Checks Index 6.2. Leak Test / Drying / Inerting Test Sheets Index 6.3. Chemical Loading & First Fill records Index 6.4. Chemical Cleaning Reports and Records Index 6.5. Lubrication Schedule		Book ____of____
7. VENDORS: 7.1. Vendor Package Summary Index 7.2. FAT/SAT Certificate with associated punch list and reference (Front Page) 7.3. Vendor Spares & Special Tools lists references 7.4. Vendor Data / Operations / Maintenance Manuals References		Book ____of____
8. LIST OF MODIFICATIONS 8.1. List of changes initiated during the WORKSITE Commissioning phase pertaining to the relevant Sub-System will be incorporated in this section with relevant references (with location and position of blinds/spades, isolation LO & LC valves, list of electrical isolation status, and remaining inhibits and overrides)		Book ____of____
9. SUPPORTING DOCUMENTS 9.1. Other supporting documents (as applicable)		Book ____of____

	Contractor Commissioning Site Leader	Company Commissioning Site Leader
NAME		
DATE		
SIGNATURE		

CROSSWIND	**123A90 - HOLLANDSE KUST NOORD WIND PARK BLPH Project** **MECHANICAL COMPLETION DOSSIER INDEX**	ROSETTI MARINO

Sub System N°:	XX-01	**TICK AS APPROPRIATE**	ONSHORE	CKBX
Description:	SS Test		OFFSHORE	CKBX

1. ***READY FOR COMMISSIONING CERTIFICATE*** *Ready For Commissioning Certificate (RFC)*	*CKBX*
2. ***CONSOLIDATED PUNCH LISTS*** *Cleared and Residual Items*	*CKBX*
3. ***SYSTEM/SUB-SYSTEM LIMIT DRAWINGS*** *Mark-up drawings showing the limits of the relevant System/Sub-System*	*CKBX*
4. ***MECHANICAL COMPLETION STATUS INDEX – BUILDING DISCIPLINE*** *Building Sub-System Status Index (Print out) and Check/Test sheets*	*CKBX*
5. ***MECHANICAL COMPLETION STATUS INDEX – ELECTRICAL DISCIPLINE*** *Electrical Sub-System Status Index (Print out) and Check/Test Sheets* *Hazardous Area Equipment Detailed Inspection*	*CKBX*
6. ***MECHANICAL COMPLETION STATUS INDEX - INSTRUMENTAL DISCIPLINE*** *Instrumental Sub-System Status Index (Print out) and Check/Test Sheets*	*CKBX*
7. ***MECHANICAL COMPLETION STATUS INDEX - MECHANICAL DISCIPLINE*** *Mechanical SubSystem Status Index (Print out) and Check/Test Sheets*	*CKBX*
8. ***MECHANICAL COMPLETION STATUS INDEX - TELECOMMUNICATION DISCIPLINE*** *Telecommunication Sub-System Status Index (Print out) and Check/Test Sheets*	*CKBX*
9. ***MECHANICAL COMPLETION STATUS INDEX - HVAC DISCIPLINE*** *HVAC Sub-System Status Index (Print out) and Check/Test Sheets*	*CKBX*
10. ***MECHANICAL COMPLETION STATUS INDEX - PIPING DISCIPLINE*** *Piping Sub-System Status Index and Check/Test Sheets*	*CKBX*
11. ***MECHANICAL COMPLETION INDEX - SAFETY DISCIPLINE*** *Safety Sub-System Status Index (Print out) and Check/Test Sheets*	*CKBX*
12. ***FAT / VENDOR REPORTS*** *Fat reports issued by vendors and/or vendor reports*	*CKBX*
13. ***MECHANICAL COMPLETION CHANGES / MARK-UPS*** *A copy of the changes initiated during the Mechanical Completion process pertaining to the relevant Sub-System will be incorporated in this section*	*CKBX*

Note: Under the generic terminology “Building” are also covered the following disciplines: **Structural, Painting**
Under the generic terminology “Instrumental” is also covered the following discipline: **Fire & Gas**