Base Load Power Hub (BLPH)

SPARE PART INDEX REGISTER (COMMISSIONING, 2-YEARs OPERATION, CAPITAL) BALL, SBB, DBB VALVES

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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.

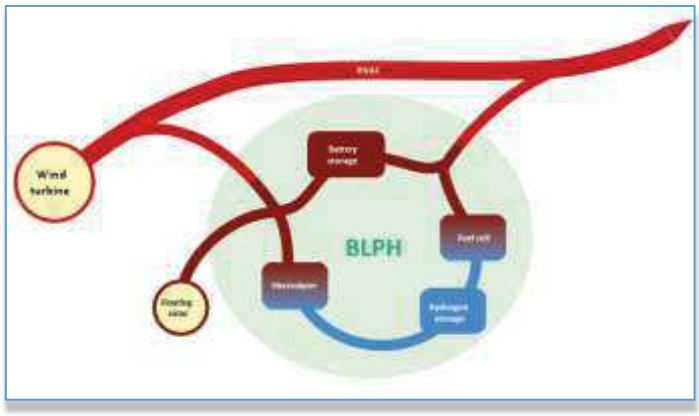


Figure 3 – BLPH Concept

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.

ROSETTI MARINO

SPARE PARTS LIST

CROSSWIND

Document Title	Commissioning and 2 years spare parts list
The document relates to	HOLLANDSE KUST NOORD WIND PARK Project - Base Load Power Hub (BLPH)
Project ID	123A90

Contract	Doc. n°	Rev.	Rev. Date	Status	Class
CW-I-WP4-2023-05	1724000798-COM-LIS-00014	04	15/04/2025	Status: AFC	2

Supplier: INDRA SRL	PO Number: 1721002632	PO description: BALL VALVE	Contact name: MRS. GAIA GRANATA
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		E mail: g.granata@indra.it	WEBSITE: www.ind

General Information:

The equipment consists of the following units/components

1	Tag no.	BLPH-MV-111	BLPH-MV-210 - BLPH-MV-242	BLPH-MV-149 - BLPH-MV-270	BLPH-MV-024 - BLPH-MV-028	BLPH-MV-172 - BLPH-MV-404	BLPH-MV-044 - BLPH-MV-054	BLPH-MV-048 - BLPH-MV-051	BLPH-MV-464 - BLPH-MV-465	BLPH-MV-275	BLPH-MV-417	BLPH-MV-263 - BLPH-MV-419	BLPH-MV-412	BLPH-MV-214 - BLPH-MV-400	BLPH-MV-402	BLPH-MV-003 - BLPH-MV-010	BLPH-MV-032 - BLPH-MV-266	BLPH-MV-019	BLPH-MV-034 - BLPH-MV-	BLPH-MV-035 - BLPH-MV-	BLPH-MV-269 - BLPH-MV-271	BLPH-MV-278	BLPH-MV-007 - BLPH-MV-009	BLPH-MV-043 - BLPH-MV-050	BLPH-MV-001	BLPH-MV-002 - BLPH-MV-016	BLPH-MV-006 - BLPH-MV-033	BLPH-MV-005	BLPH-MV-013 - BLPH-MV-014	BLPH-MV-025 - BLPH-MV-038	BLPH-MV-150 - BLPH-MV-151	BLPH-MV-411	BLPH-MV-166 - BLPH-MV-167
2	Tag description	BALL VALVE	BALL VALVE	BALL VALVE	BALL VALVE	BALL VALVE	BALL VALVE	BALL VALVE	BALL VALVE	BALL VALVE	BALL VALVE	BALL VALVE	BALL VALVE	BALL VALVE	BALL VALVE	BALL VALVE	BALL VALVE	BALL VALVE	BALL VALVE	TRUNNION BV	BALL VALVE	BALL VALVE	BALL VALVE	BALL VALVE	BALL VALVE	BALL VALVE	BALL VALVE	TRUNNION BV	MONOFLANGE	MONOFLANGE	MONOFLANGE	MONOFLANGE	MONOFLANGE
3	Manufacturer model/type no.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4	Manufacturer serial no.	105942	105943-105957	105958-105959	105960-105961	105962-105966	105967-105969	105970-105971	105972-105973	105974	105977	105975-105976	105978	105979-105980	105981	105982-106009	106010-106015	106017	106018-106023	106042-106047	106024-106026	106027	106028-106029	106030-106031	106032	106033-106034	106035-106041	106048	106049-106062	106063-106066	106067-106068	106072	106069-106071
5	No. of units	1	15	2	2	5	3	2	2	1	1	2	1	2	1	28	6	1	6	6	3	1	2	2	1	2	7	1	14	4	2	1	3
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Item Number	Total number of identical spares installed (7)	Description of recommended spare parts (8)	Project Datasheet no. (9)	Project Detail dwg. no. (10)	Item ref. (11)	Material (12)	Certificate Type (if applicable) (13)	Certificate Reference (if applicable) (14)	Shelf life (years) (15)	Weight (net) (16)	Weight (gross) (17)	Volume (18)	HS Code (19)	ECCN Code (20)	% US Content (21)	Country of origin (22)	Supplier part no. (23)	Manufacturer part no. (24)	Manufacturer name (25)	Commissioning spares – Quantity ordered (26)	2 Years spares – Quantity ordered (27)	Remarks (28)
1	1	SOFT spare part kit for floating (O-Rings, Gaskets, Seat rings)	BS01C01RF	00.VSF.2684/V	5,6,7,10,12	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0416	00.KIT.0416	Indra	1	1	Kit valid also for code 00.VSF.2689/V and 00.VSF.2770/V and 00.VSF.2686/V
2	15	SOFT spare part kit for floating (O-Rings, Gaskets, Seat rings)	BS01C01RF	00.VSF.2687/V	5,6,7,10,12	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0416	00.KIT.0416	Indra	1	1	Kit valid also for code 00.VSF.2689/V and 00.VSF.2770/V and 00.VSF.2686/V
3	2	SOFT spare part kit for floating (O-Rings, Gaskets, Seat rings)	BS01C01RF	00.VSF.2690/V	5,6,7,10,12	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0420	00.KIT.0420	Indra	1	1	Kit valid also for code 00.VSF.2691/V
4	2	SOFT spare part kit for floating (O-Rings, Gaskets, Seat rings)	BS01C01RFH	00.VSF.2693/V	5,6,7,10,12	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0417	00.KIT.0417	Indra	1	1	
5	5	SOFT spare part kit for floating (O-Rings, Gaskets, Seat rings)	BS01C01RFH	00.VSF.2694/V	5,6,7,10,12	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0418	00.KIT.0418	Indra	1	1	
6	3	SOFT spare part kit for floating (O-Rings, Gaskets, Seat rings)	BS01F01RF	00.VSF.2685(T)	5,6,7,10,12	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0419	00.KIT.0419	Indra	1	1	
7	2	SOFT spare part kit for floating (O-Rings, Gaskets, Seat rings)	BS01F01RF	00.VSF.2688(T)	5,6,7,10,12	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0419	00.KIT.0419	Indra	1	1	
8	2	SOFT spare part kit for floating (O-Rings, Gaskets, Seat rings)	BA01F01RF	00.VSF.2692(T)	5,6,7,10,12	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0421	00.KIT.0421	Indra	1	1	
9	1	SOFT spare part kit for floating (O-Rings, Gaskets, Seat rings)	BS01B01RF	00.VSF.2686/V	5,6,7,10,12	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0416	00.KIT.0416	Indra	0	0	Same Kit supplied for code 00.VSF.2687/V and 00.VSF.2684/V
10	1	SOFT spare part kit for floating (O-Rings, Gaskets, Seat rings)	BS01B01RF	00.VSF.2689/V	5,6,7,10,12	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0416	00.KIT.0416	Indra	0	0	Same Kit supplied for code 00.VSF.2687/V and 00.VSF.2684/V
11	2	SOFT spare part kit for floating (O-Rings, Gaskets, Seat rings)	BS01B01RF	00.VSF.2770/V	5,6,7,10,12	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0416	00.KIT.0416	Indra	0	0	Same Kit supplied for code 00.VSF.2687/V and 00.VSF.2684/V
12	1	SOFT spare part kit for floating (O-Rings, Gaskets, Seat rings)	BS01B01RF	00.VSF.2691/V	5,6,7,10,12	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0420	00.KIT.0420	Indra	0	0	Same Kit supplied for code 00.VSF.2690/V
13	2	SOFT spare part kit for floating (O-Rings, Gaskets, Seat rings)	BA01P01KT	00.VSF.2683(T)	5,6,7,10,12	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0419	00.KIT.0419	Indra	1	1	
14	1	SOFT spare part kit for floating (O-Rings, Gaskets, Seat rings)	BC01C01RFH	00.VSF.2695/V	5,6,7,10,12	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0422	00.KIT.0422	Indra	1	1	
15	28	SOFT spare part kit for floating (O-rings, Gaskets, Stem packing of Needle, Seat Rings)	DA03C01RFH	00.VSF.2680/V	5,6,7,10,12	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0432	00.KIT.0432	Indra	1	3	
16	6	SOFT spare part kit for floating (O-rings, Gaskets, Stem packing of Needle, Seat Rings)	DA03C01RFH	00.VSF.2681/V	6,7,8,11,13	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0433	00.KIT.0433	Indra	1	1	
17	1	SOFT spare part kit for floating (O-rings, Gaskets, Stem packing of Needle, Seat Rings)	DA03C01RFH	00.VSF.2682/V	5,6,7,10,12	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0434	00.KIT.0434	Indra	1	1	
18	6	SOFT spare part kit for floating (O-rings, Gaskets, Stem packing of Needle, Seat Rings)	DA03C01RFH	00.VSF.2679/V	5,17,18,20,21	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0435	00.KIT.0435	Indra	1	1	
19	6	SOFT spare part kit for floating (O-rings, Gaskets, Stem packing of Needle, Seat Rings)	DA03C01RFH	00.VSFT.0223/V	5,21,22,23,24,24a,26a 35a,27,28,29,30,43	As per GAD	N/A	N/A	N/A				8481900090			Italy	00.KIT.0436 / 00.KIT.0440	00.KIT.0436 / 00.KIT.0440	Indra	1	1	
20	3	SOFT spare part kit for floating (O-rings, Gaskets, Stem packing of Needle, Seat Rings)	BS01B01RFS	00.VSF.2697/V	5,6,7,10,12,G	As per GAD	N/A	N/A	N/A				8481900090			Italy	00.KIT.0425	00.KIT.0425	Indra	1	1	
21	1	SOFT spare part kit for floating (O-rings, Gaskets, Stem packing of Needle, Seat Rings)	BS01B01RFS	00.VSF.2699/V	6,7,8,11,13,G	As per GAD	N/A	N/A	N/A				8481900090			Italy	00.KIT.0426	00.KIT.0426	Indra	1	1	
22	2	SOFT spare part kit for floating (O-rings, Gaskets, Stem packing of Needle, Seat Rings)	BS01C01RFHS	00.VSF.2701/V	5,6,7,10,12,G	As per GAD	N/A	N/A	N/A				8481900090			Italy	00.KIT.0427	00.KIT.0427	Indra	1	1	
23	2	SOFT spare part kit for floating (O-rings, Gaskets, Stem packing of Needle, Seat Rings)	BS01F01RFS	00.VSF.2698(T)	6,7,8,11,13,G	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0428	00.KIT.0428	Indra	1	1	
24	1	SOFT spare part kit for floating (O-rings, Gaskets, Stem packing of Needle, Seat Rings)	BS01C01RFS	00.VSF.2696/V	5,6,7,10,12,G	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0429	00.KIT.0429	Indra	1	1	
25	2	SOFT spare part kit for floating (O-rings, Gaskets, Stem packing of Needle, Seat Rings)	BA01C01RFHS	00.VSF.2702/V	5,6,7,10,12	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0430	00.KIT.0430	Indra	1	1	
26	7	SOFT spare part kit for floating (O-rings, Gaskets, Stem packing of Needle, Seat Rings)	BA01C01RFHS	00.VSF.2700/V	5,17,18,20,21	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0431	00.KIT.0431	Indra	1	1	
27	1	SOFT spare part kit for trunnion (O-Rings, Gaskets)	BA01C01RFHS	00.VSFT.0224/V	5,21,22,23,24,24a,25,26,26a, 27,28,29,30	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0424 / 00.KIT.0441	00.KIT.0424 / 00.KIT.0441	Indra	1	1	
28	14	Stem Packing only	MD03C02YH	00.MNF.0604/V	G	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0439	00.KIT.0439	Indra	1	1	
29	4	Stem Packing only	MS01C02YH	00.MNF.0608/V	G	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0437	00.KIT.0437	Indra	0	0	Same Kit supplied for code00.MNF.0606/V
30	2	Stem Packing only	MS01C02Y	00.MNF.0605/V	G	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0437	00.KIT.0437	Indra	1	1	Kit valid also for code 00.MNF.0608/V and 00.MNF.0612/V
31	1	Stem Packing only	MS01B02Y	00.MNF.0606/V	G	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0438	00.KIT.0438	Indra	1	1	
32	3	Stem Packing only	MS01B02Y	00.MNF.0612/V	G	As per GAD	N/A	N/A	N/A	-	-	-	8481900090	-		Italy	00.KIT.0437	00.KIT.0437	Indra	0	0	Same Kit supplied for code00.MNF.0606/V
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34																						
35																						