Base Load Power Hub (BLPH)

Electrical Load List & Balance (CCS MODE 4A : 'EMERGENCY MODE (Island)')

Document Number: 123A90-DDL-EL-LIS-20146

Document Class: 2

03	23/09/2024	Accepted for Construction (AFC)	VRA	AMA	DLO
02	24/06/2024	Accepted for Construction (AFC)	VRA	AMA	DLO
01	15/04/2024	Issue for Review (IFR)	NLK	FMA/AMA	FPA/DLO
00	15/01/2024	Issue for Review (IFR)	NLK	FMA/AMA	FPA/DLO
Rev.	Date	Description	Prepared	Reviewed	Approved

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

SH.	DESCRIPTION	REVISIONS							
		00	01	02	03				
1	Cover	00	01	02	03				
2	Table of Contents	00	01	02	03				
3	Revision / Change Log / Hold List	00	01	02	03				
4	Notes	00	01	02	03				
5	Notes	00	01	02	03				
6	Load Summary	00	01	02	03				
7	66kV Switchboard "HNA6-AFA70"	00	01	02	03				
8	6.6kV Switchboard "SG-100D1"	00	01	02	03				
9	LV Switchboard "SG-200N1"	00	01	02	03				
10	DC Battery System - Switchgears Control	00	01	02	03				
11	DC UPS - NAVAID System	00	01	02	03				
12	AC UPS - PAS (CCS / SIS / DCS / Field Instruments)	00	01	02	03				
13	AC UPS - FIRE & GAS	00	01	02	03				
14	Lighting & Small Power BoP	00	01	02	03				

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)
02	Accepted for Construction (AFC)
03	Accepted for Construction (AFC)

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

#	NOTES
1	This Load List CCS Mode 1 : "Import charging" is also valid for CCS Mode 0 : "IDLE mode.
2	Load details are based on the following documents:

- Electrical Single Line Diagram HV & MV Systems	Doc. No.	123A90-DDL-EL-DG-20015
- Process Control, Operation, Start-up and Shutdown Philosophy	Doc. No.	123A90-DDL-PR-RE-80031
- Lighting & Sockets Circuits Diagrams	Doc. No.	123A90-DDL-EL-DL-20125 ÷ 20131
- Electrolyser – Electrical Data - Reply for Technical Query	Doc. No.	123A90-PML-PM-TQ-00026_Reply
- Fuel Cell – Electrical Data - Reply for Technical Query	Doc. No.	123A90-PML-PM-TQ-00027_Reply
- Ballard - BLPH Project - Load List	Doc. No.	K559-2254-CWIWP4202202-E14-001 Rev.002
- Balance of Power	Doc. No.	C63-ETT-002
- Load List	Doc. No.	K559-2254-CWIWP4202201-E14-001
- Electrical System Description and Design Philosophy	Doc. No.	123A90-DDL-EL-SP-20141

3 **Load Types**: P (Package) / M (Motor) / D (Distribution Board) / H (Heating) / J (UPS) / F (Feeder) / T (Transformer)

4 **Branch Type**: Branch shall be defined mainly as "**Motor**" or "**Feeder**".

5 Load Classification columns are shown to distinguish between the criticality of loads, especially for Load Shedding purposes.
Options include the following:
- **Vital** : A service which if it fails, will endanger lives
- **Essential** : A service which if it fails, will affect safety, continuity or quality.
- **Normal** : Loads that are not essential.
- **Restart** : A start after a power failure, in a predetermined sequence, of all electric consumers that were in operation before power failure occurred. During restart it is assumed that UPS power is still available.
- **Black start** : A start after a total power failure, where all reserve power systems i.e. all battery systems, are also discharged.

6 **Voltage Type:**
S = Single phase (two wires)
T = Three phases (three wires)
TN = Three phases plus neutral (four wires)
DC = Direct current (two wires)

7 '**Utility Factor' (U)**, is a percentage applied to items of equipment dependent upon the plant's operating mode.

8 **'Absorbed Power' (A)**, is defined as the following:
A) For motor loads e.g. pumps, fans & compressors: shaft load on duty point i.e. including the process hydraulic load plus mechanical efficiency;
B) For Feeders: the peak load of the associated equipment, skid, board, etc.
C) For Instrumentation, telecoms, and computers: the calculated load during operation of the plant at full load;
D) For Lighting: the load during dark hours;
E) For electric heaters: the calculated load during operation of the plant at full load.

9 **'Nameplate Apparatus Rating' (B)**, is defined as the following:
The full load rating as shown on the nameplate of the motor or item of electrical equipment. NOTE: For electric motors the nameplate rated power is the maximum power available at the shaft whereas the absorbed power at the motor terminals is slightly higher as it takes into account the motor's efficiency.

10 **'Utilization Factor' (C) = (A) / (B)**, but in case of motors is defined as the following:
Motor utilisation is the ratio of shaft power consumed to motor rated power. API 610 Table 12 defines Utilisation Factors for a selection of electric motor ratings e.g. the minimum motor rating required to drive a pump at its rated output power. As per ANSI / API 610, Table 12 'Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries' recommended Utilization Factors are shown below:

Motor Rating	% Pump Power	Utilisation (pu)
<22	125	0.80
22 TO 55	115	0.87
>55	110	0.91

#	NOTES
11	Diversity factors x, y and z are applied to the different loads to establish the normal running load and peak load of the system or sub-system These Diversity factors shall be set manually, (these are suggested values): **- Continuous Load** = X% Demand Load Factor; X = 100% **- Intermittent Load** = Y% Demand Load Factor; Y = 30% **- Standby Load** = Z% Demand Load Factor; Z = 10% **- Spare** = 0% Demand Load: here are included feeders "B", considering 100% load through feeder "A", as well as, spare feeders.
12	**Duty:** **- Continuous 'C':** Continuous Loads have a diversity factor of **"X%"** and are summated to determine maximum demand. **- Intermittent 'I':** The contribution of Intermittent loads to Maximum Demand is the larger of either **"Y%"** of the summated Intermittent load or largest single Intermittent load. These Intermittent loads are used to determine the system's Maximum Demand. **- Standby 'S':** The contribution of Standby loads to Maximum Demand is the larger of either **"Z%"** of the summated Standby load or largest single Standby load. These Standby loads are used to determine the systems's Peak Demand. **- Spare 'Sp':** Spare Loads have a diversity factor of **"0%"**, but the associated feeders/drawers/cubicles shall be considered for the board dimensioning and arrangement.
13	**Consumed Power (G**) = A/D and Utilisation Factor (C)
14	Load totals have been arranged into 2 Categories. These are as follows: 1) **System Maximum Demand:** sum of all loads with continuous duty + sum of all loads with intermittent duty (or single largest) , each one with corresponding diversity factors applied = **X% * Σ Continuous Loads + Y% * Σ Intermittent Loads (or single largest)**. 2) **System Peak Demand:** sum of all loads with continuous duty + sum of all loads with Intermittent duty (or single Largest) + sum of all loads with standby duty (or single largest), each one with corresponding diversity factors applied = **X% * Σ Continuous Loads + Y% * Σ Intermittent Loads (or single largest) + Z% * Σ Stand-by Loads (or single largest)**.
15	LV Utilities, shall include all the plant services, and in case of dedicated Distribution Boards for some services, as for example Lighting system, the complete load schedule must be listed, it mean every and each single lamp and socket, but with its respective diversity factor.
16	To do the Load balance shall be taken in consideration the Single Line Diagram and the Power System architecture.
17	Percentage of normal running motors with respect to the total normal running load is shown for the benefit when running short circuit studies.
18	**Contingency & Unplanned Growth Factor**: Contingency margin is applied to reflect uncertainty in selected equipment ratings during the design. As an example, the following factors for design contingency may be used: 15% at the end of pre-FEED, 10% at the end of FEED and 0% once supplier data has been confirmed at conclusion of Detailed Design.
19	**Planned Growth Factor**: Growth margin is applied for future loads that may be added following completion of the initial installation.
20	Tag numbers are according to Procedure Doc.: K559-2254-PM-PHI-001
21	**Data Source:** **- FE** = From Estimation **- FT** = From Tender **- FO** = From Order (preliminary from Purchase Order) **- FF** = From order (final) **- FD** = From design
22	**Schematic Control Type:** reference to the applicable schematic and control philosophy to be implemented in the board.
23	**Upper Source (Board Tag):** is the board one step upper.
24	**kVAr** = TAN(ARCCOS(Power Factor))*kW
25	$\mathbf{kVA} = \sqrt{\mathrm{kW}^2 + \mathrm{kVAr}^2}$
26	400V auxiliary loads are considered as per actual package vendors document load data.
27	The term 'Charging' is considered as both charging of BESS and running the electrolyser (to create / store hydrogen).
28	The measured response of BLPH will specifically exclude the utility consumption of the platform itself (gross exported power - refer TQ-013).

ROSETTI MARINO

ELECTRICAL LOAD LIST
SUMMARY

OPERATION MODE: (CCS MODE 4A : 'EMERGENCY MODE (Island")

CROSSWIND

Project: HOLLANDSE KUST NOORD WIND PARK Project

Contract No. CW-I-WP4-2023-05

Doc. #: 123A90-DDL-EL-LIS-20146

Rev. 03 **Sheet:** 6 of 14

Board	Sheet No.Ref.	Voltage	Maximum Normal Demand				Peak Demand				Peak Current	Bus-bar Rating	Bus-bar Spare Capacity	Grid Supply/ UPS / Transf./ Gen. Rating	Spare Capacity	Transf. / UPS / Gen.
		kV	P - kW	Q - kVAr	S - kVA	PF	P - kW	Q - kVAr	S - kVA	PF	Amp	Amp	%	kVA	%	
66kV Switchboard "HNA6-AFA70"	Sheet 7	66,000	0,0	0,0	0,0		0,0	0,0	0,0		0	1250	100%	12800	N/A	WindFarm
6.6kV Switchboard "SG-100D1"	Sheet 8	6,600	0,0	0,0	0,0		0,0	0,0	0,0		0	630	100%	7000		TR-100AD1
LV Switchboard "SG-200N1"	Sheet 9	0,400	447,4	284,3	530,1	0,84	518,3	352,7	626,9	0,83	905	2500	64%	1600	61%	TR-200DE1
DC Battery System - Switchgears Control "UP-200F1"	Sheet 10	0,110	3,0	0,0	3,0	1,00	3,4	0,0	3,4	1,00	31	100	69%	10	66%	
DC UPS - NAVAID System "UP-200F2"	Sheet 11	0,024	2,0	0,5	2,1	0,97	2,0	0,5	2,1	0,97	50	250	80%	5	58%	
AC UPS - PAS "UPS-200F3"	Sheet 12	0,400	11,3	6,1	12,9	0,88	12,5	7,0	14,3	0,87	21	63	67%	35	59%	
AC UPS - FIRE & GAS "UP-200F4"	Sheet 13	0,400	2,6	1,9	3,2	0,80	4,0	3,0	5,0	0,80	7	32	78%	15	67%	
Lighting & Small Power BoP "DP-200N1"	Sheet 14	0,400	11,4	3,6	12,0	0,95	14,2	5,7	15,3	0,93	17	63	65%	N/A		

NOTES:

1) The Peak Demand already includes the Contingency Allowance Factor and Planned Growth Factor, where this last is the margin for future loads that may be added following completion of the BLPH Project, it means that the value indicated in the column Spare Capacity", is an additional margin over the "Contingency Allowance" and "Growth".

ROSETTI MARINO

ELECTRICAL LOAD LIST

BOARD: 66kV Switchboard "HNA6-AFA70"

OPERATION MODE: (CCS MODE 4A : 'EMERGENCY MODE (Island'')

CROSSWIND

Project:	HOLLANDSE KUST NOORD WIND PARK Project
Contract No.	CW-I-WP4-2023-05
Doc. #:	123A90-DDL-EL-LIS-20146
Rev.	03
Sheet:	7 of 14

	User Input																	(G) Consumed Power						Additional Information					
	Tag Number	Description	Load Type	Branch Type	Essential	Normal	Vital	Re-start	Duty	Voltage	Voltage Type	(U) Utility Factor	(A) Absorbed Power @ 100% load (Mechanical kW in case of Motors))		(B) Nameplate Apparatus Rating (Mechanical kW in case of Motors)		(C) Utilization Factor	(D) Efficiency @ 100% Load	(E) Power Factor @ 100% Load	Continuous Load		Intermittent Load		Stand-By Load		Data Source	Schematic Control Type	WBS (Location)	Upper Source (Board Tag)	Remarks	Rev
										(kV)		%	Value	Unit	Value	Unit	(pu)	(pu)	(pu)	(kW)	(kVAr)	(kW)	(kVAr)	(kW)	(kVAr)						
1	SG-200D1	6.6kV Switchboard (TR-100AD1)	T	Feeder		X			C	66	T			kW	7000,00	kVA		0,99	0,97							FF					03
2																														
3																														
4																														
5																														
6																														
7																														
8																														
9																														
10																														
11																														
12																														
13																														
14																														
15																														
16																														
17																														
18																														
19																														
20																														
21																														
22																														
23																														
24																														
25																														
26																														
27																														
28																														
29																														
30																														
31																														
32																														
33																														
34																														
35																														
36																														
37																														
38																														
39																														
40																														
41																														
42																														
43																														
44																														
45																														

Board Demand Factor:

Ratio of the Peak demand to the total connected load (including allowance factors):

No. of Connected Motors:

No. of Motors Running Continuously:

Σ Motor Running Name Plate Ratings (kW):

Utilization Factor for Motors :

Motor Rating	% Pump Power	Utilisation
< 22 kW	125	**0,80**
22 to 55 kW	115	**0,87**
> 55 kW	110	**0,91**

Load Criticality:

- Essential
- Normal
- Vital
- Restart

Duty:

C = Continuous (X) =	100%
I = Intermittent (Y) =	30%
S = Stand-By (Z) =	10%
Sp = Spare =	0%

Coincidence or "Diversity Factors" X, Y and Z are applied to the different loads to establish the normal running load and peak load.

Contingency Allowance Factor =	
Planned Growth Allowance Factor =	

Bus Bar Voltage: 66.000 **V,** 50 **Hz**

Observations:

1) Generated, stored and exported power values are shown as negative values.

2) Spare feeders/drawers/cubicles shall be included in the above list, in order to be considered during the board dimensioning.

CONTINUOUS		*INTERMITTENT*		*STAND-BY*				*NORMAL RUNNING*		*PEAK LOAD*	
kW	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**
						Single Largest Intermitent Load					
CONTINGENCY ALLOWANCE		CONTINGENCY ALLOWANCE		CONTINGENCY ALLOWANCE				**Total kVA**		**Total kVA**	
						Single Largest Stand-By Load					
GROWTH ALLOWANCE		GROWTH ALLOWANCE		GROWTH ALLOWANCE							
TOTAL		**TOTAL**		**TOTAL**							
Total kVA		**Total kVA**		**Total kVA**		Intermitent Load with Coincidence Factor					
						Stand-By Load with Coincidence Factor					

Board Rating:

Peak Load (Amp):

Board Bar Capacity (Amp): 1250

Board Bar Spare Capacity (Amp): 100%

ROSETTI MARINO

ELECTRICAL LOAD LIST

BOARD: 6.6kV Switchboard "SG-100D1"

OPERATION MODE: (CCS MODE 4A : 'EMERGENCY MODE (Island")

CROSSWIND

Project: HOLLANDSE KUST NOORD WIND PARK Project

Contract No. CW-I-WP4-2023-05

Doc. #: 123A90-DDL-EL-LIS-20146

Rev. 03 | **Sheet:** 8 of 14

	Tag Number	Description	Load Type	Branch Type	Essential	Normal	Vital	Re-start	Duty	Voltage	Voltage Type	(U) Utility Factor	(A) Absorbed Power @ 100% load (Mechanical kW in case of Motors))		(B) Nameplate Apparatus Rating (Mechanical kW in case of Motors)		(C) Utilization Factor	(D) Efficiency @ 100% Load	(E) Power Factor @ 100% Load	(G) Consumed Power: Continuous Load		(G) Consumed Power: Intermittent Load		(G) Consumed Power: Stand-By Load		Data Source	Schematic Control Type	WBS (Location)	Upper Source (Board Tag)	Remarks	Rev
										(V)		%	Value	Unit	Value	Unit	(pu)	(pu)	(pu)	(kW)	(kVAr)	(kW)	(kVAr)	(kW)	(kVAr)						
1	A-85000	BESS Package	P	Feeder	X				C	6.600	T	56%	-1000,0	kW	1250,0	kVA	-0,80	0,95	0,83	-530,48	-360,82					FF					03
2	A-80000	Fuel Cell Package	P	Feeder	X				C	6.600	T	95%	1,6	kW	1250,0	kVA	0,00	0,95	0,87	1,60	0,91					FF				kW as per TQ-00027	03
3	A-20000	Electrolyser Package	P	Feeder	X				Sp	6.600	T	100%	0,0	kW	3200,0	kVA	0,00	0,97	0,99							FF				kVA as per TQ-00026	03
4	TR-200ED1	Solar Package	T	Feeder	X				S	6.600	T	0%	480,0	kW	500,0	kVA	0,96	1,00	1,00					0,00	0,00	FF					03
5	TR-200DE1	LV Switchboard (SG-200N1)	T	Feeder		X			C	6.600	T	100%	518,3	kW	1600,00	kVA	0,32	0,98	0,83	528,88	359,92	0,00	0,00	0,00	0,00	FF					03
6																														
7																														
8																														
9																														
10																														
11																														
12																														
13																														
14																														
15																														
16																														
17																														
18																														
19																														
20																														
21																														
22																														
23																														
24																														
25																														
26																														
27																														
28																														
29																														
30																														
31																														
32																														
33																														
34																														
35																														
36																														
37																														
38																														
39																														
40																														
41																														
42																														
43																														
44																														
45																														

Board Demand Factor:

Ratio of the Peak demand to the total connected load (including allowance factors): 0,0%

No. of Connected Motors: 0

No. of Motors Running Continuously: 0

Σ Motor Running Name Plate Ratings (kW): 0

Utilization Factor for Motors :

Motor Rating	% Pump Power	Utilisation
< 22 kW	125	**0,80**
22 to 55 kW	115	**0,87**
> 55 kW	110	**0,91**

Load Criticality:

- Essential
- Normal
- Vital
- Restart

Duty:

C = Continuous (X) = 100%
I = Intermittent (Y) = 30%
S = Stand-By (Z) = 10%
Sp = Spare = 0%

Coincidence or "Diversity Factors" X, Y and Z are applied to the different loads to establish the normal running load and peak load.

Contingency Allowance Factor = 0%
Planned Growth Allowance Factor = 0%

Bus Bar Voltage: 6.600 V, 50 Hz

Observations:

1) Generated, stored and exported power values are shown as negative values.

2) Spare feeders/drawers/cubicles shall be included in the above list, in order to be considered during the board dimensioning.

	CONTINUOUS		INTERMITTENT		STAND-BY	
	kW	kVAr	kW	kVAr	kW	kVAr
	0,0	0,0	0,0	0,0	0,0	0,0
	CONTINGENCY ALLOWANCE		CONTINGENCY ALLOWANCE		CONTINGENCY ALLOWANCE	
	0,0	0,0	0,0	0,0	0,0	0,0
	GROWTH ALLOWANCE		GROWTH ALLOWANCE		GROWTH ALLOWANCE	
	0,0	0,0	0,0	0,0	0,0	0,0
	TOTAL		TOTAL		TOTAL	
	0,0	0,0	0,0	0,0	0,0	0,0
	Total kVA		Total kVA		Total kVA	
	0,0		0		0,0	
	0		0		0	

	kW	kVAr
Single Largest Intermitent Load	0,0	0,0
	Total kVA	
Single Largest Stand-By Load	0,0	
	0,0	
	0	
Intermitent Load with Coincidence Factor	0,0	0,0
Stand-By Load with Coincidence Factor	0,0	0,0

NORMAL RUNNING		PEAK LOAD	
kW	kVAr	kW	kVAr
0,0	0,0	0,0	0,0
Total kVA		Total kVA	
0,0		0,0	
0		0	

Board Rating:

Peak Load (Amp):	0
Board Bar Capacity (Amp):	**630**
Board Bar Spare Capacity (Amp):	100%

ROSETTI MARINO

ELECTRICAL LOAD LIST

BOARD: LV Switchboard "SG-200N1"

OPERATION MODE: (CCS MODE 4A : 'EMERGENCY MODE (Island'')

CROSSWIND

Project: HOLLANDSE KUST NOORD WIND PARK Project

Contract No. CW-I-WP4-2023-05

Doc. #: 123A90-DDL-EL-LIS-20146

Rev. 03 | **Sheet:** 9 of 14

	User Input																	(G) Consumed Power						Additional Information					
	Tag Number	Description	Load Type	Branch Type	Essential	Normal	Vital	Re-start	Duty	Voltage	Voltage Type	(U) Utility Factor	(A) Absorbed Power @ 100% load (Mechanical kW in case of Motors))		(B) Nameplate Apparatus Rating (Mechanical kW in case of Motors)		(C) Utilization Factor	(D) Efficiency @ 100% Load	(E) Power Factor @ 100% Load	Continuous Load		Intermittent Load		Stand-By Load		Data Source	Schematic Control Type	WBS (Location)	Upper Source (Board Tag)	Remarks	Rev
										(V)		%	Value	Unit	Value	Unit	(pu)	(pu)	(pu)	(kW)	(kVAr)	(kW)	(kVAr)	(kW)	(kVAr)						
1	JB-200E2	Temporary Generator / Mobile Battery Pack	P	Feeder				x	Sp	400	TN	100%	138,00	kW	138,50	kW	1,00	0,95	0,95							FD	Contactor				03
2	CP-850E3	BESS PCS Cabinet	P	Feeder		x			C	400	TN	95%	4,54	kW	11,09	kW	0,41	0,95	0,92	4,54	1,93					FT	Contactor			KW as per Vendor Load list	03
3	A-80000	Fuel Cell Auxiliary Load	P	Feeder		x			I	400	TN	100%	9,20	kW	20,00	kW	0,46	1,00	0,88			9,20	4,97			FT	Contactor			kW as per TQ-00027	03
4	A-20000	Electrolyser Auxiliary load	P	Feeder		x			C	400	TN	100%	192,00	kW	278,52	kW	0,69	1,00	0,85	192,00	118,99					FO	Motorised			kW as per TQ-00026	02
5	CP-850E1	BESS LV1 Cabinet (+DISTR 1)	P	Feeder		x			C	400	TN	95%	6,550	kW	11,284	kW	0,58	0,95	0,90	6,550	3,17					FT	Contactor			KW as per Vendor Load list	03
6	CP-850E2	BESS LV2 Cabinet (+DISTR 2)	P	Feeder		x			C	400	TN	95%	6,550	kW	11,284	kW	0,58	0,95	0,90	6,550	3,17					FT	Contactor			KW as per Vendor Load list	03
7																															
8	JB-500E8	Water Package	P	Feeder		x			S	400	TN	70%	48,79	kW	63,56	kW	0,77	0,95	0,97					35,95	9,01	FF	contactor				03
9	K-63001-A	Instrument Air Package 01A	F	Feeder		x			C	400	TN	100%	67,40	kW	70,00	kW	0,96	0,95	0,72	70,95	68,38					FF	contactor				03
10	K-63001-B	Instrument Air Package 01B	F	Feeder		x			S	400	TN	100%	67,40	kW	70,00	kW	0,96	0,95	0,72					70,95	68,38	FF	contactor				03
11	PM-50001 A	Sea water pump A	M	Motor		x			S	400	TN	100%	1,70	kW	5,50	kW	0,31	0,89	0,74					1,91	1,74	FF	DOL				03
12	PM-50001 B	Sea water pump B	M	Motor		x			S	400	TN	100%	1,70	kW	5,50	kW	0,31	0,89	0,74					1,91	1,74	FF	DOL				03
13	JB-200E3	Crane	P	Feeder		x			S	400	TN	100%	14,78	kW	20,85	kW	0,71	0,85	0,87					17,39	9,74	FF	contactor				03
14	ESW-200N1	Welding Sockets (Top Deck)	F	Feeder		x			Sp	400	TN	100%	69,84	kW	69,84	kW	1,00	0,90	0,80							FD	NO motor				01
15	ESW-200N2	Welding Sockets (Lower Deck)	F	Feeder		x			Sp	400	TN	100%	69,84	kW	69,84	kW	1,00	0,90	0,80							FD	NO motor				01
16																															
17	B100-HSB-001	HVAC panels & Lighting & SP - HV Room	P	Feeder		x		x	C	400	TN	100%	16,40	kW	20,40	kW	0,80	0,95	0,92	17,26	7,35					FF	contactor				03
18	B200-HSB-001	HVAC panels & Lighting & SP - LV Room	P	Feeder		x		x	C	400	TN	100%	15,00	kW	20,40	kW	0,74	0,95	0,92	15,79	6,73					FF	contactor				03
19	B300-HSB-001	HVAC panels & Lighting & SP- UPS Room	P	Feeder		x		x	C	400	TN	100%	15,00	kW	18,85	kW	0,80	0,95	0,90	15,79	7,65					FF	contactor				03
20	B400-HSB-001	HVAC panels & Lighting & SP - ITER	P	Feeder		x		x	C	400	TN	100%	18,00	kW	22,80	kW	0,79	0,95	0,90	18,95	9,18					FF	contactor				03
21																															
22	CN-200N1	Impressed Current Cathodic Protection (ICCP) System	P	Feeder	x				C	400	T	100%	11,00	kVA	14,00	kVA	0,79	0,85	0,85	11,00	6,82					FF	contactor				01
23																															
24	UP-200F3	AC UPS PAS - 30min - Line A	J	Feeder	x			x	C	400	T	50%	12,46	kW	36,00	kW	0,35	0,926	0,87	6,73	3,79					FF	NO motor				03
25	UP-200F3	AC UPS PAS - 30min - Line B	J	Feeder		x			C	400	T	50%	12,46	kW	36,00	kW	0,35	0,926	0,87	6,73	3,79					FF	NO motor				03
26	UP-200F3	AC UPS PAS - Bypass	J	Feeder		x			S	400	T	0%	12,46	kW	36,00	kW	0,35	0,926	0,87					0,00	0,00	FF	NO motor				03
27	UP-200F4	AC UPS F&G - 8h - Line A	J	Feeder	x			x	C	400	T	50%	3,96	kW	18,00	kW	0,22	0,926	0,87	2,14	1,20					FF	NO motor				03
28	UP-200F4	AC UPS F&G - 8h - Line B	J	Feeder		x			C	400	T	50%	3,96	kW	18,00	kW	0,22	0,926	0,87	2,14	1,20					FF	NO motor				03
29	UP-200F4	AC UPS F&G - Bypass	J	Feeder		x			S	400	T	0%	3,96	kW	18,00	kW	0,22	0,926	0,87					0,00	0,00	FF	NO motor				03
30	UP-200F1	DC Battery System - Switchgears Control - Feeder A	J	Feeder	x			x	C	400	T	50%	3,40	kW	10,00	kW	0,34	0,86	1,00	1,98	0,00					FF	NO motor				03
31	UP-200F1	DC Battery System - Switchgears Control - Feeder B	J	Feeder		x			C	400	T	50%	3,40	kW	10,00	kW	0,34	0,86	1,00	1,98	0,00					FF	NO motor				03
32	UP-200F2	Navaid System - Feeder A	J	Feeder	x			x	C	230	S	50%	1,62	kW	2,00	kW	0,81	0,92	0,97	0,88	0,22					FO	NO motor				03
33	UP-200F2	Navaid System - Feeder B	J	Feeder		x			C	230	S	50%	1,62	kW	2,00	kW	0,81	0,92	0,97	0,88	0,22					FO	NO motor				03
34																															
39	DP-200N1	DB - Lighting & Small Power - BoP	F	Feeder		x			C	400	TN	10%	14,18	kW	14,18	kW	1,00	1,00	0,93	1,42	0,57					FF	contactor				03
40																															
41	Spare	Spare	F	Feeder		x			Sp	400	TN	100%	20,00	kW	20,00	kW	1,00	1,00	0,90								contactor				01
42	Spare	Spare	F	Feeder		x			Sp	400	TN	100%	20,00	kW	20,00	kW	1,00	1,00	0,90								contactor				01
43	Spare	Spare	F	Feeder		x			Sp	400	TN	100%	12,00	kW	15,00	kW	1,00	1,00	0,90								contactor				01
44	Spare	Spare	F	Feeder		x			Sp	400	TN	100%	5,50	kW	5,50	kW	1,00	1,00	0,90								contactor				01
45																															

Board Demand Factor:

Ratio of the Peak demand to the total connected load (including allowance factors): 35,9%

No. of Connected Motors: 2

No. of Motors Running Continuously: 0

Σ Motor Running Name Plate Ratings (kW): 0

Utilization Factor for Motors :

Motor Rating	% Pump Power	Utilisation
< 22 kW	125	**0,80**
22 to 55 kW	115	**0,87**
> 55 kW	110	**0,91**

Load Criticality:

- Essential
- Normal
- Vital
- Restart

Duty:

C = Continuous (X) =	100%
I = Intermittent (Y) =	30%
S = Stand-By (Z) =	10%
Sp = Spare =	0%

Coincidence or "Diversity Factors" X, Y and Z are applied to the different loads to establish the normal running load and peak load.

Contingency Allowance Factor =	0%
Planned Growth Allowance Factor =	15%

Bus Bar Voltage: 400 **V,** 50 **Hz**

Observations:

1) Generated, stored and exported power values are shown as negative values.

2) Spare feeders/drawers/cubicles shall be included in the above list, in order to be considered during the board dimensioning.

3) Contingency Allowance and Planned Growth Allowance Factors For UPS, NavAid System and Distribution Boards Loads are applied in individual sheets.

CONTINUOUS		*INTERMITTENT*		*STAND-BY*				*NORMAL RUNNING*		*PEAK LOAD*	
kW	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**
384,2	**244,4**	**9,2**	**5,0**	**128,1**	**90,6**	Single Largest Intermitent Load		**447,4**	**284,3**	**518,3**	**352,7**
CONTINGENCY ALLOWANCE		CONTINGENCY ALLOWANCE		CONTINGENCY ALLOWANCE		**9,2**	**5,0**	**Total kVA**		**Total kVA**	
0,0	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	Single Largest Stand-By Load		**530,1**		**626,9**	
GROWTH ALLOWANCE		GROWTH ALLOWANCE		GROWTH ALLOWANCE		**70,9**	**68,4**	**0,84 pf**		**0,83 pf**	
53,9	**35,0**	**1,4**	**0,7**	**19,2**	**13,6**			**765 Amp**		**905 Amp**	
TOTAL		**TOTAL**		**TOTAL**							
438,2	**279,4**	**10,6**	**5,7**	**147,3**	**104,2**						
Total kVA		**Total kVA**		**Total kVA**		Intermitent Load with Coincidence Factor					
519,6		**12**		**180,5**		**3,2**	**1,7**				
0,84 pf		**0,88 pf**		**0,82 pf**		Stand-By Load with Coincidence Factor					
750 Amp		**17 Amp**		**260 Amp**		**14,7**	**10,4**				

Board Rating:

Peak Load (Amp):	905
Board Bar Capacity (Amp):	**2500**
Board Bar Spare Capacity (Amp):	64%

ROSETTI MARINO

ELECTRICAL LOAD LIST

BOARD: DC Battery System - Switchgears Control

Tag: UP-200F1

OPERATION MODE: (CCS MODE 4A : 'EMERGENCY MODE (Island'')

CROSSWIND

Project: HOLLANDSE KUST NOORD WIND PARK Project

Contract No. CW-I-WP4-2023-05

Doc. #: 123A90-DDL-EL-LIS-20146

Rev. 03 | **Sheet:** 10 of 14

	User Input																	(G) Consumed Power						Additional Information					
	Tag Number	Description	Load Type	Branch Type	Essential	Normal	Vital	Re-start	Duty	Voltage	Voltage Type	(U) Utility Factor	(A) Absorbed Power @ 100% load (Mechanical kW in case of Motors))		(B) Nameplate Apparatus Rating (Mechanical kW in case of Motors)		(C) Utilization Factor	(D) Efficiency @ 100% Load	(E) Power Factor @ 100% Load	Continuous Load		Intermittent Load		Stand-By Load		Data Source	Schematic Control Type	WBS (Location)	Upper Source (Board Tag)	Remarks	Rev
										(V)		%	Value	Unit	Value	Unit	(pu)	(pu)	(pu)	(kW)	(kVAr)	(kW)	(kVAr)	(kW)	(kVAr)						
1	CP-100E1	DC control for 66 kV GIS - Line A	F	Feeder			x	x	C	110	DC	100%	1,210	kW	5,20	kW	0,23	1,00	1,00	1,21	0,00					FF					03
2	CP-100E1	DC control for 66 kV GIS - Line B	F	Feeder			x	x	C	110	DC	100%	1,000	kW	2,00	kW	0,50	1,00	1,00	1,00	0,00					FF					03
3																															
4	SG-100D1	DC Control for 6,6 kV Switchgear - Line A	F	Feeder			x	x	C	110	DC	100%	0,40	kW	1,00	kW	0,40	1,00	1,00	0,40	0,00					FF					03
5	SG-100D1	DC Control for 6,6 kV Switchgear - Line B	F	Feeder			x	x	S	110	DC	100%	0,40	kW	1,00	kW	0,40	1,00	1,00					0,40	0,00	FF					03
6																															
7	Spare	Spare	F	Feeder							DC				5,50	kW														01
8	Spare	Spare	F	Feeder							DC				2,00	kW														01
9	Spare	Spare	F	Feeder							DC				1,00	kW														01
10																															
11																															
12																															
13																															
14																															
15																															
16																															
17																															
18																															
19																															
20																															
21																															
22																															
23																															
24																															
25																															
26																															
27																															
28																															
29																															
30																															
31																															
32																															
33																															
34																															
35																															
36																															
37																															
38																															
39																															
40																															
41																															
42																															
43																															
44																															
45																															

Board Demand Factor:

Ratio of the Peak demand to the total connected load (including allowance factors):	32,2%
No. of Connected Motors:	0
No. of Motors Running Continuously:	0
Σ Motor Running Name Plate Ratings (kW):	0

Utilization Factor for Motors :

Motor Rating	% Pump Power	Utilisation
< 22 kW	125	**0,80**
22 to 55 kW	115	**0,87**
> 55 kW	110	**0,91**

Load Criticality:

- Essential
- Normal
- Vital
- Restart

Duty:

C = Continuous (X) =	100%
I = Intermittent (Y) =	30%
S = Stand-By (Z) =	10%
Sp = Spare =	0%

Coincidence or "Diversity Factors" X, Y and Z are applied to the different loads to establish the normal running load and peak load.

Contingency Allowance Factor =	0%
Planned Growth Allowance Factor =	15%

Bus Bar Voltage: 110 **V,** 50 **Hz**

Observations:

1) Generated, stored and exported power values are shown as negative values.

2) Spare feeders/drawers/cubicles shall be included in the above list, in order to be considered during the board dimensioning.

CONTINUOUS		*INTERMITTENT*		*STAND-BY*				*NORMAL RUNNING*		*PEAK LOAD*	
kW	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**
2,6	**0,0**	**0,0**	**0,0**	**0,4**	**0,0**	Single Largest Intermitent Load		**3,0**	**0,0**	**3,4**	**0,0**
CONTINGENCY ALLOWANCE		CONTINGENCY ALLOWANCE		CONTINGENCY ALLOWANCE		**0,0**	**0,0**	**Total kVA**		**Total kVA**	
0,0	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	Single Largest Stand-By Load		**3,0**		**3,4**	
GROWTH ALLOWANCE		GROWTH ALLOWANCE		GROWTH ALLOWANCE		**0,4**	**0,0**	**1,00 pf**		**1,00 pf**	
0,4	**0,0**	**0,0**	**0,0**	**0,1**	**0,0**			**27 Amp**		**31 Amp**	
TOTAL		**TOTAL**		**TOTAL**							
3,0	**0,0**	**0,0**	**0,0**	**0,5**	**0,0**			**Board Rating:**			
Total kVA		**Total kVA**		**Total kVA**		Intermitent Load with Coincidence Factor		Peak Load (Amp):	31		
3,0		**0**		**0,5**		**0,0**	**0,0**	**Board Bar Capacity (Amp):**	**100**		
1,00 pf				**1,00 pf**		Stand-By Load with Coincidence Factor		Board Bar Spare Capacity (Amp):	69%		
27 Amp		**0**		**2 Amp**		**0,0**	**0,0**				

ROSETTI MARINO

ELECTRICAL LOAD LIST

BOARD: DC UPS - NAVAID System

Tag: UP-200F2

OPERATION MODE: (CCS MODE 4A : 'EMERGENCY MODE (Island'')

CROSSWIND

Project: HOLLANDSE KUST NOORD WIND PARK Project

Contract No. CW-I-WP4-2023-05

Doc. #: 123A90-DDL-EL-LIS-20146

Rev. 03 | **Sheet:** 11 of 14

			User Input																(G) Consumed Power						Additional Information					
	Tag Number	Description	Load Type	Branch Type	Essential	Normal	Vital	Re-start	Duty	Voltage	Voltage Type	(U) Utility Factor	(A) Absorbed Power @ 100% load (Mechanical kW in case of Motors))		(B) Nameplate Apparatus Rating (Mechanical kW in case of Motors)		(C) Utilization Factor	(D) Efficiency @ 100% Load	(E) Power Factor @ 100% Load	Continuous Load		Intermittent Load		Stand-By Load		Data Source	Schematic Control Type	WBS (Location)	Upper Source (Board Tag)	Remarks	Rev
										(V)		%	Value	Unit	Value	Unit	(pu)	(pu)	(pu)	(kW)	(kVAr)	(kW)	(kVAr)	(kW)	(kVAr)						
1	UP-200F2	NAVAID LOADS	F	Feeder			x		C	24	DC	100%	1,6	kW	2,00	kW	0,81	0,92	0,97	1,76	0,44					FO					03
2																															
3																															
4																															
5																															
6																															
7																															
8																															
9																															
10																															
11																															
12																															
13																															
14																															
15																															
16																															
17																															
18																															
19																															
20																															
21																															
22																															
23																															
24																															
25																															
26																															
27																															
28																															
29																															
30																															
31																															
32																															
33																															
34																															
35																															
36																															
37																															
38																															
39																															
40																															
41																															
42																															
43																															
44																															
45																															

Board Demand Factor:

Ratio of the Peak demand to the total connected load (including allowance factors):	81,0%
No. of Connected Motors:	0
No. of Motors Running Continuously:	0
Σ Motor Running Name Plate Ratings (kW):	0

Utilization Factor for Motors :

Motor Rating	% Pump Power	Utilisation
< 22 kW	125	**0,80**
22 to 55 kW	115	**0,87**
> 55 kW	110	**0,91**

Load Criticality:

- Essential
- Normal
- Vital
- Restart

Duty:

C = Continuous (X) =	100%
I = Intermittent (Y) =	30%
S = Stand-By (Z) =	10%
Sp = Spare =	0%

Coincidence or "Diversity Factors" X, Y and Z are applied to the different loads to establish the normal running load and peak load.

Contingency Allowance Factor =	0%
Planned Growth Allowance Factor =	15%

Bus Bar Voltage: 24 **V,** 50 **Hz**

Observations:

1) Generated, stored and exported power values are shown as negative values.

2) Spare feeders/drawers/cubicles shall be included in the above list, in order to be considered during the board dimensioning.

CONTINUOUS		*INTERMITTENT*		*STAND-BY*				*NORMAL RUNNING*		*PEAK LOAD*	
kW	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**
1,8	**0,4**	**0,0**	**0,0**	**0,0**	**0,0**	Single Largest Intermitent Load		**2,03**	**0,5**	**2,03**	**0,5**
CONTINGENCY ALLOWANCE		CONTINGENCY ALLOWANCE		CONTINGENCY ALLOWANCE		**0,0**	**0,0**	**Total kVA**		**Total kVA**	
0,0	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	Single Largest Stand-By Load		**2,1**		**2,1**	
GROWTH ALLOWANCE		GROWTH ALLOWANCE		GROWTH ALLOWANCE		**0,0**	**0,0**	**0,97 pf**		**0,97 pf**	
0,3	**0,1**	**0,0**	**0,0**	**0,0**	**0,0**			**50 Amp**		**50 Amp**	
TOTAL		**TOTAL**		**TOTAL**							
2,0	**0,5**	**0,0**	**0,0**	**0,0**	**0,0**						
Total kVA		**Total kVA**		**Total kVA**		Intermitent Load with Coincidence Factor					
2,1		**0**		**0,0**		**0,0**	**0,0**				
0,97 pf						Stand-By Load with Coincidence Factor					
50 Amp		**0**		**0**		**0,0**	**0,0**				

Board Rating:

Peak Load (Amp):	50
Board Bar Capacity (Amp):	**250**
Board Bar Spare Capacity (Amp):	80%

ROSETTI MARINO

ELECTRICAL LOAD LIST

Equipment: AC UPS - PAS (CCS / SIS / DCS / Field Instruments)

Tag: UP-200F3

OPERATION MODE: (CCS MODE 4A : 'EMERGENCY MODE (Island'')

CROSSWIND

Project: HOLLANDSE KUST NOORD WIND PARK Project

Contract No. CW-I-WP4-2023-05

Doc. #: 123A90-DDL-EL-LIS-20146

Rev. 03 | **Sheet:** 12 of 14

	Tag Number	Description	Load Type	Branch Type	Essential	Normal	Vital	Re-start	Duty	Voltage	Voltage Type	(U) Utility Factor	(A) Absorbed Power @ 100% load (Mechanical kW in case of Motors))		(B) Nameplate Apparatus Rating (Mechanical kW in case of Motors)		(C) Utilization Factor	(D) Efficiency @ 100% Load	(E) Power Factor @ 100% Load	(G) Consumed Power: Continuous Load		(G) Consumed Power: Intermittent Load		(G) Consumed Power: Stand-By Load		Additional Information: Data Source	Schematic Control Type	WBS (Location)	Upper Source (Board Tag)	Remarks	Rev
										(V)		%	Value	Unit	Value	Unit	(pu)	(pu)	(pu)	(kW)	(kVAr)	(kW)	(kVAr)	(kW)	(kVAr)					
1	B400-SIS-001	SIS -Controller and I/O Cabinet - Line A	F	Feeder			x		C	230	S	100%	0,916	kW	1,00	kW	0,92	1,00	0,80	0,92	0,69					FF					03
2	B400-SIS-001	SIS -Controller and I/O Cabinet - Line B	F	Feeder			x		S	230	S	100%	0,916	kW	1,00	kW	0,92	1,00	0,80					0,92	0,69	FF					03
3	B400-PCS-001	PCS -Controller and I/O Cabinet - Line A	F	Feeder			x		C	230	S	100%	1,168	kW	1,50	kW	0,78	1,00	0,80	1,17	0,88					FF					03
4	B400-PCS-001	PCS -Controller and I/O Cabinet - Line B	F	Feeder			x		S	230	S	100%	1,168	kW	1,50	kW	0,78	1,00	0,80					1,17	0,88	FF					03
5	B400-EMCS-001	EMCS -Controller and I/O Cabinet - Line A	F	Feeder			x		C	230	S	100%	0,498	kW	1,00	kW	0,50	1,00	0,80	0,50	0,37					FF					03
6	B400-EMCS-001	EMCS -Controller and I/O Cabinet - Line B	F	Feeder			x		S	230	S	100%	0,498	kW	1,00	kW	0,50	1,00	0,80					0,50	0,37	FF					03
7	B400-SRV-001	Server Cabinet ITER - Line A	F	Feeder			x		C	230	S	100%	0,727	kW	2,00	kW	0,36	1,00	0,80	0,73	0,55					FF					03
8	B400-SRV-001	Server Cabinet ITER - Line B	F	Feeder			x		S	230	S	100%	0,727	kW	2,00	kW	0,36	1,00	0,80					0,73	0,55	FF					03
9	Spare	Spare	F	Feeder			x		Sp	230	S	100%			1,00	kW			0,80												03
10	Spare	Spare	F	Feeder			x		Sp	230	S	100%			0,50	kW			0,80												03
11																															
12	CP-630E1	UCP - Instrument Air Package -A-63000	F	Feeder			x		C	230	S	100%	1,0	kW	1,50	kW	0,67	1,00	1,00	1,00	0,00					FF					03
13	CP-640E1	UCP - N_2 Package	F	Feeder			x		C	230	S	100%	1,0	kW	1,50	kW	0,67	1,00	1,00	1,00	0,00					FF					03
14	JB-500F8	UCP - Water Package	F	Feeder			x		C	230	S	100%	2,0	kW	2,00	kW	1,00	1,00	0,90	2,00	0,97					FF					03
15	B100-HSB-001	UCP - HVAC HV Room	F	Feeder			x		C	230	S	100%	0,5	kW	0,7	kW	0,71	1,00	0,80	0,50	0,38					FF					03
16	B200-HSB-001	UCP - HVAC LV Room	F	Feeder			x		C	230	S	100%	0,5	kW	0,7	kW	0,71	1,00	0,80	0,50	0,38					FF					03
17	B300-HSB-001	UCP - HVAC UPS Room	F	Feeder			x		C	230	S	100%	0,5	kW	0,7	kW	0,71	1,00	0,80	0,50	0,38					FF					03
18	B400-HSB-001	UCP - HVAC ITER	F	Feeder			x		C	230	S	100%	0,5	kW	0,7	kW	0,71	1,00	0,80	0,50	0,38					FF					03
19																															
20	Spare	Spare	F	Feeder						230	S				5,00	kW															02
21	Spare	Spare	F	Feeder						230	S				5,00	kW															03
22	Spare	Spare	F	Feeder						230	S				5,00	kW															03
23	SG-200N1	LV Switchboard Auxiliary	F	Feeder	x				I	230	S	100%	0,6	kW	1,00	kW	0,59	1,00	0,80			0,59	0,44			FF					03
24	SG-200D2	LV Switchboard 800/460V Auxiliary	F	Feeder	x				I	230	S	100%	0,4	kW	0,50	kW	0,71	1,00	0,80			0,36	0,27			FF					03
25																															
26																															
27																															
28																															
29																															
30																															
31																															
32																															
33																															
34																															
35																															
36																															
37																															
38																															
39																															
40																															
41																															
42																															
43																															
44																															
45																															

Board Demand Factor:

Ratio of the Peak demand to the total connected load (including allowance factors): 53,4%

No. of Connected Motors: 0

No. of Motors Running Continuously: 0

Σ Motor Running Name Plate Ratings (kW): 0

Utilization Factor for Motors :

Motor Rating	% Pump Power	Utilisation
< 22 kW	125	**0,80**
22 to 55 kW	115	**0,87**
> 55 kW	110	**0,91**

Load Criticality:

- Essential
- Normal
- Vital
- Restart

Duty:

C = Continuous (X) =	100%
I = Intermittent (Y) =	30%
S = Stand-By (Z) =	10%
Sp = Spare =	0%

Coincidence or "Diversity Factors" X, Y and Z are applied to the different loads to establish the normal running load and peak load.

Contingency Allowance Factor =	0%
Planned Growth Allowance Factor =	15%

Bus Bar Voltage: 400 **V,** 50 **Hz**

Observations:

1) Generated, stored and exported power values are shown as negative values.

2) Spare feeders/drawers/cubicles shall be included in the above list, in order to be considered during the board dimensioning.

	CONTINUOUS		INTERMITTENT		STAND-BY				NORMAL RUNNING		PEAK LOAD	
	kW	kVAr	kW	kVAr	kW	kVAr	kW	kVAr	kW	kVAr	kW	kVAr
	9,3	5,0	0,9	0,7	3,3	2,5	Single Largest Intermitent Load		11,3	6,1	12,46	7,01
	CONTINGENCY ALLOWANCE		CONTINGENCY ALLOWANCE		CONTINGENCY ALLOWANCE		0,6	0,4	Total kVA		Total kVA	
	0,0	0,0	0,0	0,0	0,0	0,0	Single Largest Stand-By Load		12,9		14,3	
	GROWTH ALLOWANCE		GROWTH ALLOWANCE		GROWTH ALLOWANCE		1,2	0,9	0,88 pf		0,87 pf	
	1,4	0,7	0,1	0,1	0,5	0,4			19 Amp		21 Amp	
	TOTAL		TOTAL		TOTAL							
	10,7	5,7	1,1	0,8	3,8	2,9						
	Total kVA		Total kVA		Total kVA		Intermitent Load with Coincidence Factor					
	12,1		1		4,8		0,3	0,2				
	0,88 pf		0,80 pf		0,80 pf		Stand-By Load with Coincidence Factor					
	18 Amp		2 Amp		7 Amp		0,4	0,3				

Board Rating:

Peak Load (Amp):	21
Board Bar Capacity (Amp):	**63**
Board Bar Spare Capacity (Amp):	67%

ROSETTI MARINO

ELECTRICAL LOAD LIST

Equipment: AC UPS - FIRE & GAS

Tag: UP-200F4

OPERATION MODE: (CCS MODE 4A : 'EMERGENCY MODE (Island'')

CROSSWIND

Project: HOLLANDSE KUST NOORD WIND PARK Project

Contract No. CW-I-WP4-2023-05

Doc. #: 123A90-DDL-EL-LIS-20146

Rev. 03 | **Sheet:** 13 of 14

	User Input																	**(G) Consumed Power**						**Additional Information**					
	Tag Number	**Description**	**Load Type**	**Branch Type**	**Essential**	**Normal**	**Vital**	**Re-start**	**Duty**	**Voltage**	**Voltage Type**	**(U) Utility Factor**	**(A) Absorbed Power @ 100% load (Mechanical kW in case of Motors))**		**(B) Nameplate Apparatus Rating (Mechanical kW in case of Motors)**		**(C) Utilization Factor**	**(D) Efficiency @ 100% Load**	**(E) Power Factor @ 100% Load**	**Continuous Load**		**Intermittent Load**		**Stand-By Load**		**Data Source**	**Schematic Control Type**	**WBS (Location)**	**Upper Source (Board Tag)**	**Remarks**	**Rev**
										(V)		%	Value	Unit	Value	Unit	(pu)	(pu)	(pu)	(kW)	(kVAr)	(kW)	(kVAr)	(kW)	(kVAr)						
1	B400-FGS-001	FGS Fire & Gas Panel - Line A	F	Feeder			x		C	230	S	100%	1,377	kW	2,0	kW	0,69	1,00	0,80	1,38	1,03					FF					03
2	B400-FGS-001	FGS Fire & Gas Panel - Line B	F	Feeder			x		S	230	S	100%	1,377	kW	2,0	kW	0,69	1,00	0,80					1,38	1,03	FF					03
3	B400-NET-001	System Server / Network Cabinet - Line A	F	Feeder			x		C	230	S	100%	0,871	kW	1,00	kW	0,87	1,00	0,80	0,87	0,65					FF					03
4	B400-NET-001	System Server / Network Cabinet - Line B	F	Feeder			x		S	230	S	100%	0,871	kW	1,00	kW	0,87	1,00	0,80					0,87	0,65	FF					03
5																															
6	Spare	Spare	F	Feeder											1,00	kW															01
7	Spare	Spare	F	Feeder											2,00	kW															01
8	Spare	Spare	F	Feeder											2,00	kW															01
9	Spare	Spare	F	Feeder											2,00	kW															01
10																															
11																															
12																															
13																															
14																															
15																															
16																															
17																															
18																															
19																															
20																															
21																															
22																															
23																															
24																															
25																															
26																															
27																															
28																															
29																															
30																															
31																															
32																															
33																															
34																															
35																															
36																															
37																															
38																															
39																															
40																															
41																															
42																															
43																															
44																															
45																															

Board Demand Factor:

Ratio of the Peak demand to the total connected load (including allowance factors):	57,4%
No. of Connected Motors:	0
No. of Motors Running Continuously:	0
Σ Motor Running Name Plate Ratings (kW):	0

Utilization Factor for Motors :

Motor Rating	% Pump Power	Utilisation
< 22 kW	125	**0,80**
22 to 55 kW	115	**0,87**
> 55 kW	110	**0,91**

Load Criticality:

- Essential
- Normal
- Vital
- Restart

Duty:

C = Continuous (X) =	100%
I = Intermittent (Y) =	30%
S = Stand-By (Z) =	10%
Sp = Spare =	0%

Coincidence or "Diversity Factors" X, Y and Z are applied to the different loads to establish the normal running load and peak load.

Contingency Allowance Factor =	0%
Planned Growth Allowance Factor =	15%

Bus Bar Voltage: 400 **V,** 50 **Hz**

Observations:

1) Generated, stored and exported power values are shown as negative values.

2) Spare feeders/drawers/cubicles shall be included in the above list, in order to be considered during the board dimensioning.

	CONTINUOUS		*INTERMITTENT*		*STAND-BY*				*NORMAL RUNNING*		*PEAK LOAD*	
	kW	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**
	2,2	**1,7**	**0,0**	**0,0**	**2,2**	**1,7**	Single Largest Intermitent Load		**2,6**	**1,9**	**3,96**	**2,97**
	CONTINGENCY ALLOWANCE		CONTINGENCY ALLOWANCE		CONTINGENCY ALLOWANCE		**0,0**	**0,0**	**Total kVA**		**Total kVA**	
	0,0	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	Single Largest Stand-By Load		**3,2**		**5,0**	
	GROWTH ALLOWANCE		GROWTH ALLOWANCE		GROWTH ALLOWANCE		**1,4**	**1,0**	**0,80 pf**		**0,80 pf**	
	0,3	**0,3**	**0,0**	**0,0**	**0,3**	**0,3**			**5 Amp**		**7 Amp**	
	TOTAL		**TOTAL**		**TOTAL**							
	2,6	**1,9**	**0,0**	**0,0**	**2,6**	**1,9**						
	Total kVA		**Total kVA**		**Total kVA**		Intermitent Load with Coincidence Factor					
	3,2		**0**		**3,2**		**0,0**	**0,0**				
	0,80 pf				**0,80 pf**		Stand-By Load with Coincidence Factor					
	5 Amp		**0**		**5 Amp**		**0,3**	**0,2**				

Board Rating:

Peak Load (Amp):	7
Board Bar Capacity (Amp):	**32**
Board Bar Spare Capacity (Amp):	78%

ROSETTI MARINO

ELECTRICAL LOAD LIST

DISTRIBUTION BOARD: Lighting & Small Power BoP

Tag: DP-200N1

OPERATION MODE: (CCS MODE 4A : 'EMERGENCY MODE (Island'')

CROSSWIND

Project: HOLLANDSE KUST NOORD WIND PARK Project

Contract No. CW-I-WP4-2023-05

Doc. #: 123A90-DDL-EL-LIS-20146

Rev. 03 | **Sheet:** 14 of 14

	User Input																		**(G) Consumed Power**						**Additional Information**					
	Tag Number	**Description**	**Load Type**	**Branch Type**	**Essential**	**Normal**	**Vital**	**Re-start**	**Duty**	**Voltage**	**Voltage Type**	**(U) Utility Factor**	**(A) Absorbed Power @ 100% load (Mechanical kW in case of Motors))**		**(B) Nameplate Apparatus Rating (Mechanical kW in case of Motors)**		**(C) Utilization Factor**	**(D) Efficiency @ 100% Load**	**(E) Power Factor @ 100% Load**	**Continuous Load**		**Intermittent Load**		**Stand-By Load**		**Data Source**	**Schematic Control Type**	**WBS (Location)**	**Upper Source (Board Tag)**	**Remarks**	**Rev**
										(V)		%	Value	Unit	Value	Unit	(pu)	(pu)	(pu)	(kW)	(kVAr)	(kW)	(kVAr)	(kW)	(kVAr)						
1	EJB-200N1-02-L1-01	Normal Lighting Upper Deck	F	Feeder		x			C	230	S	100%	1,13	kW	1,50	kW	0,75	0,90	0,95	1,25	0,41					FD					03
2	EJB-200N1-03-L2-01	Normal Lighting Lower Deck	F	Feeder		x			C	230	S	100%	0,72	kW	1,00	kW	0,72	0,90	0,95	0,80	0,26					FD					03
3	EJB-200N1-04-L3-01	Normal Lighting stairs	F	Feeder		x			C	230	S	100%	0,09	kW	0,20	kW	0,45	0,90	0,95	0,10	0,03					FD					03
4	ESO-200N1-05-L1-01	Small Power Socket (Upper Deck)	F	Feeder		x			S	230	S	100%	2,50	kW	3,00	kW	0,83	0,90	0,80					2,78	2,08	FD					03
5	ESO-200N1-06-L2-01	Small Power Socket (Lower Deck)	F	Feeder		x			S	230	S	100%	2,50	kW	3,00	kW	0,83	0,90	0,80					2,78	2,08	FD					03
6	Spare	Spare	F	Feeder		x			Sp	230	S	100%			0,726	kW															03
7	EJB-200N1-08-L1-04	Emergency Lighting Upper Deck	F	Feeder		x		x	C	230	S	100%	0,92	kW	1,50	kW	0,61	0,90	0,95	1,02	0,34					FD					03
8	EJB-200N1-09-L2-01	Emergency Lighting Lower Deck	F	Feeder		x		x	C	230	S	100%	1,00	kW	1,50	kW	0,67	0,90	0,95	1,11	0,37					FD					03
9	EJB-200N1-10-L3-01	Emergency Lighting stairs	F	Feeder		x		x	C	230	S	100%	0,52	kW	1,00	kW	0,52	0,90	0,95	0,58	0,19					FD					03
12	ETB-200N1-14-L1-01	Trace Heating - Process Lines - Feeder 1 (SWS LINES)	H	Feeder		x			I	230	S	100%	1,50	kW	3,50	kW	0,43	0,95	1,00			1,58	0,00			FD					03
13	ETB-200N1-15-L2-01	Trace Heating - Process Lines - Feeder 2 (CI LINES)	H	Feeder		x			I	230	S	100%	1,50	kW	3,50	kW	0,43	0,95	1,00			1,58	0,00			FD					03
14	ETB-200N1-16-L3-01	Trace Heating - Process Lines - Feeder 3 (DM LINE)	H	Feeder		x			I	230	S	100%	1,50	kW	3,50	kW	0,43	0,95	1,00			1,58	0,00			FD					03
15	ETB-200N1-17-L1-01	Trace Heating - Process Lines - Feeder 4 (WW LINES)	H	Feeder		x			I	230	S	100%	1,50	kW	3,50	kW	0,43	0,95	1,00			1,58	0,00			FD					03
16	ETB-200N1-18-L2-01	Trace Heating - Feeder 5 (VESSEL KO DRUM)	H	Feeder		x			I	230	S	100%	1,50	kW	3,50	kW	0,43	0,95	1,00			1,58	0,00			FD					03
17	ETB-200N1-19-L3-01	Trace Heating - Feeder 6 (H2 VENT)	H	Feeder		x			I	230	S	100%	1,00	kW	2,50	kW	0,40	0,95	1,00			1,05	0,00			FD					03
18	ETB-200N1-20-L1-01	Trace Heating - Feeder 7 (SEA WATER PUMPS)	H	Feeder		x			I	230	S	100%	1,00	kW	2,50	kW	0,40	0,95	1,00			1,05	0,00			FD					03
19																															03
43	Spare	Trace Heating - SPARE	H	Feeder		x			Sp	230	S	100%	3,50	kW	3,50	kW	1,00	0,95	1,00												02
20	B400-SIS-001	SIS -Controller and I/O Cabinet - Auxiliary	F	Feeder		x			S	230	S	100%	0,137	kW	0,50	kW	0,27	1,00	0,80					0,14	0,10	FF					03
21	B400-PCS-001	PCS -Controller and I/O Cabinet - Auxiliary	F	Feeder		x			S	230	S	100%	0,144	kW	0,50	kW	0,29	1,00	0,80					0,14	0,11	FF					03
22	B400-EMCS-001	EMCS -Controller and I/O Cabinet - Auxiliary	F	Feeder		x			S	230	S	100%	0,137	kW	0,50	kW	0,27	1,00	0,80					0,14	0,10	FF					03
23	B400-FGS-001	FGS Fire & Gas Panel - Auxiliary	F	Feeder		x			S	230	S	100%	0,15	kW	0,50	kW	0,30	1,00	0,80					0,15	0,11	FF					03
24	B400-NET-001	System Server / Network Cabinet - Auxiliary	F	Feeder		x			S	230	S	100%	0,14	kW	0,5	kW	0,27	1,00	0,80					0,14	0,10	FF					03
25	B400-SRV-001	Server cabiner ITER - Auxiliary	F	Feeder		x			S	230	S	100%	0,130	kW	0,5	kW	0,26	1,00	0,80					0,13	0,10	FF					03
26	CP-630E1	UCP - Instrument Air Package -A-63000 - Auxiliary	F	Feeder		x		x	S	230	S	100%	0,5	kW	0,50	kW	1,00	1,00	0,80					0,50	0,38	FF					03
27	CP-640E1	UCP - N_2 Package - Auxiliary	F	Feeder		x		x	S	230	S	100%	0,5	kW	0,50	kW	1,00	1,00	0,80					0,50	0,38	FF					03
28	CP-100E2	Auxiliary Trafo OLTC	F	Feeder		x		x	I	400	TN	100%	1,0	kW	1,0	kW	1,00	1,00	0,80			1,00	0,75			FF					03
29	CP-100E3	Auxiliary Trafo AVR	F	Feeder		x		x	I	230	S	100%	0,3	kW	0,3	kW	1,00	1,00	0,80			0,30	0,23			FF					03
30	CP-100E4	Auxiliary Trafo 7MVA	F	Feeder		x		x	I	230	S	100%	0,5	kW	0,5	kW	1,00	1,00	0,80			0,50	0,38			FF					03
31	RR-100D1	Auxiliary NER	F	Feeder		x		x	S	230	S	100%	0,3	kW	0,3	kW	1,00	1,00	0,80					0,30	0,23	FF					03
32	CP-200E1	Auxiliary Trafo 1,6MVA	F	Feeder		x		x	I	230	S	100%	0,5	kW	0,5	kW	1,00	1,00	0,80			0,50	0,38			FF					03
33	CP-200E2	Auxiliary Trafo SOLARE 0,5MVA	F	Feeder		x		x	I	230	S	100%	0,5	kW	0,5	kW	1,00	1,00	0,80			0,50	0,38			FF					03
34	CP-100E1	Auxiliary GIS	F	Feeder		x		x	C	230	S	100%	0,5	kW	3,0	kW	0,17	1,00	0,80	0,50	0,38					FF					03
35	SG-100D1	Auxiliary 6.6kV Switchboard	F	Feeder		x		x	I	230	S	100%	1,3	kW	1,5	kW	0,88	1,00	0,80			1,32	0,99			FF					03
36	SG-200N1	LV Switchboard Auxiliary	F	Feeder		x		x	I	230	S	100%	0,9	kW	1,0	kW	0,88	1,00	0,80			0,88	0,66			FF					03
37	SG-200D2	LV Switchboard 800/460V Auxiliary	F	Feeder		x		x	I	230	S	100%	0,2	kW	0,5	kW	0,37	1,00	0,80			0,19	0,14			FF					03
38	UP-200F3	AC UPS PAS AUXILIARY	F	Feeder		x		x	S	230	S	100%	0,5	kW	0,5	kW	0,90	1,00	0,80					0,45	0,34	FF					03
39	UP-200F4	AC UPS F&G AUXILIARY	F	Feeder		x		x	S	230	S	100%	0,5	kW	0,5	kW	0,90	1,00	0,80					0,45	0,34	FF					03
40	UP-200F1	DC BATTERY SYSTEM AUXILIARY	F	Feeder		x		x	S	230	S	100%	0,3	kW	0,3	kW	1,00	1,00	0,80					0,30	0,23	FF					03
41	Spare	Normal Lighting - SPARE	F	Feeder		x			Sp	230	S	100%	1,00	kW	1,00	kW	1,00	0,90	0,95												01
42	Spare	Emergency Lighting - SPARE	F	Feeder		x			Sp	230	S	100%	1,40	kW	1,50	kW	0,93	0,90	0,95												01
43	Spare	INS Cabinet - SPARE Auxiliary	F	Feeder		x			Sp	230	S	100%	0,3	kW	0,5	kW	0,60	0,95	0,80												01
44																															01
45	Spare	Spare	F	Feeder		x			Sp	230	S				3,00	kW															01
46	Spare	Spare	F	Feeder		x			Sp	230	S				1,00	kW															01
47	Spare	Spare	F	Feeder		x			Sp	400	TN				3,00	kW															01

Board Demand Factor:

Ratio of the Peak demand to the total connected load (including allowance factors): 20,8%

No. of Connected Motors: 0

No. of Motors Running Continuously: 0

Σ Motor Running Name Plate Ratings (kW): 0

Utilization Factor for Motors :

Motor Rating	% Pump Power	Utilisation
< 22 kW	125	**0,80**
22 to 55 kW	115	**0,87**
> 55 kW	110	**0,91**

Load Criticality:

- Essential
- Normal
- Vital
- Restart

Duty:

C = Continuous (X) =	100%	Coincidence or "Diversity Factors" X, Y and Z are applied to the different loads to establish the normal running load and peak load.
I = Intermittent (Y) =	30%	
S = Stand-By (Z) =	10%	
Sp = Spare =	0%	

Contingency Allowance Factor =	0%
Planned Growth Allowance Factor =	15%

Bus Bar Voltage: 400 V, 50 Hz

Observations:

1) Generated, stored and exported power values are shown as negative values.

2) Spare feeders/drawers/cubicles shall be included in the above list, in order to be considered during the board dimensioning.

	CONTINUOUS		*INTERMITTENT*		*STAND-BY*				*NORMAL RUNNING*		*PEAK LOAD*	
	kW	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**	**kW**	**kVAr**
	5,4	**2,0**	**15,2**	**3,9**	**8,9**	**6,7**	Single Largest Intermitent Load		**11,4**	**3,6**	**14,2**	**5,7**
	CONTINGENCY ALLOWANCE		CONTINGENCY ALLOWANCE		CONTINGENCY ALLOWANCE		**1,6**	**1,0**	**Total kVA**		**Total kVA**	
	0,0	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	Single Largest Stand-By Load		**12,0**		**15,3**	
	GROWTH ALLOWANCE		GROWTH ALLOWANCE		GROWTH ALLOWANCE		**2,8**	**2,1**	**0,95 pf**		**0,93 pf**	
	0,8	**0,3**	**2,3**	**0,6**	**1,3**	**1,0**			**17 Amp**		**22 Amp**	
	TOTAL		**TOTAL**		**TOTAL**							
	6,2	**2,3**	**17,5**	**4,5**	**10,2**	**7,7**						
	Total kVA		**Total kVA**		**Total kVA**		Intermitent Load with Coincidence Factor					
	6,6		**18**		**12,8**		**5,2**	**1,3**				
	0,94 pf		**0,97 pf**		**0,80 pf**		Stand-By Load with Coincidence Factor					
	9 Amp		**26 Amp**		**18 Amp**		**1,0**	**0,8**				

Board Rating:

Peak Load (Amp):	22
Board Bar Capacity (Amp):	**63**
Board Bar Spare Capacity (Amp):	65%