MARK	QTY.	MODIFICATION NO.	SIGN	DATE

DESIGNED	吴 潇	2016-10-30
CHECKED	谢 飓	2016-10-30
VERIFIED	左小明	2016-10-30
STANDARDIZED	加香君	2016-10-30
APPROVED	王永珊	2016-10-30

TAMPAMACHOCO

Electric Load Analysis

FINAL DRAWING

HULL NO.	H3077		
DRAWING NO.	H3077-056-002		
REV.	0	SCALE	
WEIGHT (kg)		PAGE	1/6

中船黄埔文冲船舶有限公司

CSSC HUANGPU WENCHONG SHIPBUILDING CO.LTD

210×297 AREA: 0.06m^2

ELECTRICAL LOAD CALCULATION

115M DIESEL ELECTRIC CONSTRUCTION SUPPORT VESSEL

JOB NO.:P-1700

CONTINUOUS LOAD

Group no.	Consumer	Motor KW	QTY	Total KW	Working condition																									
					Crusing		In port		Arrival/departure		Fi-Fi (without DP)		Construction (Bus bar A1+A2) Light DP		Construction (Bus bar B1+B2) Light DP		Construction (Bus bar A1+A2) Moderate DP		Construction (Bus bar B1+B2) Moderate DP		Construction (Bus bar A1+A2) Heavy DP		Construction (Bus bar B1+B2) Heavy DP		Construction with one engine room lost (Bus bar A1+A2)		Construction with one engine room lost (Bus bar B1+B2)		E-gen	
					Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW
1	**Azimuth&bow thruster&aux. consumers(Supplied from AC690V MSB)**																													
1.1	Port azimuth thruster	2500	1	2500	0.85	2125			0.4	1000	0.3	750	0.7	1750			0.7	1750			0.7	1750			0.8	2000				
1.2	Stbd azimuth thruster	2500	1	2500	0.85	2125			0.4	1000	0.3	750			0.7	1750			0.7	1750			0.7	1750			0.8	2000		
1.3	NO.1 tunnel thruster	1600	1	1600					0.9	1440	0.8	1280	1	1600			1	1600			1	1600			0.85	1360				
1.4	NO.2 tunnel thruster	1600	1	1600					0.9	1440	0.8	1280			1	1600			1	1600			1	1600			0.85	1360		
1.5	Retractable thruster	1600	1	1600									0.5	800	0.5	800	0.5	800	0.5	800	0.5	800	0.5	800	0.85	1360	0.85	1360		
1.6	Port azimuth thruster UGB lub. Oil pump	4.7	1	4.7	0.7	3.29			0.7	3.29	0.7	3.29	0.7	3.29			0.7	3.29			0.7	3.29			0.7	3.29				
1.7	Port azimuth thruster head pressure pump	0.21	1	0.5	0.7	0.35			0.7	0.35	0.7	0.35	0.7	0.35			0.7	0.35			0.7	0.35			0.7	0.35				
1.8	Port azimuth thruster steering hydraulic pump	89.2	2	178.4	0.4	71.36			0.4	71.36	0.4	71.36	0.4	71.36			0.4	71.36			0.4	71.36			0.4	71.36				
1.9	Port azimuth thruster pitch hydraulic pump	13.1	2	26.2	0.4	10.48			0.4	10.48	0.4	10.48	0.4	10.48			0.4	10.48			0.4	10.48			0.4	10.48				
1.10	Stbd azimuth thruster UGB lub. Oil pump	4.7	1	4.7	0.7	3.29			0.7	3.29	0.7	3.29			0.7	3.29			0.7	3.29			0.7	3.29			0.7	3.29		
1.11	Stbd azimuth thruster head pressure pump	0.21	1	0.5	0.7	0.35			0.7	0.35	0.7	0.35			0.7	0.35			0.7	0.35			0.7	0.35			0.7	0.35		
1.12	Stbd azimuth thruster steering hydraulic pump	89.2	2	178.4	0.4	71.36			0.4	71.36	0.4	71.36			0.4	71.36			0.4	71.36			0.4	71.36			0.4	71.36		
1.13	Stbd azimuth thruster pitch hydraulic pump	13.1	2	26.2	0.4	10.48			0.4	10.48	0.4	10.48			0.4	10.48			0.4	10.48			0.4	10.48			0.4	10.48		
1.14	Retractable thruster steering hydraulic pump	30	2	60									0.4	24	0.4	24	0.4	24	0.4	24	0.4	24	0.4	24	0.4	24	0.4	24		
1.15	Retractable thruster lub. Oil pump	0.55	1	0.55									0.8	0.44	0.8	0.44	0.8	0.44	0.8	0.44	0.8	0.44	0.8	0.44	0.8	0.44	0.8	0.44		
1.16	Tunnel thruster L.O. pump	4.7	2	9.4					0.8	7.52	0.8	7.52	0.4	3.76	0.4	3.76	0.4	3.76	0.4	3.76	0.4	3.008	0.4	3.008	0.4	3.76	0.4	3.76		
1.17	F.W. cooling pump for tunnel thruster	11	4	44					0.4	17.6	0.4	17.6	0.2	8.8	0.2	8.8	0.2	8.8	0.2	8.8	0.2	8.8	0.2	8.8	0.2	8.8	0.2	8.8		
1.18	F.W. cooling pump for retractable thruster	11	2	22									0.4	8.8	0.4	8.8	0.4	8.8	0.4	8.8	0.4	8.8	0.4	8.8	0.4	8.8	0.4	8.8		
1.19	S.W. cooling pump for tunnel thruster	7.5	4	30					0.4	12	0.4	12	0.2	6	0.2	6	0.2	6	0.2	6	0.2	6	0.2	6	0.2	6	0.2	6		
1.20	S.W. cooling pump for retractable thruster	7.5	2	15									0.4	6	0.4	6	0.4	6	0.4	6	0.4	6	0.4	6	0.4	6	0.4	6		
1.21	S.W. cooling pump for azimuth thruster(P)	7.5	2	15	0.4	6			0.4	6	0.4	6	0.4	6			0.4	6			0.4	6			0.4	6				
1.22	F.W. cooling pump for azimuth thruster(P)	11	2	22	0.4	8.8			0.4	8.8	0.4	8.8	0.4	8.8			0.4	8.8			0.4	8.8			0.4	8.8				
1.23	S.W. cooling pump for azimuth thruster(S)	7.5	2	15	0.4	6			0.4	6	0.4	6			0.4	6			0.4	6			0.4	6			0.4	6		
1.24	F.W. cooling pump for azimuth thruster(S)	11	2	22	0.4	8.8			0.4	8.8	0.4	8.8			0.4	8.8			0.4	8.8			0.4	8.8			0.4	8.8		
1.25	S.W. cooling pump for No.1&No.2 main gensets	30	2	60	0.4	24			0.4	24	0.4	24	0.4	24			0.4	24			0.4	24			0.4	24				
1.26	S.W. cooling pump for No.3&No.4 main gensets	30	2	60	0.4	24			0.4	24	0.4	24			0.4	24			0.4	24			0.4	24			0.4	24		
1.27	F.W. cooling pump for No.1 genset MDF&No.1 F.F. gear box	7.5	2	15	0.4	6			0.4	6	0.4	6	0.4	6			0.4	6			0.4	6			0.4	6				
1.28	F.W. cooling pump for No.2 genset MDF&No.1 LLC transformer	7.5	2	15	0.4	6			0.4	6	0.4	6	0.4	6			0.4	6			0.4	6			0.4	6				
1.29	F.W. cooling pump for No.3 genset MDF&No.2 LLC transformer	7.5	2	15	0.4	6			0.4	6	0.4	6			0.4	6			0.4	6			0.4	6			0.4	6		
1.30	F.W. cooling pump for No.4 genset MDF&No.2 F.F. gear box	7.5	2	15	0.4	6			0.4	6	0.4	6			0.4	6			0.4	6			0.4	6			0.4	6		
1.31	*Anti-heeling pump	178	2	356													0.3	106.8	0.3	106.8	0.3	106.8	0.3	106.8						
1.32	*Main crane	400	1	400																	0.7	280								
1.33	*50T telescopic crane	400	1	400															0.7	280										
1.34	Telescopic access bridge	92	2	184											0.8	147.2														
1.35	Anchor windlass/mooring winch hydraulic pump	55	2	110					0.8	88																				
1.36	B/T compt 3 exhaust fan	7.5	1	7.5									0.7	5.25			0.7	5.25			0.7	5.25			0.7	8.82				
1.37	B/T compt 3 supply fan	7.5	1	7.5											0.7	5.25			0.7	5.25			0.7	5.25			0.7	8.82		
	Total AC690V CONTINUOUS LOAD for each condition				**4522.56**		**0**		**5277.68**		**4369.68**		**4349.33**		**4496.53**		**4456.13**		**4736.13**		**4735.378**		**4455.378**		**4922.9**		**4922.9**			
	Engine room&aux. consumers(Supplied from AC440V MSB)																													
2	E/R Aux Machinery																													

Group no.	Consumer	Motor KW	QTY	Total KW	Working condition																									
					Crusing		In port		Arrival/departure		Fi-Fi (without DP)		Construction (Bus bar A1+A2) Light DP		Construction (Bus bar B1+B2) Light DP		Construction (Bus bar A1+A2) Moderate DP		Construction (Bus bar B1+B2) Moderate DP		Construction (Bus bar A1+A2) Heavy DP		Construction (Bus bar B1+B2) Heavy DP		Construction with one engine room lost (Bus bar A1+A2)		Construction with one engine room lost (Bus bar B1+B2)		E-gen	
					Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW
2.1	*SW cooling pump for central air conditioner	43	2	86	0.6	51.6	0.5	43	0.6	51.6	0.6	51.6	0.3	25.8	0.3	25.8	0.3	25.8	0.3	25.8	0.3	15.48	0.3	15.48						
2.2	*S.W. cooling pump for AC-REF plant	8.6	2	17.2	0.4	6.88	0.4	6.88	0.4	6.88	0.4	6.88	0.4	6.88	0.4	6.88	0.4	6.88	0.4	6.88	0.4	6.88	0.4	6.88						
2.3	*S.W. cooling pump for ECR AC unit	8.6	2	17.2	0.7	12.04	0.6	10.32	0.7	12.04	0.7	12.04	0.35	6.02	0.35	6.02	0.35	6.02	0.35	6.02	0.35	6.02	0.35	6.02	0.35	6.02	0.35	6.02		
2.4	Elevator lift	7.5	1	7.5	0.7	5.25	0.7	5.25	0.7	5.25	0.7	5.25			0.6	4.5			0.6	4.5			0.6	4.5			0.6	4.5	1	7.5
2.5	*Working air compressor	62	2	124	0.4	49.6	0.4	49.6	0.4	49.6	0.4	49.6	0.2	24.8	0.2	24.8	0.2	24.8	0.2	24.8	0.2	24.8	0.2	24.8						
3	Air-condition																													
3.1	*No.1 AHU control panel	153.5	1	153.5																										
3.2	*No.2 AHU control panel	195	1	195	0.6	117	0.3	58.5	0.6	117	0.6	117	0.6	117			0.6	117			0.6	117								
3.3	*No.3 AHU control panel	270	1	270	0.6	162	0.3	81	0.6	162	0.6	162	0.6	162			0.6	162			0.6	162								
3.4	*No.4 AHU control panel	168.5	1	168.5																										
3.5	*Air condition chilled water pump	30	3	90	0.25	22.5	0.25	22.5	0.25	22.5	0.25	22.5			0.25	22.5			0.25	22.5			0.25	22.5						
3.6	*NO.1 chiller unit	371.6	1	371.6																										
3.7	*NO.2 chiller unit	371.6	1	371.6	0.6	222.96	0.3	111.5	0.6	222.96	0.6	222.96			0.6	222.96			0.6	222.96			0.6	222.96						
3.8	ECR AC unit	7.7	4	30.8	0.7	21.56			0.7	21.56	0.7	21.56	0.35	10.78	0.35	10.78	0.35	10.78	0.35	10.78	0.35	10.78	0.35	10.78	0.35	10.78	0.35	10.78		
3.9	*W/H air conditioning unit	5	4	20	0.7	14			0.7	14	0.7	14	0.35	7	0.35	7	0.35	7	0.35	7	0.35	7	0.35	7						
3.10	*Galley air conditioning unit	33	1	33	0.7	23.1			0.7	23.1	0.7	23.1	0.7	23.1			0.7	23.1			0.7	23.1								
4	Ventilation Fan																													
4.1	Aimuth thruster room supply fan	2.2	2	4.4	0.8	3.52			0.8	3.52	0.8	3.52	0.4	1.76	0.4	1.76	0.4	1.76	0.4	1.76	0.4	1.76	0.4	1.76	0.35	1.54	0.35	1.54		
4.2	Azimuth thruster room exhaust fan	2.2	2	4.4	0.8	3.52			0.8	3.52	0.8	3.52	0.4	1.76	0.4	1.76	0.4	1.76	0.4	1.76	0.4	1.76	0.4	1.76	0.35	1.54	0.35	1.54		
4.3	No.1 E/R fan(supply/reversible)	34.5	2	69	0.8	55.2	0.4	27.6	0.8	55.2	0.8	55.2	0.4	27.6	0.4	27.6	0.4	27.6	0.4	27.6	0.4	27.6	0.4	27.6	0.4	27.6	0.4	27.6		
4.4	**No.2 E/R fan(supply/reversible)	34.5	2	69	0.8	55.2	0.4	27.6	0.8	55.2	0.8	55.2	0.4	27.6	0.4	27.6	0.4	27.6	0.4	27.6	0.4	27.6	0.4	27.6	0.4	27.6	0.4	27.6		
4.5	Corridor exhaust fan	1.5	4	6	0.7	4.2			0.7	4.2	0.8	4.8	0.4	2.4	0.4	N	0.4	2.4	0.4	2.4	0.4	2.4	0.4	2.4	0.4	2.4	0.4	2.4		
4.6	B/T compt 1 supply fan	1.5	1	1.5					0.6	0.9	0.6	0.9	0.8	1.2			0.8	1.2			0.8	1.2			0.8	1.2				
4.7	B/T compt 1 exhaust fan	1.5	1	1.5					0.6	0.9	0.6	0.9	0.8	1.2			0.8	1.2			0.8	1.2			0.8	1.2				
4.8	Em'cy gen. room supply fan	1.5	1	1.5																									1	1.5
4.9	Corridor supply fan	1.5	4	6	0.7	4.2			0.7	4.2	0.8	4.8	0.4	2.4	0.4	N	0.4	2.4	0.4	2.4	0.4	2.4	0.4	2.4	0.4	2.4	0.4	2.4		
4.10	B/T compt 2 supply fan	6.33	1	6.33					0.6	3.798	0.6	3.798			0.7	4.431			0.7	4.431			0.7	4.431			0.7	4.431		
4.11	B/T compt 2 exhaust fan	6.33	1	6.33					0.6	3.798	0.6	3.798			0.7	4.431			0.7	4.431			0.7	4.431			0.7	4.431		
4.12	Store supply fan	2.2	2	4.4	0.7	3.08			0.7	3.08	0.8	3.52	0.35	1.54	0.35	1.54	0.35	1.54	0.35	1.54	0.35	1.54	0.35	1.54	0.35	1.54	0.35	1.54		
4.13	Galley exhaust fan	3.5	1	3.5	0.7	2.45			0.7	2.45	0.8	2.8	0.7	2.45			0.7	2.45			0.7	2.45			0.6	2.1				
4.14	Pax changing rm exhaust fan	0.63	1	0.63	0.8	0.504			0.8	0.504	0.8	0.504	0.7	0.441			0.7	0.441			0.7	0.441			0.6	0.378				
4.15	Incinerator/garbage rm supply fan	2.2	1	2.2	0.8	1.76	0.8	1.408	0.8	1.76	0.8	1.76	0.7	1.54			0.7	1.54			0.7	1.54			0.6	1.32				
4.16																														
4.17	Bosun store supply fan	1.5	1	1.5	0.8	1.2	0.8	0.96	0.8	1.2	0.8	1.2	0.7	1.05			0.7	1.05			0.7	1.05			0.6	0.9				
4.18																														
4.19	Hipap rm supply fan	2.2	2	4.4									0.3	3.3	0.3	3.3	0.3	1.32	0.3	1.32	0.3	3.3	0.3	3.3	0.3	3.3	0.3	3.3		
4.20	Staircase exhaust fan	0.63	2	1.26	0.7	0.882	0.6	0.529	0.7	0.882	0.8	1.008	0.35	0.441	0.35	0.441	0.35	0.441	0.35	0.441	0.35	0.441	0.35	0.441	0.35	0.441	0.35	0.441		
4.21	Laundry exhaust fan	0.63	1	0.63	0.7	2.45			0.7	2.45	0.8	2.8	0.7	2.45			0.7	2.45			0.7	2.45			0.6	2.1				
5	Miscellaneous(AC440V)																													
5.1	3rd fire pump	35	1	35																									1	35

Group no.	Consumer	Motor KW	QTY	Total KW	Working condition																									
					Crusing		In port		Arrival/departure		Fi-Fi (without DP)		Construction (Bus bar A1+A2) Light DP		Construction (Bus bar B1+B2) Light DP		Construction (Bus bar A1+A2) Moderate DP		Construction (Bus bar B1+B2) Moderate DP		Construction (Bus bar A1+A2) Heavy DP		Construction (Bus bar B1+B2) Heavy DP		Construction with one engine room lost (Bus bar A1+A2)		Construction with one engine room lost (Bus bar B1+B2)		E-gen	
					Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW
5.2	AMS UPS	9	2	18	0.4	7.2			0.4	7.2	0.4	7.2	0.2	3.6	0.2	3.6	0.2	3.6	0.2	3.6	0.2	3.6	0.2	3.6	0.2	3.6	0.2	3.6		
5.3	*Socket for reefer container	11	4	44	0.7	30.8			0.7	30.8			0.4	17.6	0.4	17.6	0.4	17.6	0.4	17.6	0.4	17.6	0.4	17.6						
5.4	Water sprinkler system	38.2	2	76.4																									0.5	38.2
5.5	Breathing air compressor	11	1	11							0.8	8.8																	1	11
5.6																														
5.7	AC110V power distribution board	16	2	32	0.6	19.2	0.5	16	0.6	19.2	0.6	19.2	0.3	9.6	0.3	9.6	0.3	9.6	0.3	9.6	0.3	9.6	0.3	9.6	0.1	3.2	0.1	3.2		
	Total AC440V CONTINUOUS LOAD for each condition				**903.856**		**462.6272**		**913.252**		**893.718**		**493.312**		**434.903**		**491.332**		**437.723**		**482.992**		**429.383**		**101.159**		**105.323**		**93.2**	
INTERMITTENT LOAD																														
6	E/R Aux Machinery(AC440V)																													
6.1	Starting air compressor	18	2	36	0.4	14.4	0.4	14.4	0.4	14.4	0.4	14.4	0.3	10.8	0.3	10.8	0.3	10.8	0.3	10.8	0.3	10.8	0.3	10.8	0.3	10.8	0.3	10.8	0.5	18
6.2	Bilge-ballast-fire-gs pump	110	2	220	0.3	66			0.3	66	0.3	66	0.2	44	0.2	44	0.2	44	0.2	44	0.2	44	0.2	44	0.2	44	0.2	44		
6.3	FO transfer pump	2.5	4	10	0.2	2			0.2	2	0.2	2	0.2	2	0.2	2	0.2	2	0.2	2	0.2	2	0.2	2	0.2	2	0.2	2		
6.4	*Incinerator	22	1	22	0.7	15.4	0.7	10.78	0.7	15.4	0.7	15.4	0.6	13.2			0.6	13.2			0.6	13.2								
6.5	Dirty oil / sludge pump	2.5	1	2.5			0.8	2																						
6.6	*FW pump-F.W. pressure set	8.6	6	51.6	0.6	30.96	0.4	20.64	0.6	30.96	0.6	30.96	0.3	15.48	0.3	15.48	0.3	15.48	0.3	15.48	0.3	15.48	0.3	15.48						
6.7	S.W. pressure set pump	3	2	6																										
6.8	Oily bilge separator	2.2	1	2.2	0.7	1.54			0.7	1.54	0.7	1.54			0.7	1.54			0.7	1.54			0.7	1.54			0.7	1.54		
6.9	*Sewage transfer pump	2.5	2	5	0.7	3.5	0.4	2	0.7	3.5	0.8	4	0.4	2	0.4	2	0.4	2	0.4	2	0.4	2	0.4	2						
6.1	*Sewage treatment plant	11.75	2	23.5	0.6	14.1	0.6	14.1	0.6	14.1	0.8	18.8	0.4	9.4	0.4	9.4	0.4	9.4	0.4	9.4	0.4	9.4	0.4	9.4						
6.11	*Fresh water generator	24.5	2	49	0.7	34.3					0.8	39.2	0.4	19.6	0.4	19.6	0.4	19.6	0.4	19.6	0.4	19.6	0.4	19.6						
6.12	Watertight door	1.5	12	18	0.4	7.2	0.4	7.2	0.4	7.2	0.4	7.2	0.4	7.2			0.4	7.2			0.4	7.2			0.4	7.2	0.4	7.2	0.5	9
6.13	*Calorifier	72	2	144	0.3	43.2	0.3	43.2	0.3	43.2	0.4	57.6	0.2	28.8	0.2	28.8	0.2	28.8	0.2	28.8	0.2	28.8	0.2	28.8						
6.14	*Hot water circulating pump	1.1	2	2.2	0.4	0.88	0.3	0.66	0.4	0.88	0.4	0.88	0.2	0.44	0.2	0.44	0.2	0.44	0.2	0.44	0.2	0.44	0.2	0.44						
6.15	Bilge pump	17	2	34	0.4	13.6			0.4	13.6	0.4	13.6			0.4	13.6			0.4	13.6			0.4	13.6	0.4	13.6	0.4	13.6	1	34
6.16	Daily bilge pump	4.6	1	4.6	0.4	1.84	0.4	1.84	0.4	1.84	0.4	1.84			0.4	1.84			0.4	1.84			0.4	1.84			0.4	1.84		
6.17	Ballast water management	27	1	27					0.7	18.9																				
6.18	Cooling water pre-heater for main gensets(3170KW)	30	2	60			0.2	12																						
6.19	Cooling water pre-heater for main gensets(2495KW)	27	2	54			0.2	10.8																						
6.20	Main genset pre-lub. oil pump(3170KW)	6.4	2	12.8			0.2	2.56																					0.5	6.4
6.21	Main genset pre-lub. oil pump(2495KW)	6.3	2	12.6			0.2	2.52																					0.5	6.3
6.22	LO purifier	30	2	60	0.6	36			0.6	36	0.6	36	0.3	18	0.3	18	0.3	18	0.3	18	0.3	18	0.3	18	0.3	18	0.3	18		
6.23	MDO purifier	5.5	2	11	0.6	6.6			0.6	6.6	0.6	6.6	0.3	3.3	0.3	3.3	0.3	3.3	0.3	3.3	0.3	1.98	0.3	1.98	0.3	3.3	0.3	3.3		
7	*Refrigeration plant (AC440V)	20	1	20	0.6	12	0.6	12	0.6	12	0.6	12	0.6	12			0.6	12			0.6	12								
8	*Galley equipment(AC440V)	197		197.2	0.3	59.16	0.3	59.16	0.4	78.88	0.4	78.88	0.4	78.88			0.4	78.88			0.4	78.88								
9	*Laundry equipment(AC440V)	233.3		233.3	0.3	69.99	0.3	69.99	0.3	69.99	0.3	69.99	0.3	69.99			0.3	69.99			0.3	69.99								

Group no.	Consumer	Motor KW	QTY	Total KW	Working condition																									
					Crusing		In port		Arrival/departure		Fi-Fi (without DP)		Construction (Bus bar A1+A2) Light DP		Construction (Bus bar B1+B2) Light DP		Construction (Bus bar A1+A2) Moderate DP		Construction (Bus bar B1+B2) Moderate DP		Construction (Bus bar A1+A2) Heavy DP		Construction (Bus bar B1+B2) Heavy DP		Construction with one engine room lost (Bus bar A1+A2)		Construction with one engine room lost (Bus bar B1+B2)		E-gen	
					Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW
10	Deck machinery(AC440V)																													
10.1	Davit for life boat	29.5	4	118																										
10.2	Davit for rescue boat	45	2	90							0.4	36																		
10.3																														
10.4	Davit for life raft	14	2	28																									1	28
10.5																														
11	Miscellaneous(AC440V)																													
11.1	Main genset turning gear motor(3170KW)	2.5	2	5			0.35	1.75																						
11.2	Main genset turning gear motor(2495KW)	0.9	2	1.8			0.35	0.63																						
11.3	*Electronic welder set	28	2	18											0.2	3.6			0.2	3.6			0.2	3.6						
11.4	E/R local water mist	2.2	1	2.2	0.5	1.1			0.8	1.76	0.5	1.1																		
11.5	Taut wire winch	21	1	21									0.7	14.7			0.7	14.7			0.7	14.7			0.7	14.7				
11.6	DP hipap hosit unit	1.1	1	1.1									0.4	0.44			0.4	0.44			0.4	0.44			0.4	0.44				
11.7	Hipap gate valve	5.5	2	11									0.3	3.3	0.3	3.3					0.3	3.3	0.3	3.3	0.3	3.3	0.3	3.3		
	Total AC440V <u>INTERMITTENT LOAD</u> for each condition				**433.77**		**288.23**		**438.75**		**513.99**		**353.53**		**177.7**		**350.23**		**174.4**		**352.21**		**176.38**		**117.34**		**105.58**		**101.7**	
	Engine room&aux. consumers(Supplied from AC220V MSB)																													
12	Lighting																													
12.1	No.1 lighting distribution board	16.6	1	16.6	0.6	9.96	0.5	8.3	0.6	9.96	0.6	9.96	0.7	11.62			0.7	11.62			0.7	11.62			0.7	11.62				
12.2	No.2 lighting distribution board	8.6	1	8.6	0.6	5.16	0.5	4.3	0.6	5.16	0.6	5.16			0.7	6.02			0.7	6.02			0.7	6.02			0.7	6.02		
12.3	No.3 lighting distribution board	9	1	9	0.6	5.4	0.5	4.5	0.6	5.4	0.6	5.4	0.7	6.3			0.7	6.3			0.7	6.3			0.7	6.3				
12.4	No.4 lighting distribution board	6.5	1	6.5	0.6	3.9	0.5	3.25	0.6	3.9	0.6	3.9			0.7	4.55			0.7	4.55			0.7	4.55			0.7	4.55		
12.5	No.5 lighting distribution board	8.85	1	8.85	0.6	5.31	0.5	4.425	0.6	5.31	0.6	5.31	0.7	6.195			0.7	6.195			0.7	6.195			0.7	6.195				
12.6	No.6 lighting distribution board	5.6	1	5.6	0.6	3.36	0.5	2.8	0.6	3.36	0.6	3.36			0.7	3.92			0.7	3.92			0.7	3.92			0.7	3.92		
12.7	No.7 lighting distribution board	9.8	1	9.8	0.6	5.88	0.5	4.9	0.6	5.88	0.6	5.88	0.7	6.86			0.7	6.86			0.7	6.86			0.7	6.86				
12.8	No.8 lighting distribution board	6	1	6	0.6	3.6	0.5	3	0.6	3.6	0.6	3.6			0.7	4.2			0.7	4.2			0.7	4.2			0.7	4.2		
12.9	No.9 lighting distribution board	8.5	1	8.5	0.6	5.1	0.5	4.25	0.6	5.1	0.6	5.1	0.7	5.95			0.7	5.95			0.7	5.95			0.7	5.95				
12.1	No.10 lighting distribution board	3.5	1	3.5	0.6	2.1	0.5	1.75	0.6	2.1	0.6	2.1			0.7	2.45			0.7	2.45			0.7	2.45			0.7	2.45		
12.11	No.11 lighting distribution board	7.1	1	7.1	0.6	4.26	0.5	3.55	0.6	4.26	0.6	4.26	0.7	4.97			0.7	4.97			0.7	4.97			0.7	4.97				
12.12	No.12 lighting distribution board	6.1	1	6.1	0.6	3.66	0.5	3.05	0.6	3.66	0.6	3.66			0.7	4.27			0.7	4.27			0.7	4.27			0.7	4.27		
12.13	No.13 lighting distribution board	8.3	1	8.3	0.6	4.98	0.5	4.15	0.6	4.98	0.6	4.98	0.7	5.81			0.7	5.81			0.7	5.81			0.7	5.81				
12.14	No.14 lighting distribution board	3.4	1	3.4	0.6	2.04	0.5	1.7	0.6	2.04	0.6	2.04			0.7	2.38			0.7	2.38			0.7	2.38			0.7	2.38		
12.15	No.15 lighting distribution board	9	1	9	0.6	5.4	0.5	4.5	0.6	5.4	0.6	5.4	0.7	6.3			0.7	6.3			0.7	6.3			0.7	6.3				
12.16	No.16 lighting distribution board	9	1	9	0.6	5.4	0.5	4.5	0.6	5.4	0.6	5.4			0.7	6.3			0.7	6.3			0.7	6.3			0.7	6.3		
12.17	No.17 lighting distribution board	8.5	1	8.5	0.6	5.1	0.5	4.25	0.6	5.1	0.6	5.1	0.7	5.95			0.7	5.95			0.7	5.95			0.7	5.95				
12.18	No.1 em'cy lighting distribution board	7.3	1	7.3	0.6	4.38	0.5	3.65	0.6	4.38	0.6	4.38			0.7	5.11			0.7	5.11			0.7	5.11	0.7	5.11	0.7	5.11	1	7.3
12.19	No.2 em'cy lighting distribution board	5.8	1	5.8	0.6	3.48	0.5	2.9	0.6	3.48	0.6	3.48			0.7	4.06			0.7	4.06			0.7	4.06	0.7	4.06	0.7	4.06	1	5.8
12.2	No.3 em'cy lighting distribution board	6	1	6	0.6	3.6	0.5	3	0.6	3.6	0.6	3.6			0.7	4.2			0.7	4.2			0.7	4.2	0.7	4.2	0.7	4.2	1	6
12.21	No.4 em'cy lighting distribution board	5.4	1	5.4	0.6	3.24	0.5	2.7	0.6	3.24	0.6	3.24			0.7	3.78			0.7	3.78			0.7	3.78	0.7	3.78	0.7	3.78	1	5.4
12.22	No.5 em'cy lighting distribution board	4.6	1	4.6	0.6	2.76	0.5	2.3	0.6	2.76	0.6	2.76			0.7	3.22			0.7	3.22			0.7	3.22	0.7	3.22	0.7	3.22	1	4.6
12.23	No.6 em'cy lighting distribution board	5.4	1	5.4	0.6	3.24	0.5	2.7	0.6	3.24	0.6	3.24			0.7	3.78			0.7	3.78			0.7	3.78	0.7	3.78	0.7	3.78	1	5.4
12.24	Navigation lights	0.32	1	0.32	0.8	0.256	0.2	0.064	0.8	0.256	0.8	0.256	0.8	0.256	0.8	0.256	0.8	0.256	0.8	0.256	0.8	0.256	0.8	0.256	0.8	0.256	0.8	0.256	1	0.32
13	Ventilation Fan																													
13.1	*Other fans(fwd)	2.97		2.15	0.7	1.505	0.4	0.86	0.7	1.505	0.7	1.505	0.8	1.72			0.8	1.72			0.8	1.72								
13.2	*Other fans(aft)	3.9		4.28	0.7	2.996	0.4	1.712	0.7	2.996	0.7	2.996			0.8	3.424			0.8	3.424			0.8	3.424						
14	Miscellaneous																													
14.1	Battery charger for CHP	2	2	4	0.4	1.6	0.3	1.2	0.4	1.6	0.4	1.6	0.4	1.6	0.4	1.6	0.4	1.6	0.4	1.6	0.4	1.6	0.4	1.6	0.4	1.6	0.4	1.6	0.5	2
14.2	Emergency generator starting battery charger	1	1	1																									1	1
14.3	Navi / comm. equipment	8	1	8	0.7	5.6	0.4	3.2	0.7	5.6	0.7	5.6	0.3	2.4	0.5	4	0.3	2.4	0.5	4	0.3	2.4	0.5	4	0.3	2.4	0.5	4	1	8

Group no.	Consumer	Motor KW	QTY	Total KW	Working condition																									
					Crusing		In port		Arrival/departure		Fi-Fi (without DP)		Construction (Bus bar A1+A2) Light DP		Construction (Bus bar B1+B2) Light DP		Construction (Bus bar A1+A2) Moderate DP		Construction (Bus bar B1+B2) Moderate DP		Construction (Bus bar A1+A2) Heavy DP		Construction (Bus bar B1+B2) Heavy DP		Construction with one engine room lost (Bus bar A1+A2)		Construction with one engine room lost (Bus bar B1+B2)		E-gen	
					Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW	Dem'd factor	KW
14.4	*Socket for reefer container	11	4	44	0.7	30.8			0.7	30.8			0.4	17.6	0.4	17.6	0.4	17.6	0.4	17.6	0.4	17.6	0.4	17.6						
14.5	DP UPS	2.4	4	9.6									0.6	5.76	0.2	1.92	0.6	5.76	0.2	1.92	0.6	5.76	0.2	1.92	0.6	5.76	0.2	1.92		
14.6	Window heater	10	2	20	0.6	12			0.6	12	0.6	12	0.3	6	0.3	6	0.3	6	0.3	6	0.3	6	0.3	6	0.3	6	0.3	6		
14.7	Wiper and cvs			2	0.8	1.6			0.8	1.6	0.8	1.6	0.4	0.8	0.4	0.8	0.4	0.8	0.4	0.8	0.4	0.8	0.4	0.8	0.4	0.8	0.4	0.8		
14.8																														
	Total AC220V CONTINUOUS LOAD for each condition				**157.667**		**91.461**		**157.667**		**126.867**		**96.091**		**93.84**		**96.091**		**93.84**		**96.091**		**93.84**		**100.921**		**72.816**		**45.82**	
INTERMITTENT LOAD																														
15.1	*Galley equipment power distribution board(AC220V)(port)	21.4		17.3	0.3	5.19	0.4	6.92	0.4	6.92	0.4	6.92	0.4	6.92			0.4	6.92			0.4	6.92								
15.2	*Mess room equipment power distribution board(AC220V)(stbd)	47.76		28.7	0.3	8.61	0.4	11.48	0.4	11.48	0.4	11.48			0.4	11.48			0.4	11.48			0.4	11.48						
	Total AC220V INTERMITTENT LOAD for each condition				**13.8**		**18.4**		**18.4**		**18.4**		**6.92**		**11.48**		**6.92**		**11.48**		**6.92**		**11.48**		**0**		**0**		**0**	
					Working condition																									
					Cruising		**In port**		**Arrival/departure**		**Fi-Fi (without DP)**		**Construction (Bus bar A1+A2) Light DP**		**Construction (Bus bar B1+B2) Light DP**		**Construction (Bus bar A1+A2) Moderate DP**		**Construction (Bus bar B1+B2) Moderate DP**		**Construction (Bus bar A1+A2) Heavy DP**		**Construction (Bus bar B1+B2) Heavy DP**		**Construction with one engine room lost (Bus bar A1+A2)**		**Construction with one engine room lost (Bus bar B1+B2)**		**E-gen**	
					CONT	**INT**	**CONT**	**INT**	**CONT**	**INT**	**CONT**	**INT**	**CONT**	**INT**	**CONT**	**INT**	**CONT**	**INT**	**CONT**	**INT**	**CONT**	**INT**	**CONT**	**INT**	**CONT**	**INT**	**CONT**	**INT**	**CONT**	**INT**
	Total AC690V LOAD				**4522.56**		**0**		**5277.68**		**4369.68**		**4349.33**		**4496.53**		**4456.13**		**4736.13**		**4735.38**		**4455.38**		**4922.9**		**4922.9**		**0**	
	TotalAC440V LOAD				**903.856**	**433.77**	**462.627**	**288.2**	**913.252**	**438.75**	**893.718**	**513.99**	**493.312**	**353.53**	**434.903**	**177.7**	**491.332**	**350.23**	**437.723**	**174.4**	**482.992**	**352.21**	**429.383**	**176.38**	**101.16**	**117.34**	**105.32**	**105.58**	**93.2**	**101.7**
	TotalAC220V LOAD				**157.667**	**13.8**	**91.461**	**18.4**	**157.667**	**18.4**	**126.867**	**18.4**	**96.091**	**6.92**	**93.84**	**11.48**	**96.091**	**6.92**	**93.84**	**11.48**	**96.091**	**6.92**	**93.84**	**11.48**	**100.92**	**0**	**72.816**	**0**	**45.82**	**0**
	Diversity factor					**0.4**		**0.4**		**0.4**		**0.4**		**0.4**		**0.4**		**0.4**		**0.4**		**0.4**		**0.4**		**0.4**		**0.4**		**1**
	Required KW for INTERMITTENT LOAD					**179.03**		**122.7**		**182.86**		**212.956**		**144.18**		**75.672**		**142.86**		**74.352**		**143.652**		**75.144**		**46.936**		**42.232**		**101.7**
	Total KW (continuous + intermittent)				**5763.11**		**676.74**		**6531.46**		**5603.22**		**5082.91**		**5100.95**		**5186.41**		**5342.05**		**5458.11**		**5053.75**		**5171.92**		**5143.27**		**240.72**	
	Quantity & power of generators in use kw				**2x3170**		**1x740**		**2x2495+3170**		**2x3170**		**1x3170+1x2495**		**1x3170+1x2495**		**1x3170+1x2495**		**1x3170+1x2495**		**1x3170+1x2495**		**1x3170+1x2495**		**1x3170+1x2495**		**1x3170+1x2495**		**1x260**	
	Load factor of generator/%				**90.90**		**91.45**		**80.04**		**88.38**		**89.72**		**90.04**		**91.55**		**94.30**		**96.35**		**89.21**		**91.30**		**90.79**		**92.58**	
	Quantity&power of generators in standby kw				**2x2495**		**1x740**		**1x3170**		**2x2495**																			
	Load for AC690V/440V LLC Transformer KVA				**1550.69**		**845.93**		**1567.22**		**1541.93**		**916.98**		**755.52**		**912.85**		**757.39**		**903.42**		**747.96**		**311.27**		**275.46**			
	Quantity&power of AC690V/440V LLC Transformer in use KVA				**1x1600**		**1x1600**		**1x1600**		**1x1600**		**1x1600**		**1x1600**		**1x1600**		**1x1600**		**1x1600**		**1x1600**		**1x1600**		**1x1600**			
	Load factor of LLC Transformer/%				**96.92**		**52.87**		**97.95**		**96.37**		**57.31**		**47.22**		**57.05**		**47.34**		**56.46**		**46.75**		**19.45**		**17.22**			
	Load for AC440V/220V Transformer KVA				**203.98**		**123.53**		**206.28**		**167.78**		**123.57**		**123.04**		**123.57**		**123.04**		**123.57**		**123.04**		**126.15**		**91.02**		**57.28**	
	Quantity&power of AC440V/220V Transformer in use KVA				**1x300**		**1x300**		**1x300**		**1x300**		**1x300**		**1x300**		**1x300**		**1x300**		**1x300**		**1x300**		**1x300**		**1x300**		**1x60**	
	Load factor of AC440V/220V Transformer/%				**67.99**		**41.18**		**68.76**		**55.93**		**41.19**		**41.01**		**41.19**		**41.01**		**41.19**		**41.01**		**42.05**		**30.34**		**95.46**	

Note: 1. Standby gensets（2x2495）drive the external Fi-Fi pumps, and will be connect to main switchboard as standby ones during external FIFI condition.

2. Engine room supply fan(reversible) is supplied from ESB, if the emergency generator is overload, it will be preferential tripped, hence it is not included in emergency generaotr capacity calculation.

3. The equipments marked with * are to be preferential tripped during DP operation after one engine room lost.

4. The light DP work condition is during telescopic access bridge operating.

5. The moderate DP work condition is during aux crane operating.

6. The heavy DP work condition is during main crane operating.

7. The power factor of electrical equipments could be regarded as 0.8 except for thrusters(azimuth thruster&tunnel thruster&retractable thruster).