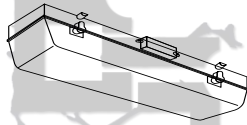
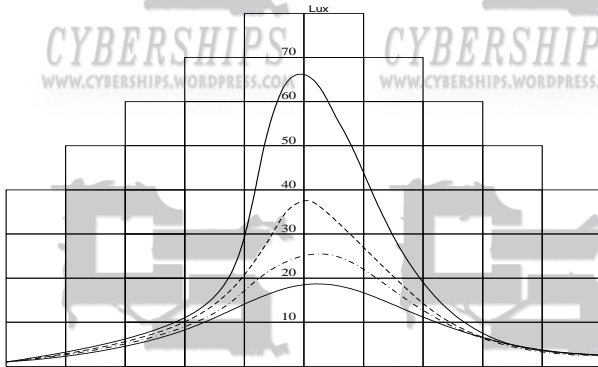
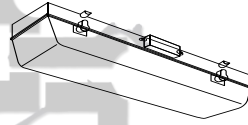


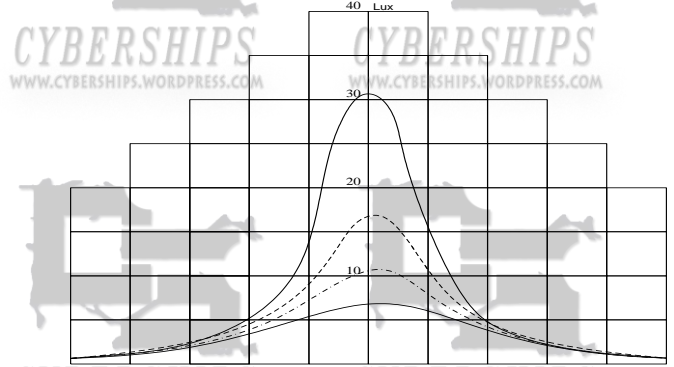
Indeks :  
4

Model	Jenis Armatur	d
	FL 15 w x 1	0.7



Indeks :  
4B

Model	Jenis Armatur	d
	FL 20 w x 2	0.7



Faktor (k)	Indeks 4										Faktor (k)	Indeks 4B											
	Ceiling	75			50			30				0	Ceiling	75			50			30			0
	Wall	50	30	10	50	30	10	30	10	0		Wall	50	30	10	50	30	10	30	10	0		
	Floor	10			10			10			0	Floor	10			10			10			0	
$\eta$	Faktor Refleksi										$\eta$	Faktor Refleksi											
0.60	(J)	0.295	0.246	0.213	0.283	0.250	0.211	0.233	0.207	0.206	0.60	(J)	0.285	0.233	0.213	0.268	0.235	0.213	0.230	0.209	0.239		
0.80	(I)	0.368	0.314	0.283	0.350	0.301	0.272	0.296	0.267	0.252	0.80	(I)	0.322	0.294	0.278	0.315	0.287	0.231	0.256	0.268	0.265		
1.00	(H)	0.406	0.357	0.327	0.390	0.345	0.317	0.336	0.308	0.294	1.00	(H)	0.345	0.318	0.313	0.343	0.321	0.305	0.318	0.302	0.282		
1.25	(G)	0.452	0.408	0.368	0.421	0.378	0.346	0.367	0.336	0.378	1.25	(G)	0.382	0.353	0.340	0.369	0.347	0.331	0.361	0.329	0.309		
1.50	(F)	0.487	0.439	0.393	0.452	0.413	0.374	0.399	0.366	0.355	1.50	(F)	0.405	0.381	0.355	0.385	0.366	0.349	0.394	0.367	0.329		
2.00	(E)	0.538	0.488	0.461	0.503	0.460	0.421	0.438	0.304	0.400	2.00	(E)	0.433	0.412	0.590	0.419	0.402	0.379	0.412	0.376	0.356		
2.50	(D)	0.588	0.523	0.475	0.507	0.496	0.456	0.475	0.465	0.431	2.50	(D)	0.465	0.435	0.415	0.469	0.434	0.408	0.417	0.405	0.585		
3.00	(C)	0.608	0.556	0.493	0.566	0.521	0.418	0.499	0.468	0.461	3.00	(C)	0.481	0.454	0.414	0.461	0.433	0.421	0.431	0.415	0.395		
4.00	(B)	0.650	0.596	0.554	0.603	0.553	0.525	0.552	0.509	0.499	4.00	(B)	0.499	0.472	0.457	0.478	0.455	0.444	0.454	0.437	0.457		
5.00	(A)	0.672	0.624	0.581	0.623	0.578	0.546	0.549	0.582	0.527	5.00	(A)	0.511	0.486	0.469	0.491	0.464	0.459	0.457	0.406	0.436		



## BEBAN PENERANGAN

NO	Ruang	Dimensi (m)			h (m)	A (m <sup>2</sup> )	Armatur			K	Fakt Refleksi			Iterasi Tabel				η	d	E (lux)	Qar lum	Armatur		Stp Kntk (W)			Tot Daya W															
		p	l	t			Idx	Jenis	Daya		rf	rw	rc	k1	k2	h1	h2					n	N	300	600	1200																
<b>1. Double Bottom</b>																																										
1	CONTROL ROOM	6.70	5.30	3.30	2.60	35.51	18	2 x 20	40	1.14	0.1	0.5	0.75	1.00	1.25	0.47	0.521	0.50	0.70	150	3000	5.09	5	3			1100															
2	PLATFORM	18.76	7.85	3.30	3.30	147.27	14	2 x 20	40	1.68	0.1	0.5	0.75	1.50	2.00	0.671	0.729	0.69	0.75	200	3000	18.93	19	4			1960															
3	ENGINE STORE	18.76	13.12	3.50	3.50	246.13	14	4 x 20	80	2.21	0.1	0.3	0.50	2.00	2.50	0.657	0.707	0.68	0.75	200	6000	16.14	16	4			2480															
4	STEERING GEAR ROOM	7.21	3.50	3.30	3.00	25.24	14	2 x 20	40	0.79	0.1	0.3	0.50	0.60	0.80	0.361	0.647	0.63	0.75	150	3000	2.69	3	3			1020															
5	WORKSHOP	4.00	4.00	3.30	2.30	16.00	14	2 x 20	40	0.87	0.1	0.3	0.50	0.80	1.00	0.647	0.547	0.61	0.75	200	3000	2.32	2		4		2480															
6	PUMP ROOM	7.53	2.68	6.80	6.80	20.18	14	2 x 20	40	0.29	0.1	0.3	0.50					0.36	0.75	150	3000	3.73	4				160															
Jumlah																																									49	9200
<b>2. MAIN DECK</b>																																										
1	PAINT & TOOLS STORE	6.56	5.03	2.60	2.00	33.00	13	2 x 20	40	1.42	0.1	0.5	0.75	1.25	1.50	0.489	0.526	0.51	0.75	70	3000	1.99	2				80															
2	ROPE & DECK STORE (OUT)	6.56	5.03	2.60	2.00	33.00	13	2 x 20	40	1.42	0.1	0.5	0.75	1.25	1.50	0.489	0.526	0.51	0.75	70	3000	1.99	2				80															
3	FOAM ROOM	5.69	2.68	2.60	2.00	15.25	13	2 x 15	30	0.91	0.1	0.5	0.75	0.80	1.00	0.407	0.445	0.43	0.75	100	2250	2.11	2				60															
4	FIRE EQUIPMENT STORE	5.69	2.68	2.60	2.00	15.25	13	2 x 15	30	0.91	0.1	0.5	0.75	0.80	1.00	0.407	0.445	0.43	0.75	100	2250	2.11	2				60															
5	SEAMAN ROOM	5.58	3.94	2.60	2.00	21.99	18	2 x 20	40	1.15	0.1	0.5	0.75	1.00	1.25	0.470	0.521	0.50	0.70	100	3000	2.09	2	2			680															
6	CREW LIVING ROOM	5.55	4.69	2.60	2.00	26.03	18	2 x 15	30	1.27	0.1	0.5	0.75	1.25	1.50	0.521	0.556	0.52	0.70	150	2250	4.73	5	3			1050															
7	GALLEY	5.40	3.43	2.60	2.00	18.52	18	2 x 15	30	1.05	0.1	0.5	0.75	1.00	1.25	0.470	0.521	0.48	0.70	200	2250	4.90	5		2		2550															
8	BATHROOM	4.69	2.70	2.60	2.00	12.66	4	1 x 10	10	0.86	0.1	0.5	0.75	0.80	1.00	0.368	0.406	0.38	0.70	50	750	3.18	3				30															
9	BOYS CREW ROOM	5.39	4.02	2.60	2.00	21.67	18	2 x 20	40	1.15	0.1	0.5	0.75	1.00	1.25	0.470	0.521	0.50	0.70	100	3000	2.06	2	2			680															
10	CREW MESS ROOM	5.18	4.69	2.60	2.00	24.29	18	2 x 20	40	1.23	0.1	0.5	0.75	1.00	1.25	0.470	0.521	0.52	0.70	150	3000	3.36	3	3			1020															
11	ASS.COOK & STEWARD RM	5.15	4.69	2.60	2.00	24.15	18	2 x 20	40	1.23	0.1	0.5	0.75	1.00	1.25	0.470	0.521	0.52	0.70	100	3000	2.23	2	2			680															
12	DRY STORE	4.72	2.01	2.60	2.00	9.49	4	1 x 15	15	0.70	0.1	0.5	0.75	0.60	0.80	0.295	0.368	0.33	0.70	50	1125	1.81	2				30															
13	SMOOKING ROOM	4.55	3.35	2.60	2.00	15.24	18	2 x 15	30	0.96	0.1	0.5	0.75	0.80	1.00	0.439	0.470	0.46	0.70	100	2250	2.08	2				60															
14	HOSPITAL	4.47	2.68	2.60	1.80	11.98	18	2 x 15	30	0.93	0.1	0.5	0.75	0.80	1.00	0.439	0.470	0.46	0.70	200	2250	3.31	3	2			690															
15	ROPE & DECK STORE (IN)	4.13	2.61	2.60	2.00	10.78	13	1 x 15	15	0.80	0.1	0.5	0.75					0.41	0.75	70	1125	2.20	2				30															
16	LAUNDRY	5.15	2.70	2.60	1.80	13.91	4	1 x 15	15	0.98	0.1	0.5	0.75	0.80	1.00	0.368	0.406	0.40	0.70	50	1125	2.19	2	3			930															
17	LAUNDRY DRY STORE	4.13	2.81	2.60	1.80	11.61	4	1 x 15	15	0.93	0.1	0.5	0.75	0.80	1.00	0.368	0.406	0.39	0.70	50	1125	1.88	2				30															
18	ELECTRIC & CREW STORE	3.68	3.00	2.60	2.00	11.04	4	1 x 15	15	0.83	0.1	0.5	0.75	0.80	1.00	0.368	0.406	0.37	0.70	50	1125	1.88	2	1			330															
19	SPAREPART STORE	3.64	2.80	2.60	2.00	10.19	4	1 x 15	15	0.79	0.1	0.5	0.75	0.60	0.80	0.295	0.368	0.36	0.70	50	1125	1.77	2				30															
20	AC ROOM	3.45	3.14	2.60	2.60	10.83	18	2 x 20	40	0.63	0.1	0.5	0.75	0.60	0.80	0.359	0.439	0.37	0.70	150	3000	2.08	2				80															
21	CO <sub>2</sub> ROOM	3.45	3.14	2.60	2.60	10.83	18	2 x 20	40	0.63	0.1	0.5	0.75	0.60	0.80	0.359	0.439	0.37	0.70	150	3000	2.08	2				80															
22	LADDER FRONT	2.70	1.00	2.60	2.60	2.70	4	1 x 10	10	0.28	0.1	0.5	0.75					0.30	0.70	70	750	1.20	1				10															
23	LADDER MIDDLE	2.70	1.00	2.60	2.60	2.70	4	1 x 10	10	0.28	0.1	0.5	0.75					0.30	0.70	70	750	1.20	1				10															
24	LADDER BACK	2.70	1.00	2.60	2.60	2.70	4	1 x 10	10	0.28	0.1	0.5	0.75					0.30	0.70	70	750	1.20	1				10															
25	GANGWAY (SB)	27.51	1.20	2.60	2.60	33.01	4	2 x 10	20	0.44	0.1	0.5	0.75					0.30	0.70	60	1500	6.39	6				120															
26	GANGWAY (PS)	27.51	1.20	2.60	2.60	33.01	4	2 x 10	20	0.44	0.1	0.5	0.75					0.30	0.70	60	1500	6.39	6				120															
Jumlah																																									66	9530

NO	Ruang	Dimensi (m)			h (m)	A (m <sup>2</sup> )	Armatur			K	Fakt Refleksi			Iterasi Tabel				η	d	E (lux)	Qar lum	Armatur					Tot Daya W				
		p	l	t			Idx	Jenis	Daya		rf	rw	rc	k1	k2	h1	h2					n	N								
<b>3. POOP DECK</b>																															
1	OFFICER MESS ROOM	6.05	6.03	2.60	2.00	36.48	18	3	x	20	60	1.51	0.1	0.5	0.75	1.5	2	0.556	0.600	0.56	0.70	150	4500	3.12	3	4			1380		
2	BATHROOM (FRONT)	5.17	2.70	2.60	2.00	13.96	4	1	x	15	15	0.89	0.1	0.5	0.75	0.8	1	0.368	0.406	0.38	0.70	50	1125	2.31	2				30		
3	OFFICER LIVING ROOM	6.05	6.03	2.60	2.00	36.48	18	3	x	20	60	1.51	0.1	0.5	0.75	1.5	2	0.556	0.600	0.56	0.70	150	4500	3.12	3	3			1080		
4	THIRD OFFICER ROOM	4.57	3.23	2.60	2.00	14.76	18	2	x	15	30	0.95	0.1	0.5	0.75	0.8	1	0.439	0.470	0.46	0.70	100	2250	2.03	2	1			360		
5	THIRD ENGINEER ROOM	4.57	3.23	2.60	2.00	14.76	18	2	x	15	30	0.95	0.1	0.5	0.75	0.8	1	0.439	0.470	0.46	0.70	100	2250	2.03	2	1			360		
6	BATHROOM (PS)	2.40	2.01	2.60	2.00	4.82	4	1	x	15	15	0.55	0.1	0.5	0.75					0.30	0.70	50	1125	1.04	1				15		
7	BATHROOM (SB)	2.40	2.01	2.60	2.00	4.82	4	1	x	15	15	0.55	0.1	0.5	0.75					0.30	0.70	50	1125	1.04	1				15		
8	GUEST ROOM	4.48	2.89	2.60	2.00	12.95	18	2	x	20	40	0.88	0.1	0.5	0.75	0.8	1	0.439	0.470	0.45	0.70	100	3000	1.37	1	1			340		
9	CHIEF COOK ROOM	4.48	2.89	2.60	2.00	12.95	18	2	x	20	40	0.88	0.1	0.5	0.75	0.8	1	0.439	0.470	0.45	0.70	100	3000	1.37	1	1			340		
10	BOATSWAIN ROOM	5.02	1.75	2.60	2.00	8.79	18	2	x	20	40	0.65	0.1	0.5	0.75	0.6	0.8	0.359	0.439	0.38	0.70	100	3000	1.11	1	1			340		
11	SAFETY EQUIPMENT STORE	5.02	1.75	2.60	2.00	8.79	18	2	x	20	40	0.65	0.1	0.5	0.75	0.6	0.8	0.359	0.439	0.38	0.70	100	3000	1.11	1				40		
12	MOSQUE	5.15	4.60	2.60	2.00	23.69	18	2	x	20	40	1.21	0.1	0.5	0.75	1	1.25	0.470	0.521	0.51	0.70	100	3000	2.20	2				80		
13	LADDER FRONT	2.70	1.00	2.60	2.60	2.70	4	1	x	10	10	0.28	0.1	0.5	0.75					0.30	0.70	70	750	1.20	1				10		
14	LADDER BACK	2.70	1.00	2.60	2.60	2.70	4	1	x	10	10	0.28	0.1	0.5	0.75					0.30	0.70	70	750	1.20	1				10		
15	GANGWAY (SB)	21.34	1.20	2.60	2.60	25.61	4	2	x	10	20	0.44	0.1	0.5	0.75					0.30	0.70	60	1500	4.88	5				100		
16	GANGWAY (PS)	21.34	1.20	2.60	2.60	25.61	4	2	x	10	20	0.44	0.1	0.5	0.75					0.30	0.70	60	1500	4.88	5				100		
Jumlah																										<b>32</b>					<b>4600</b>
<b>4. BOAT DECK</b>																															
1	CAPTAIN ROOM	5.50	2.97	2.60	2.00	16.34	18	2	x	15	30	0.96	0.1	0.5	0.75	0.8	1	0.439	0.470	0.46	0.70	100	2250	2.23	2	1			360		
2	BATHROOM	2.20	1.40	2.60	2.00	3.08	4	1	x	10	10	0.43	0.1	0.5	0.75					0.30	0.70	50	750	0.99	1				10		
3	OFFICE	6.50	5.37	2.60	2.00	34.91	18	3	x	15	45	1.47	0.1	0.5	0.75	1.25	1.5	0.521	0.556	0.55	0.70	150	3375	4.02	4	4			1380		
4	CHIEF ENGINEER ROOM	5.50	2.97	2.60	2.00	16.34	18	2	x	15	30	0.96	0.1	0.5	0.75	0.8	1	0.439	0.470	0.46	0.70	100	2250	2.23	2	1			360		
5	BATHROOM	2.20	1.40	2.60	2.00	3.08	4	1	x	10	10	0.43	0.1	0.5	0.75					0.30	0.70	50	750	0.99	1				10		
6	CHIEF OFFICER ROOM	4.36	3.61	2.60	2.00	15.74	18	2	x	15	30	0.99	0.1	0.5	0.75	0.8	1	0.439	0.470	0.47	0.70	100	2250	2.14	2	1			360		
7	SECOND OFFICER ROOM	4.36	3.43	2.60	2.00	14.95	18	2	x	15	30	0.96	0.1	0.5	0.75	0.8	1	0.439	0.470	0.46	0.70	100	2250	2.05	2	1			360		
8	BATHROOM	2.40	2.01	2.60	2.00	4.82	4	1	x	15	15	0.55	0.1	0.5	0.75					0.30	0.70	50	1125	1.04	1				15		
9	QUARTER MASTER ROOM	4.36	3.61	2.60	2.00	15.74	18	2	x	15	30	0.99	0.1	0.5	0.75	0.8	1	0.439	0.470	0.47	0.70	100	2250	2.14	2	1			360		
10	SECOND ENGINEER ROOM	4.36	3.43	2.60	2.00	14.95	18	2	x	15	30	0.96	0.1	0.5	0.75	0.8	1	0.439	0.470	0.46	0.70	100	2250	2.05	2	1			360		
11	BATHROOM	2.40	2.01	2.60	2.00	4.82	4	1	x	15	15	0.55	0.1	0.5	0.75					0.30	0.70	50	1125	1.04	1				15		
14	LADDER	2.70	1.00	2.60	2.60	2.70	4	1	x	10	10	0.28	0.1	0.5	0.75					0.30	0.70	70	750	1.20	1				10		
15	GANGWAY (SB)	13.65	1.20	2.60	2.60	16.38	4	2	x	10	20	0.42	0.1	0.5	0.75					0.30	0.70	60	1500	3.12	3				60		
16	GANGWAY (PS)	13.65	1.20	2.60	2.60	16.38	4	2	x	10	20	0.42	0.1	0.5	0.75					0.30	0.70	60	1500	3.12	3				60		
Jumlah																										<b>27</b>					<b>3720</b>
<b>5. NAVIGATION DECK</b>																															
1	WHEEL HOUSE	15.89	6.37	2.60	2.00	101.22	18	4	x	20	80	2.27	0.1	0.5	0.75	2	2.5	0.600	0.645	0.62	0.70	150	6000	5.79	6	4			1680		
2	ESEP	2.46	2.00	2.60	2.00	4.92	18	1	x	20	20	0.55	0.1	0.5	0.75					0.36	0.70	100	1500	1.31	1	1			320		
3	W.C	1.25	1.00	2.60	2.00	1.25	4	1	x	10	10	0.28	0.1	0.5	0.75					0.30	0.70	50	750	0.40	1				10		
4	CHART ROOM	2.70	2.35	2.60	2.00	6.35	18	2	x	20	40	0.63	0.1	0.5	0.75	0.6	0.8	0.359	0.439	0.37	0.70	150	3000	1.22	1	1			340		
5	RADIO ROOM	2.46	2.35	2.60	2.00	5.78	18	2	x	15	30	0.60	0.1	0.5	0.75					0.36	0.70	100	2250	1.02	1	2			630		
6	RADIO OFFICER ROOM	2.46	2.35	2.60	2.00	5.78	18	2	x	15	30	0.60	0.1	0.5	0.75					0.36	0.70	100	2250	1.02	1	1			330		
7	LADDER	2.70	1.00	2.60	2.60	2.70	4	1	x	10	10	0.28	0.1	0.5	0.75					0.30	0.70	70	750	1.20	1				10		
Jumlah																										<b>12</b>					<b>3320</b>
																										TOTAL DAYA PENERANGAN DAN STOP KONTAK =				<b>30.37</b>	



Peralatan	Set	Beban dilaut (berlayar)				Berangkat				Bongkar muat				Sandar					
		Daya		Work Set	LF	Daya (kw)		Work Set	LF	Daya (kw)		Work Set	LF	Daya (kw)		Work Set	LF	Daya (kw)	
		KW	Set			C.L.	I.L.			C.L.	I.L.			C.L.	I.L.			C.L.	I.L.
<b>HULL PART</b>																			
<b>1 Refrigerating and Ventilation</b>																			
- Accomodation Supply Fan																			
- Main Deck	1	1.22	1	0.85	1.04	-	1	0.85	1.04	-	1	0.85	1.04	-	1	0.85	1.04	-	-
- Poop Deck	1	2.52	1	0.85	2.14	-	1	0.85	2.14	-	1	0.85	2.14	-	1	0.85	2.14	-	-
- Boat Deck	1	1.53	1	0.85	1.30	-	1	0.85	1.30	-	1	0.85	1.30	-	1	0.85	1.30	-	-
- Navigation Deck	1	2.50	1	0.85	2.13	-	1	0.85	2.13	-	1	0.85	2.13	-	1	0.85	2.13	-	-
- Forecastle Deck	1	0.50	1	0.85	0.43	-	1	0.85	0.43	-	1	0.85	0.43	-	1	0.85	0.43	-	-
- Accomodation Exhaust Fan																			
- Main Deck	1	0.68	1	0.85	0.58	-	1	0.85	0.58	-	1	0.85	0.58	-	1	0.85	0.58	-	-
- Poop Deck	1	0.55	1	0.85	0.47	-	1	0.85	0.47	-	1	0.85	0.47	-	1	0.85	0.47	-	-
- Boat Deck	1	0.46	1	0.85	0.39	-	1	0.85	0.39	-	1	0.85	0.39	-	1	0.85	0.39	-	-
- Navigation Deck	1	0.68	1	0.85	0.58	-	1	0.85	0.58	-	1	0.85	0.58	-	1	0.85	0.58	-	-
- Forecastle Deck	1	0.15	1	0.85	0.13	-	1	0.85	0.13	-	1	0.85	0.13	-	1	0.85	0.13	-	-
- Engine Room Supply Fan	1	0.60	1	0.80	0.48	-	1	0.80	0.48	-	1	0.50	0.30	-	1	0.80	0.48	-	-
- Engine Room Exhaust Fan	1	0.65	1	0.80	0.52	-	1	0.80	0.52	-	1	0.50	0.33	-	1	0.80	0.52	-	-
Inert Gas Fan System	1	2.25	1	0.80	0.80	-	1	0.80	0.80	-	1	0.50	0.50	-	1	0.80	0.80	-	-
- Refrigerated equipment for																			
- Dry Provision Store	1	2.40	1	0.60	1.44	-	1	0.80	-	1.92	1	0.60	1.44	-	1	0.80	1.92	-	-
<b>2 Deck Machinery</b>																			
- Steering Gear	1	14.00	1	0.20	2.80	-	1	0.20	2.80	-	-	-	-	-	-	-	-	-	-
- Capstan	1	10.40		-	-	-	1	0.40	-	4.16		-	-	-	-	-	-	-	-
- Windlass	1	44.08		-	-	-		-	-	-		-	-	-	1	0.20	-	8.82	-
- Mooring Winch	2	2.40		-	-	-		-	-	-		-	-	-	-	-	-	-	-
- Electric motor for Crane sc	2	6.70		-	-	-		-	-	-	2	0.80	-	10.72		-	-	-	-
- Davits Winch	2	8.01		-	-	-		-	-	-		-	-	-	-	-	-	-	-
- Accomodation Ladder Winch	2	8.01		-	-	-		-	-	-	2	0.80	-	12.82		-	-	-	-
Jumlah		<i>Continue load</i>			15.21				13.77				11.74				12.89		
		<i>Intermitten load</i>								6.08				23.54					8.82

Peralatan	Set	Daya KW	Beban dilaut (berlayar)				Berangkat				Bongkar muat				Sandar							
			Work	Set	LF	Daya (kw)		Work	Set	LF	Daya (kw)		Work	Set	LF	Daya (kw)		Work	Set	LF	Daya (kw)	
						C.L.	I.L.				C.L.	I.L.				C.L.	I.L.				C.L.	I.L.
<b>ELECTRICAL PART</b>																						
<b>1 Lighting &amp; Stop kontak</b>																						
- Main Deck	1	9.53	1	0.80	7.62	-	1	0.80	7.62	-	1	0.70	6.67	-	1	0.70	6.67	-	-	-		
- Poop Deck	1	4.60	1	0.80	3.68	-	1	0.80	3.68	-	1	0.70	3.22	-	1	0.70	3.22	-	-	-		
- Boat Deck	1	3.72	1	0.80	2.98	-	1	0.80	2.98	-	1	0.70	2.60	-	1	0.70	2.60	-	-	-		
- Navigation deck	1	3.32	1	0.80	2.66	-	1	0.80	2.66	-	1	0.70	2.32	-	1	0.70	2.32	-	-	-		
- Double Bottom	1	9.20	1	1.00	9.20	-	1	1.00	9.20	-	1	1.00	9.20	-	1	1.00	9.20	-	-	-		
- Anchor Light	1	0.20		-	-	-		-	-	-		-	-	-	1	1.00	0.20	-	-	-		
- Mast Head Light	1	0.40		-	-	-		-	-	-		-	-	-	1	1.00	0.40	-	-	-		
- Red Light	1	0.30		-	-	-		-	-	-	2	1.00	0.60	-	2	1.00	0.60	-	-	-		
- Morse Light	2	0.80	2	1.00	1.60	-	1	1.00	0.80	-		-	-	-		-	-	-	-	-		
- Side Light	2	1.20		-	-	-		-	-	-	4	1.00	4.80	-	4	1.00	4.80	-	-	-		
- Stern Light	1	0.20	1	1.00	0.20	-	1	1.00	0.20	-		-	-	-		-	-	-	-	-		
- Mooring Light	1	0.20	1	1.00	0.20	-	1	1.00	0.20	-		-	-	-	1	1.00	0.20	-	-	-		
- Compass Deck	1	0.20	1	1.00	0.20	-	1	1.00	0.20	-		-	-	-		-	-	-	-	-		
- Funnel Light	1	0.40		-	-	-		-	-	-	1	1.00	0.40	-	1	1.00	0.40	-	-	-		
<b>2 Navigation, Communication and Safety Equip.</b>																						
- Radio equipment	1	1.80	1	0.80	-	1.44	1	0.80	-	1.44		-	-	-		-	-	-	-	-		
- Gyro Compass & Auto Pilot	1	0.35	1	0.80	0.28	-	1	0.80	0.28	-		-	-	-		-	-	-	-	-		
- Echo Sounder	1	0.50	1	0.80	-	0.40	1	0.80	-	0.40	1	0.80	-	0.40		-	-	-	-	-		
- Radar	1	1.60	1	1.00	-	1.60	1	1.00	-	1.60		-	-	-		-	-	-	-	-		
- Alarm Communication	1	0.15	1	1.00	-	0.15	1	1.00	-	0.15	1	1.00	-	0.15	1	1.00	-	0.15	-	0.15		
- Engine Order Telegraph	1	0.30	1	1.00	-	0.30	1	1.00	-	0.30		-	-	-		-	-	-	-	-		
- Fire And Smoke Detector	1	0.25	1	1.00	-	0.25	1	1.00	-	0.25	1	1.00	-	0.25	1	1.00	-	0.25	-	0.25		
- General Alarm	1	0.20	1	1.00	-	0.20	1	1.00	-	0.20	1	1.00	-	0.20	1	1.00	-	0.20	-	0.20		
- Interior Communication	1	1.50	1	0.50	0.75	-	1	0.50	0.75	-	1	0.50	0.75	-	1	0.50	0.75	-	-	-		
- Motor sirine and motor horn	1	0.20	1	0.80	-	0.16	1	0.80	-	0.16		-	-	-	1	0.80	-	-	-	0.16		
Jumlah		<i>Continue load</i>			29.37				28.57				30.57					31.37		-		
		<i>Intermitten load</i>				4.50				4.50				1.00						0.76		

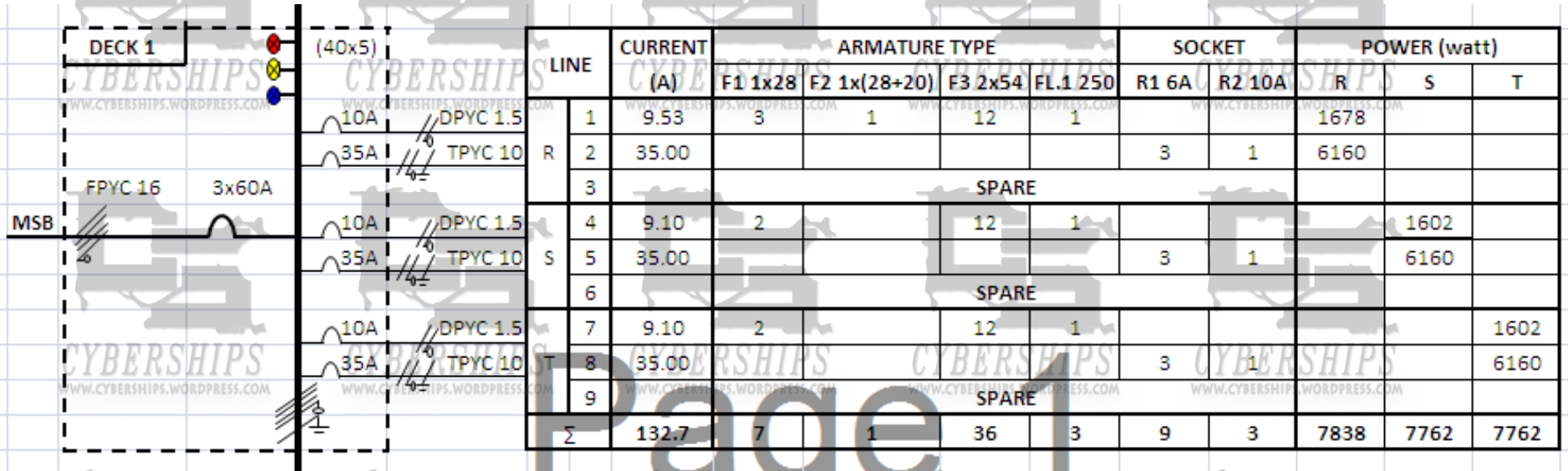
### ESTIMASI BEBAN DAYA GENSET

No.	ITEM	Dilaut (berlayar)	Meninggalkan pelabuhan	Bongkar muat	Berlabuh	
a	MACHINERY PART	Continue load	128.74	97.77	300.44	37.65
		Intermitten load	30.53	21.18	16.08	-
b	HULL PART	Continue load	15.21	13.77	11.74	12.89
		Intermitten load	-	6.08	23.54	8.82
c	ELECTRICAL PART	Continue load	29.37	28.57	30.57	31.37
		Intermitten load	4.50	4.50	1.00	0.76
d	Total Penggunaan daya marine genset	Continue load	173.32	140.11	342.74	81.91
		Intermitten load	35.03	31.76	40.62	9.58
e	F.diversitas	0.7x(d)intermitten	24.52	22.23	28.43	6.70
f	Jumlah beban	(d)continue+( e )	<b>197.8</b>	<b>162.34</b>	<b>371.17</b>	<b>89</b>
g	Gen. bekerja	kW x S.set	1 x 231.00	1 x 231.00	2 x 231.00	1 x 231.0
h	Kapasitas yang tersedia		231.00	231.00	462.00	231.00
i	Faktor beban	<sup>(n)</sup> / <sub>(h)</sub> x 100%	85.64	70.28	80.34	38.36
j	Shore Connection (1.15 x juml. Beban Bongkar Muat)		1.15 x 371.17	=	426.85	

### PEMILIHAN GENSET

No.	Type	Rpm	KVA (kW)	Set	Faktor beban Generator							
					Dilaut (berlayar)	Set	Meninggalkan pelabuhan	Set	Bongkar muat	Set	Berlabuh	Set
1	CATERPILLAR SR4B	1500	350 280	3	$\frac{197.840}{280 \times 1} = 70.7$	1	$\frac{162.341}{280 \times 1} = 58$	1	$\frac{371.174}{280 \times 2} = 66.3$	2	$\frac{88.610}{280 \times 1} = 32$	1
2	BETA MARINE UB 244	1500	305 244	3	$\frac{197.840}{244 \times 1} = 81.1$	1	$\frac{162.341}{244 \times 1} = 67$	1	$\frac{371.174}{244 \times 2} = 76.1$	2	$\frac{88.610}{244 \times 1} = 36$	1
3	VOLVO PENTA D9MG/HCM434E-1	1500	275 220	3	$\frac{197.840}{220 \times 2} = 45.0$	2	$\frac{162.341}{220 \times 1} = 74$	1	$\frac{371.174}{220 \times 2} = 84.4$	2	$\frac{88.610}{220 \times 1} = 40$	1
4	CATERPILLAR 3406C	1500	325 260	3	$\frac{197.840}{260 \times 1} = 76.1$	1	$\frac{162.341}{260 \times 1} = 62$	1	$\frac{371.174}{260 \times 2} = 71.4$	2	$\frac{88.610}{260 \times 1} = 34$	1
5	DEUTZ BF6M 1015	1500	289 231	3	$\frac{197.840}{231 \times 1} = 85.6$	1	$\frac{162.341}{231 \times 1} = 70$	1	$\frac{371.174}{231 \times 2} = 80.3$	2	$\frac{88.610}{231 \times 1} = 38$	1

**ONE LINE DIAGRAM**



**1 $\phi$  WIRE & BREAKER**

$P_{R/S/T} = 1678$  watt  
 $V = 220$  volt  
 $\cos \theta = 0.8$

$I_{1\phi} = \frac{P_{R/S/T}}{V_{\text{phase}} \times \cos \theta}$   
 $= \frac{1678}{220 \times 0.8}$

$I_{1\phi} = 9.53$  A

**JUNCTION WIRE & BREAKER**

$P_{R/S/T} = 7838$  watt  
 $V = 220$  volt  
 $\cos \theta = 0.8$

$I_{1\phi} = \frac{P_{R/S/T}}{V_{\text{phase}} \times \cos \theta}$   
 $= \frac{7838}{220 \times 0.8}$

$I_{1\phi} = 44.53$  A

**BUSBAR (SHORT CIRCUIT)**

$I_{sc} = 4 \times I_{\text{total}}$   
 $= 4 \times 132.7$   
 $I_{sc} = 531.0$  A



NO	NOMINAL CURRENT	STARTING CURRENT	EQUIPMENT	POWER INPUT (kW)	QTY	POWER (kW)			
						CONSUMPTION	R	S	T
1	94.96	284.88	SEA WATER DESALINATION PLANT	50.00	1.00	50.00	16.67	16.67	16.67
2	13.29	39.88	OILY WATER SEPARATOR	7.00	1.00	7.00	2.33	2.33	2.33
3	9.50	28.49	ELECTRIC MOTOR FOR ACC. LIFT	5.00	1.00	5.00	1.67	1.67	1.67
4	5.70	17.09	SEWAGE TREATMENT PLANT	3.00	1.00	3.00	1.00	1.00	1.00
5	5.70	17.09	SEWAGE DISCHARGE PUMP	3.00	1.00	3.00	1.00	1.00	1.00
6	5.70	17.09	SEWAGE DISCHARGE PUMP	3.00	1.00	3.00	1.00	1.00	1.00
7	4.94	14.81	F.W PRESSURE SET PUMP	2.60	1.00	2.60	0.87	0.87	0.87
8	4.94	14.81	F.W PRESSURE SET PUMP	2.60	1.00	2.60	0.87	0.87	0.87
9	0.76	2.28	HOT WATER CIRCULATION PUMP	0.40	1.00	0.40	0.40		
10	0.76	2.28	HOT WATER CIRCULATION PUMP	0.40	1.00	0.40	0.40		
11									
12			SPARE						
13									
	<b>146.24</b>	<b>438.71</b>		<b>77.00</b>	<b>10.00</b>	<b>77.00</b>	<b>25.80</b>	<b>25.80</b>	<b>25.40</b>

**BUSBAR (SHORT CIRCUIT)**

$$I_{sc} = 4 \times I_{total}$$

$$= 4 \times 336.77 \text{ A}$$

$$I_{sc} = 1347.08 \text{ A}$$

**JUNCTION WIRE & BREAKER**

$$I_{phase} = \frac{P}{V \times \cos \theta}$$

$$= \frac{9.13}{220 \times 0.8}$$

$$I_{phase} = 51.89 \text{ A}$$

$$I_{total} = I_{phase} + I_{starting current}$$

$$= 51.89 + 284.88$$

$$I_{total} = 336.77 \text{ A}$$

**WHERE:**

$$P = P_{(S/M/High/Low)} - P_{(S/T)}$$

$$= 25.80 - 16.67$$

$$P = 9.13 \text{ kW}$$

$$V = 220 \text{ Volt}$$

$$\cos \theta = 0.8$$

OF EQUIPMENT WITH HIGHEST STARTING CURRENT



Page 1

## POWER BALANCE

NO		DAYA (kW)		
		R	S	T
<b>JUNCTION LIGHTING</b>				
1	JL 1	3.16	3.18	3.18
2	JL 2	1.535	1.53	1.535
3	JL 3	1.25	1.23	1.23
4	JL 4	1.11	1.11	1.1
5	JL 5	1.22	1.24	1.2
6	JL 6	1.86	1.82	1.86
		10.135	10.11	10.105
<b>JUNCTION POWER</b>				
1	JP 1	36.23	35.69	35.01
2	JP 2	6.64	6.73	7.71
3	JP 3	0.98	1.33	1.51
4	JP 4	80.00	80.00	80.00
5	JP 5	60.00	60.00	60.00
6	JP 6	124.67	124.67	124.67
7	JP 7	33.26	33.16	32.85
		341.77	341.57	341.74
<b>JUNCTION MONITORING, COMMUNICATION, SAFETY EQUIPMENT</b>				
1	JM	1.7	2.4	1.8
2	JC	2.25	2.1	2.5
		3.95	4.50	4.30
<b>TOTAL</b>				
		355.86	356.18	356.15