



CONTRACTOR :
PETROCHEMICAL INDUSTRIES
DESIGN & ENGINEERING Co.
PROJ. NO. : 1203

SABALAN METHANOL PROJECT

COVER SHEET



OWNER :
SABALAN PETROCHEMICAL
INDUSTRIES CO.
PROJ. NO. : 89/S-G/102

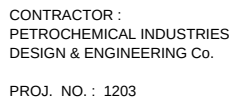
ELECTRICAL LOAD BALANCE SUMMARY

DOCUMENT NO : **1203-00-EL-CSH-003**

TOTAL PAGES : **21** (Excluding Cover & Revision Index Sheets)

AS-BUILT

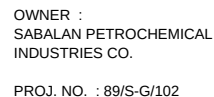
ED		EXT	ASB		R	
Eng. Phase		Purpose Of Distribution (POD)	Purpose Of Issue (POI)		Owner's Action	
02	21.11.2021	AS-BUILT	M.S.SABERI	M.LOTFI	M.LOTFI	N.JAFARPOUR
01	21.11.2018	CERTIFIED FINAL (WITH HOLD)	M.S.SABERI	M.LOTFI	M.LOTFI	N.JAFARPOUR
00	22.06.2011	ISSUED FOR ENGINEERING	A.MONAVARI	M.LOTFI	M.LOTFI	N.JAFARPOUR
REV.	DATE	DESCRIPTION	PREPARED BY	CHECKED BY	APPROVED BY	PROJECT



ELECTRICAL LOAD BALANCE SUMMARY

DOC. NO. : 1203-00-EL-CSH-003

REV.: 02



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PROJ. NO. : 1203

SABALAN METHANOL PROJECT

ELECTRICAL LOAD BALANCE SUMMARY (INDEX)

DOCUMENT NO.: 1203-00-EL-CSH-003



OWNER :
SABALAN PETROCHEMICAL
INDUSTRIES CO.

PROJ. NO. : 89/S-G/102

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SABALAN METHANOL PROJECT

ELECTRICAL LOAD BALANCE SUMMARY (NOTES)

DOCUMENT NO.: 1203-00-EL-CSH-003

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OWNER :
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INDUSTRIES CO.
PROJ. NO. : 89/S-G/102

Notes/ Explanation of Terms

Shaft Power (kW):	Mechanical Power Input to Drive Shaft or Absorbed. Electrical Power for Non-motor Loads
Rated Power (kW):	Motor Nameplate or Feeder Power rating.
Demand Factor:	Expressed as ratio of Shaft Power to the Rated Power.
Continuous (X):	Continuous Operation Absorbed Electrical Load.
Intermittent (Y):	Intermittent Operation Absorbed Electrical Load.
Standby/Spare (Z):	Standby (spare to mechanically driven equipment) or Spare (spare to motor driven equipment) Operation Absorbed Electrical Load
Load Operation Factors: (a, b, c)	Diversity Factors applied to Continuous, Intermittent and Standby/Spare Electrical Loads to represent plant operating conditions. Where:- a = 1.0 ; applied to the sum of Continuous operating loads. b = 0.5 ; applied to the sum of Intermittent operating loads or modified to account for the largest intermittent drive or consumer, whichever is the greater. c = 0.1 ; applied to the sum of Standby/Spare drives or modified to account for the largest Standby/Spare drive or consumer, whichever is the greater (not including secondary selective transformer loads).
Duty:	Mode of operation, where C = Continuous, I = Intermittent, S = Standby.

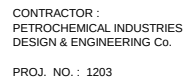
Notes

- 1- This document has been finalized based on the process final equipment lists.
- 2- Where transformers are used in secondary selective schemes, future projected load shall be accounted for by the transformer forced cooled (FA) rating, where there is a provision for forced cooling.
For radially connected transformers the OA rating shall be equal to or greater than the maximum operating load plus projected future load.
- 3- As a minimum, the transformer rating should allow for the continuous running of the largest standby or spare drive.
- 4- Pumps MP-5012A/B come in service immediately after DG running through FCS.(in Less than 10Sec.)

Calculations

Demand Factor:	Shaft kW / Rated kW
Absorbed kW:	Shaft kW / Efficiency at Demand
Absorbed kVA:	Absorbed kW * TAN (COS ⁻¹ (Power Factor at Demand))
Maximum Normal Load:	aX + bY
Peak Load:	aX + bY + cZ
Peak kVA:	SQRT ((Peak kW) ² + (Peak kVA) ²)

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ELECTRICAL LOAD BALANCE (SWITCHBOARD SUMMARY)										REV. : 02				
DOCUMENT NO.: 1203-00-EL-CSH-003														
Rev. No.	Switchboard Reference	Switchboard Name	Calculated Maximum Demand [A]			Peak Unknown Future Load [B]	Design Development Allowance [C] = (A+B) * 0.1	Future Spare Capacity of 20% [D] = (A+B) * 0.2	TOTAL LOAD [E] = (A+B+C+D)	Transformer Reference	Transformer Type ONAN/ONAF	Preferred Rating (OA)	Remarks	
			Load Data			TRANSFORMER SIZING CALCULATION								
			kW	kVAr	KVA	kVA	kVA	kVA	kVA			MVA		
02	SS-SWB2-01	6kV Switchgear No.1	12402.93	6596.39	14047.95			2809.59	16857.54	SS-TR1A/B-01	ONAN	17.5	TOTAL PLANT LOAD IN MAXIMUM CASE (INCLUDING 500KW FOR NON INDUSTRIAL BUILDINGS)	
02	SS-SWB2A-01	6kV Switchgear No.1, Bus A	6055.67	3225.45	6861.10			1372.22	8233.32	SS-TR1A-01				
02	SS-SWB2B-01	6kV Switchgear No.1, Bus B	6347.25	3370.94	7186.85			1437.37	8624.22	SS-TR1B-01				
02	SS-SWB3-01	400V Switchboard No.1	1397.14	469.70	1473.99			294.80	1768.78	SS-TR2A/B-01	ONAN	2		
02	SS-SWB3A-01	400V Switchboard No.1, Bus A	629.75	210.23	663.91			132.78	796.69	SS-TR2A-01				
02	SS-SWB3B-01	400V Switchboard No.1, Bus B	767.40	259.48	810.08			162.02	972.10	SS-TR2B-01				
02	SS-SWB3-02	400V Switchboard No.2	1379.40	457.51	1453.30		145.33	290.66	1889.28	SS-TR2A/B-02	ONAN	2		
02	SS-SWB3A-02	400V Switchboard No.2, Bus A	724.44	243.11	764.14		76.41	152.83	993.38	SS-TR2A-02				
02	SS-SWB3B-02	400V Switchboard No.2, Bus B	654.97	214.40	689.16		68.92	137.83	895.91	SS-TR2B-02				
01	SS-SWB3-03	400V Switchboard No.3	1334.51	666.82	1491.83			298.37	1790.20	SS-TR2A/B-03	ONAN	2		
01	SS-SWB3A-03	400V Switchboard No.3, Bus A	667.25	333.41	745.92			149.18	895.10	SS-TR2A-03				
01	SS-SWB3B-03	400V Switchboard No.3, Bus B	667.25	333.41	745.92			149.18	895.10	SS-TR2B-03				
01	SS-SWB3-04	400V Switchboard No.4	1293.46	612.21	1431.03			286.21	1717.23	SS-TR2A/B-04	ONAN	2		
01	SS-SWB3A-04	400V Switchboard No.4, Bus A	646.73	306.10	715.51			143.10	858.62	SS-TR2A-04				
01	SS-SWB3B-04	400V Switchboard No.4, Bus B	646.73	306.10	715.51			143.10	858.62	SS-TR2B-04				
01	SS-SWB3-05	400V Switchboard No.5	1210.24	491.07	1306.08			261.22	1567.29	SS-TR2A/B-05	ONAN	2		
01	SS-SWB3A-05	400V Switchboard No.5, Bus A	605.12	245.54	653.04			130.61	783.65	SS-TR2A-05				
01	SS-SWB3B-05	400V Switchboard No.5, Bus B	605.12	245.54	653.04			130.61	783.65	SS-TR2B-05				
02	SS-ESWB3-01	400V Emergency Switchboard No.1	376.93	141.16	402.49		40.25	80.50	523.24	SS-TR2A/B-06	ONAN	1		
02	SS-ESWB3A-01	400V Emergency Switchboard No.1, Bus A	216.07	92.89	235.20		23.52	47.04	305.75	SS-TR2A-06				
02	SS-ESWB3B-01	400V Emergency Switchboard No.1, Bus B	160.85	48.26	167.94		16.79	33.59	218.32	SS-TR2B-06				
01	SS-ESWB3-01_Emergency Case	400V Emergency Switchboard No.1	549.53	262.28	608.91								DG RATING CONSIDERING MOTOR GROUP RESTARTING AND 25% SPARE CAPACITY IS OBTAINED 1200KVA.	



ELECTRICAL LOAD BALANCE
(TOTAL LOADS AT PLANT START UP)

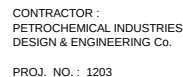
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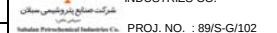
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			ELECTRICAL LOAD BALANCE (LV LOADS AT PLANT START UP)																	
			DOCUMENT NO.: 1203-00-EL-CSH-003												REV. : 02					
LOADS ON THE LV SWITCHBOARDS																				
S/N	Rev.	Load Name	Item Type	Description	Shaft Power(A)	Rated Power(B)	Demand factor (A/B)	Efficiency @ Demand	Power Factor @ Demand	Duty	Absorbed		Continuous (X)		Intermittent (Y)		Standby or Spare (Z)		Remarks	
					kW	kW	p.u	%	%		kW	kVAr	kW	kVAr	kW	kVAr	kW	kVAr		
1	01	C2001-MP-1B	M	Auxiliary Lube Oil Pump for C2001	1.5	2.2	0.68	84.70	0.76	C	1.77	1.51	1.77	1.51						
2	02	C2001-MF-1	M	Noise Hood Cooling Fan No.1 for C2001	0.4	0.55	0.73	83.60	0.68	C	0.48	0.52	0.48	0.52						
2	02	C2001-MF-2	M	Noise Hood Cooling Fan No.2 for C2001	0.4	0.55	0.73	83.60	0.68	C	0.48	0.52	0.48	0.52						
3	02	C2001-HE-1	H1	Oil Heater No.1 for C2001	1.5	1.5	1.00	100.00	1.00	C	1.50	0.00	1.50	0.00						
4	01	C2002-MP-1B	M	Auxiliary Lube Oil Pump for C2002	1.25	2.2	0.57	79.60	0.65	C	1.57	1.84	1.57	1.84						
5	02	C2002-HE-1	H1	Oil Heater No.1 for C2002	2	2	1.00	100.00	1.00	C	2.00	0.00	2.00	0.00						
6	02	C2002-HE-2	H1	Oil Heater No.2 for C2002	2	2	1.00	100.00	1.00	C	2.00	0.00	2.00	0.00						
7	01	FT2001-MP-1	M	Main Lube Oil Pump for FT2001	2.32	3.7	0.63	85.00	0.75	C	2.73	2.41	2.73	2.41						
8	01	FT2001-MP-2	M	Auxiliary Lube Oil Pump for FT2001	2.32	3.7	0.63	85.00	0.75	C	2.73	2.41	2.73	2.41						
9	02	FT2001-HE-1	H	Lube Oil Heater for FT2001	3	3	1.00	100.00	1.00	C	3.00	0.00	3.00	0.00						
10	02	FT2002-MP-1	M	Main Lube Oil Pump for FT2002	2.32	3.7	0.63	85.00	0.75	C	2.73	2.41	2.73	2.41						
11	02	FT2002-MP-2	M	Auxiliary Lube Oil Pump for FT2002	2.32	3.7	0.63	85.00	0.75	C	2.73	2.41	2.73	2.41						
12	02	FT2002-HE-1	H	Lube Oil Heater for FT2002	3	3	1.00	100.00	1.00	C	3.00	0.00	3.00	0.00						
13	02	FT7001A-MP-1A	M	Main Lube Oil Pump for FT7001A	9.9	15	0.66	91.40	0.78	C	10.83	8.69	10.83	8.69						
14	02	FT7001A-MP-1B	M	Emergency Lube Oil Pump for FT7001A	9.9	15	0.66	91.40	0.78	S	10.83	8.69					10.83	8.69		
15	01	FT7001A-MF-1	M	Oil Mist Fan for FT7001A	0.7	1.1	0.64	79.60	0.83	C	0.88	0.59	0.88	0.59						
16	02	FT7001A-HE-1	H	Lube Oil Heater No.1 for FT7001A	6	6	1.00	100.00	1.00	C	6.00	0.00	6.00	0.00						
17	02	FT7001A-HE-2	H	Lube Oil Heater No.2 for FT7001A	6	6	1.00	100.00	1.00	C	6.00	0.00	6.00	0.00						
18	01	FT7001B-MP-1A	M	Main Lube Oil Pump for FT7001B	9.9	15	0.66	91.40	0.78	C	10.83	8.69	10.83	8.69						
19	02	FT7001B-MP-1B	M	Emergency Lube Oil Pump for FT7001B	9.9	15	0.66	91.40	0.78	S	10.83	8.69					10.83	8.69		
20	01	FT7001B-MF-1	M	Oil Mist Fan for FT7001B	0.7	1.1	0.64	79.60	0.83	C	0.88	0.59	0.88	0.59						
21	02	FT7001B-HE-1	H	Lube Oil Heater No.1 for FT7001B	6	6	1.00	100.00	1.00	C	6.00	0.00	6.00	0.00						
22	02	FT7001B-HE-2	H	Lube Oil Heater No.2 for FT7001B	6	6	1.00	100.00	1.00	C	6.00	0.00	6.00	0.00						
23	01	P7001C-MP-1A	M	Main Lube Oil Pump for P7001C	1.38	2.2	0.63	84.20	0.75	C	1.64	1.45	1.64	1.45						
24	01	P7001C-MP-1B	M	Emergency Lube Oil Pump for P7001C	1.38	2.2	0.63	84.20	0.75	S	1.64	1.45					1.64	1.45		
25	01	P7001C-MF-1	M	Oil Mist Fan for P7001C	0.72	1.1	0.65	79.60	0.83	C	0.90	0.61	0.90	0.61						
26	02	P7001C-HE-1	H	Lube Oil Heater No.1 for P7001C	4	4	1.00	100.00	1.00	C	4.00	0.00	4.00	0.00						
27	02	P7001C-HE-2	H	Lube Oil Heater No.2 for P7001C	4	4	1.00	100.00	1.00	C	4.00	0.00	4.00	0.00						
28	01	FT8001A-MP-1A	M	Main Lube Oil Pump for FT8001A	15.25	18.5	0.82	91.50	0.76	C	16.67	14.25	16.67	14.25						
29	01	FT8001A-MP-1B	M	Emergency Lube Oil Pump for FT8001A	15.25	18.5	0.82	91.50	0.76	S	16.67	14.25					16.67	14.25		
30	01	FT8001A-MF-1	M	Oil Mist Fan for FT8001A	0.7	1.1	0.64	79.60	0.83	C	0.88	0.59	0.88	0.59						
31	02	FT8001A-HE-1	H	Lube Oil Heater No.1 for FT8001A	6	6	1.00	100.00	1.00	C	6.00	0.00	6.00	0.00						
32	02	FT8001A-HE-2	H	Lube Oil Heater No.2 for FT8001A	6	6	1.00	100.00	1.00	C	6.00	0.00	6.00	0.00						
33	02	FT8001A-HE-3	H	Lube Oil Heater No.3 for FT8001A	6	6	1.00	100.00	1.00	C	6.00	0.00	6.00	0.00						
34	01	FT8001B-MP-1A	M	Main Lube Oil Pump for FT8001B	15.25	18.5	0.82	91.50	0.76	C	16.67	14.25	16.67	14.25						
35	01	FT8001B-MP-1B	M	Emergency Lube Oil Pump for FT8001B	15.25	18.5	0.82	91.50	0.76	S	16.67	14.25					16.67	14.25		
36	01	FT8001B-MF-1	M	Oil Mist Fan for FT8001B	0.7	1.1	0.64	79.60	0.83	C	0.88	0.59	0.88	0.59						
37	01	FT8001B-HE-1	H	Lube Oil Heater for FT8001B	6	6	1.00	100.00	1.00	C	6.00	0.00	6.00	0.00						
38	01	FT8001B-HE-2	H	Lube Oil Heater for FT8001B	6	6	1.00	100.00	1.00	C	6.00	0.00	6.00	0.00						
39	01	FT8001B-HE-3	H	Lube Oil Heater for FT8001B	6	6	1.00	100.00	1.00	C	6.00	0.00	6.00	0.00						
40	01	MC-0001	M	Emergency Instrument Air Compressor	7.5	11	0.68	90.10	0.82	C	8.32	5.81	8.32	5.81						
41	01	MF-8001A	M	Cooling Tower Fan	91.7	110	0.83	94.80	0.80	C	96.73	72.55	96.73	72.55						
42	01	MF-8001B	M	Cooling Tower Fan	91.7	110	0.83	94.80	0.80	C	96.73	72.55	96.73	72.55						
43	01	MF-8001C	M	Cooling Tower Fan	91.7	110	0.83	94.80	0.80	C	96.73	72.55	96.73	72.55						
44	01	MF-8001D	M	Cooling Tower Fan	91.7	110	0.83	94.80	0.80	C	96.73	72.55	96.73	72.55						
45	01	MP-0001A	M	Cooling Water Blow-Down Pump	11.31	15	0.75	92.40	0.89	C	12.24	6.27	12.24	6.27						
46	01	MP-0001B	M	Cooling Water Blow-Down Pump	11.31	15	0.75	92.40	0.89	S	12.24	6.27					12.24	6.27		
47	01	MP-2001A	M	Process Condensate Pump No 1	38.66	55	0.70	94.30	0.85	C	41.00	25.41	41.00	25.41						
48	01	MP-2001B	M	Process Condensate Pump No 1	38.66	55	0.70	94.30	0.85	S	41.00	25.41					41.00	25.41		
49	01	MP-2002A	M	Process Condensate Pump No 2	122.35	150	0.82	95.60	0.88	C	127.98	69.08	127.98	69.08						
50	01	MP-2002B	M	Process Condensate Pump No 2	122.35	150	0.82	95.60	0.88	S	127.98	69.08					127.98	69.08		
51	01	MP-2003A	M	Process Condensate Pump No 3	129.23	150	0.86	95.60	0.88	C	135.18	72.96	135.18	72.96						
52	01	MP-2003B	M	Process Condensate Pump No 3	129.23	150	0.86	95.60	0.88	S	135.18	72.96					135.18	72.96		
53	01	MP-3012A	M	Main Lube Oil Pump for C3001	61	75	0.81	95.00	0.88	C	64.21	34.66	64.21	34.66						
54	01	MP-3012B	M	Standby Lube Oil Pump for C3001	61	75	0.81	95.00	0.88	S	64.21	34.66					64.21	34.66		
55	02	MP-3013	M	Emergency Lube Oil Pump for C3001	8.2	11	0.75	92.00	0.80	S	8.91	6.68					8.91	6.68		
56	01	MP-3015	M	Pump for Hydraulic Barring Gear	0.42	0.55	0.76	77.84	0.67	C	0.54	0.60	0.54	0.60						
57	01	H-3012	H	Lube Oil Heater	18	18	1.00	100.00	1.00	C	18.00	0.00	18.00	0.00						
58	01	H-3013-TCP	F	Seal Gas Heater Thristor Control Panel	30	30	0.80	100.00	1.00	C	30.00	0.00	30.00	0.00						
59	01	MP-3001	M	Slops Methanol Pump	7.22	11	0.66	91.20	0.84	C	7.92	5.11	7.92	5.11						
60	01	MP-5012A	M	Methanol Start Up Pump	24.2	45	0.54	94.20	0.83	C	25.69	17.26	25.69	17.26						



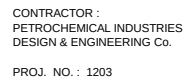
**ELECTRICAL LOAD BALANCE
(LV LOADS AT PLANT START UP)**

REV : 02



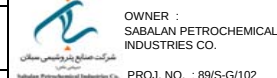
REV : 02

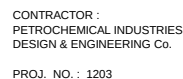
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ELECTRICAL LOAD BALANCE
(NORMAL OPERATION) MAXIMUM CASE

REV : 02

[illegible]



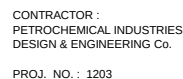
ELECTRICAL LOAD BALANCE
(NORMAL OPERATION) MAXIMUM CASE

REV : 02



6KV SWITCHGEAR - SS-SWB2B-01

[illegible]



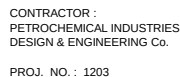
ELECTRICAL LOAD BALANCE (NORMAL OPERATION)

REV : 02



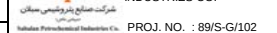
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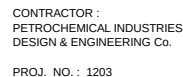
ELECTRICAL LOAD BALANCE (NORMAL OPERATION)

REV : 02



REV : 02

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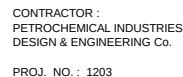
ELECTRICAL LOAD BALANCE (NORMAL OPERATION)

REV : 02



REV : 02

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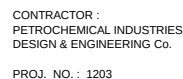
ELECTRICAL LOAD BALANCE (NORMAL OPERATION)

REV : 02



REV : 02

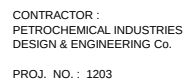
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ELECTRICAL LOAD BALANCE (NORMAL OPERATION)

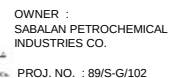
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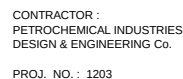
ELECTRICAL LOAD BALANCE (NORMAL OPERATION)

REV : 02



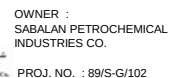
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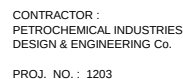
ELECTRICAL LOAD BALANCE (NORMAL OPERATION)

REV : 02



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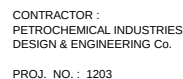
ELECTRICAL LOAD BALANCE (NORMAL OPERATION)

REV : 02



REV : 02

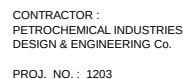
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ELECTRICAL LOAD BALANCE (NORMAL OPERATION)

REV : 02

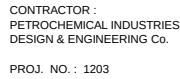
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ELECTRICAL LOAD BALANCE (NORMAL OPERATION)

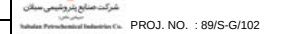
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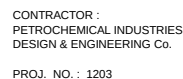
ELECTRICAL LOAD BALANCE (EMERGENCY CASE)

REV. : 02



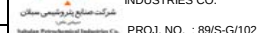
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SHEET 19 OF 21



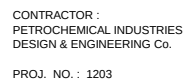
ELECTRICAL LOAD BALANCE (NORMAL OPERATION)

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ELECTRICAL LOAD BALANCE (NORMAL OPERATION)

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