



NISOC

نگهداشت و افزایش تولید میدان نفتی بینک
سطح الارض

احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک



ELECTRICAL LOAD LIST

شماره پیمان:

۰۵۳ - ۰۷۳ - ۹۱۸۴

پروژه

BK

بسته کاری

GCS

صادر کننده

PEDCO

تسهیلات

120

رشته

EL

نوع مدرک

LI

سریال

0001

نسخه

D07

شماره صفحه: ۱ از ۷

طرح نگهداشت و افزایش تولید ۲۷ مخزن

ELECTRICAL LOAD LIST

نگهداشت و افزایش تولید میدان نفتی بینک

D07	July.2024	IFA	H.Shakiba	M.Fakharian	M.Sadeghian	
D06	Jan.2024	IFA	H.Shakiba	M.Fakharian	S.Faramarzpour	
D05	Feb.2023	IFA	H.Shakiba	M.Fakharian	M.Mehrshad	
D04	Jul.2022	IFA	H.Shakiba	M.Fakharian	M.Mehrshad	
D03	May.2022	IFA	H.Shakiba	M.Fakharian	M.Mehrshad	
D02	Mar.2022	IFA	H.Shakiba	M.Fakharian	M.Mehrshad	
D01	Jan.2022	IFA	H.Shakiba	M.Fakharian	M.Mehrshad	
D00	Nov.2021	IFC	H.Shakiba	M.Fakharian	M.Mehrshad	
Rev.	Date	Purpose of Issue / Status	Prepared by:	Checked by:	Approved by:	Client Approval

Class: 1

Client Doc. Number: F0Z-709066

status:

IDC: Inter-Discipline Check

IFC: Issued For Comment

IFA: Issued For Approval

AFD: Approved For Design

AFC: Approved For Construction

AFP: Approved For Purchase

AFQ: Approved For Quotation

IFI: Issued For Information

AB-R: As-Built for CLIENT Review

AB-A: As-Built -Approved



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ELECTRICAL LOAD LIST



شماره پیمان:

۰۵۳ - ۰۷۳ - ۹۱۸۴

نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه
D07	0001	LI	EL	120	PEDCO	GCS	BK

شماره صفحه: ۲ از ۷

REVISION RECORD SHEET

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4	X	X			X
5	X	X	X	X	X
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تجهه‌داشت و افزایش تولید میدان نفتی بینک
سطح الارض

احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک



ELECTRICAL LOAD LIST

شماره پیمان:

۰۵۳-۰۷۳-۹۱۸۴

پروژه

بسته کاری

صادرکننده

تسهیلات

رشته

نوع مدرک

سریال

نسخه

BK

GCS

PEDCO

120

EL

LI

0001

D07

شماره صفحه: ۷ از ۳

Service Type:

N : Normal Load

E : Emergency Load

Load Duty:

C : Continuous Load

I : Intermitant Load

S : Stand By Load

LR/FL: Loacked Rotor / Full Load Current

Load Type:

M: Motor

F: Non-Motor

Definition of API Factor

1.25 for Motor Power < 22kW,

1.15 for Motor Power between, 22kW and 55kW

1.1 for Motor Power > 55kW

Height derating factor can be determined as follows if no manufacturer data is available:

Height Above Sea Level	Height Factor
< 1000 m	1
1000 < Height < 1500 m	0.97
1500 m >	0.94

Coolant (Cooling) Factor is 0.88 according to basic document for motor feeder type.

LV Feeder Type:

F1: Simple 4-Pole MCCB Feeder with Thermal/Magnetic Trips, for I<63A Feeders

F2: Simple 4-Pole MCCB Feeder with Thermal/Magnetic Trips, for 63A=<I<100A Feeders

F3: Simple 4-Pole MCCB Feeder with Thermal/Magnetic Trips, for 100A=<I Feeders

F4: Simple 3-Pole MCCB Feeder with Thermal/Magnetic Trips, for I<63A Feeders

F5: Simple 3-Pole MCCB Feeder with Thermal/Magnetic Trips, for 63A=<I<100A Feeders

F6: Simple 3-Pole MCCB Feeder with Thermal/Magnetic Trips, for 100A=<I Feeders

F7: Simple 2-Pole MCCB Feeder for Feeding Single Phase Loads (Ph+N or 2-Ph)

F8: Simple 2-Pole MCCB Feeder for Feeding Single Phase Loads (Ph+N or 2-Ph) with Contactor

F9: Simple 3-Pole MCCB Feeder for Feeding Three Phase Loads (3PH+N) with Contactor

M1: Direct on Line Motor Starter Feeders for $0.4 \leq P < 4kW$ (Switch Fuse + Contactor + Bimetal + R/L Signaling)

M2: Direct on Line Motor Starter Feeders for $4kW \leq P < 18.5kW$ (Switch Fuse + Contactor + Bimetal + R/L Signaling + R/L Ammeter)

M3: Direct on Line Motor Starter Feeders for $18.5kW \leq P < 30$ (Switch Fuse + Contactor + Bimetal + R/L Signaling + R/L Ammeter (49, 50G, Phase Control))

M4: Direct on Line Motor Starter Feeders for $30kW \leq P$ (Switch Fuse + Contactor + Overload CT + R/L Signaling + R/L Ammeter + Motor Protection Relay (49, 50G, Phase Control))

M5: Direct on Line Motor Starter Feeders for $0.55 kW \leq P < 18.5kW$ (Switch Fuse + Contactor + Bimetal + R/L Signaling + R/L Ammeter) for Package

MV Feeder Type:

C1: 11 KV Incoming Feeder

C2: Outgoing Transformer 2000 KVA

C3: Outgoing Motor Starter <1000 KW

C4: Bus Coupler 11 KV



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ELECTRICAL LOAD LIST

شماره پیمان:	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
	BK	GCS	PEDCO	120	EL	LI	0001	D07

۰۵۳-۰۳۳-۹۱۸۴

شماره صفحه: ۴ از ۷

Item NO	Rev	Bus	Equipment Number	Load Description	Service Type	Load Duty	Diversity Factor for Demand Load	NO Phases	Rated Voltage (V)	Load Type	Starting Method	BHP (Kw)	API Factor	Coolant Factor	Height Factor	Mechanical Power (Kw)	Rated Power (Kw)	EFF (%)	Power Factor	Load Factor (%)	LR/FL	Current Normal Operation(A)	Starting Conditions Current (A)	Absorbed Peak Active Power (Kw)	Absorbed Peak Reactive Power (Kvar)	Absorbed Peak Apparent Power (Kva)	Feeder Type
1	D07	GCS-11-SWG-001A	C-2101A	First & Second Stage Gas Compressor A	N	C	1	3	11	M	DOL	963.9	1.1	1	1	1060.29	1070	94.2	73	90.1	6	81.7	490.0	1023.25	957.995	1401.71	C3
2	D07	GCS-11-SWG-001B	C-2101B	First & Second Stage Gas Compressor B	N	C	1	3	11	M	DOL	963.9	1.1	1	1	1060.29	1070	94.2	73	90.1	6	81.7	490.0	1023.25	957.995	1401.71	C3
3	D07	GCS-11-SWG-001A	C-2101C	First & Second Stage Gas Compressor C	N	S	0.1	3	11	M	DOL	963.9	1.1	1	1	1060.29	1070	94.2	73	90.1	6	81.7	490.0	102.32	95.799	140.17	C3
4	D07	GCS-11-SWG-001B	P-2301A	Fire Water Electric Pump	N	I	0.75	3	3.3	M	DOL	180	1.1	0.88	1	250	300	92	82	60.0	6	69.57	417.44	146.74	102.42	178.95	C3
5	D03	GCS-11-SWG-001A	GCS-TR-001	Transformer-001 11/42 KV	N	C	1	3	11	F	-	-	-	-	-	1000	100	80	100.0	1	65.61	-	1000.00	750.00	1250.00	C2	
6	D03	GCS-11-SWG-001B	GCS-TR-002	Transformer-002 11/42 KV	N	C	1	3	11	F	-	-	-	-	-	1000	100	80	100.0	1	65.61	-	1000.00	750.00	1250.00	C2	

GCS-11-SWG-001A					
Continuous		Intermittent		Standby	
Active Power (Kw)	Reactive Power (Kvar)	Active Power (Kw)	Reactive Power (Kvar)	Active Power (Kw)	Reactive Power (Kvar)
2023.25	1707.99	0.00	0.00	102.32	95.80
Power Calculation		Active Power (Kw)	Reactive Power (Kvar)	Apparent power (KVA)	Power Factor
Maximum Normal Running Load		2023.25	1707.99	2647.79	0.76
Peak Load		2125.573	1803.794	2787.78	0.76
Peak Load				2787.783	

GCS-11-SWG-001B					
Continuous		Intermittent		Standby	
Active Power (Kw)	Reactive Power (Kvar)	Active Power (Kw)	Reactive Power (Kvar)	Active Power (Kw)	Reactive Power (Kvar)
2023.25	1707.99	146.74	102.42	0.00	0.00
Power Calculation		Active Power (Kw)	Reactive Power (Kvar)	Apparent power (KVA)	Power Factor
Maximum Normal Running Load		2169.99	1810.42	2826.03	0.77
Peak Load		2169.99	1810.42	2826.03	0.77
Peak Load				2826.033	

The **Peak** load on 11 Kv switchgear "GCS-11-SWG-001A" is 2650 KVA while demand load on "GCS-11-SWG-001B" is about 2742 KVA.

Fire water Pump will fed from 800 kVA transformer 11/3.3 KV, which will be finalized after power flow calculation.



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ELECTRICAL LOAD LIST

شماره پیمان:

۰۳-۰۳-۹۱۸۴

پرژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدارک	سریال	نسخه
BK	GCS	PEDCO	120	EL	LI	0001	D07

شماره صفحه: ۶ از ۷

Item NO	Rev	Bus	Equipment Number	Load Description	Service Type	Load Duty	Diversity Factor for Demand Load	NO Phases	Rated Voltage (V)	Load Type	Starting Method	BHP (Kw)	API Factor	Coolant Factor	Height Factor	Mechanical Power (Kw)	Rated Power (Kw)	Eff. (%)	Power Factor	Load Factor (%)	LR/FL	Current Normal Operation(A)	Absorbed Peak Active Power (Kw)	Absorbed Peak Reactive Power (Kvar)	Feeder Type
56	D07	GCS-400-NSWG-001E	GCS-110-UPS-Bypass	110VAC UPS By Pass	E	S	0.1	3	0.4	F	-	-	-	-	-	-	23.46	100	85	100.0	1	39.84	2.35	1.45	F1
57	D07	GCS-400-NSWG-001E	GCS-400-NON-UPS	Non UPS Emergency Distribution Panel	E	C	1	3	0.4	F	-	-	-	-	-	-	7.18	100	85	100.0	1	12.19	7.18	4.45	F1
58	D07	GCS-400-NSWG-001A		MOV 1	N	C	1	3	0.4	F	-	-	-	-	-	-	2	100	85	100.0	1	3.40	2.00	1.24	F1
59	D07	GCS-400-NSWG-001B		MOV 2	N	S	0.1	3	0.4	F	-	-	-	-	-	-	2	100	85	100.0	1	3.40	0.20	0.12	F1
60	D07	GCS-400-NSWG-001E	GCS-230-FDP 01	Fire Diesel Panel 01 (Electrical Main Motor)	E	C	1	1	0.23	F	-	-	-	-	-	-	1	100	85	100.0	1	2.95	1.00	0.62	F7
61	D07	GCS-400-NSWG-001E	GCS-230-FDP 02	Fire Diesel Panel 02 (Diesel Engine)	E	C	1	1	0.23	F	-	-	-	-	-	-	1	100	85	100.0	1	2.95	1.00	0.62	F7
62	D07	GCS-400-NSWG-001A	MCC-2101A	Auxiliary Panel for Gas Compressor C-2101A	N	C	1	3	0.4	F	-	-	-	-	-	-	43.1	100	85	100.0	1	73.19	43.10	26.71	F2
63	D07	GCS-400-NSWG-001B	MCC-2101B	Auxiliary Panel for Gas Compressor C-2101B	N	C	1	3	0.4	F	-	-	-	-	-	-	43.1	100	85	100.0	1	73.19	43.10	26.71	F2
64	D07	GCS-400-NSWG-001B	MCC-2101C	Auxiliary Panel for Gas Compressor C-2101C	N	S	0.1	3	0.4	F	-	-	-	-	-	-	43.1	100	85	100.0	1	73.19	4.31	2.67	F2
65	D07	GCS-400-NSWG-001E	SPH-01	Space Heater & Lighting for New LV Switchgear	E	E	1	3	0.23	F	-	-	-	-	-	-	0	100	85	100	1	0.00	0.00	0.00	
66	D07	GCS-400-NSWG-001E	SPH-02	Space Heater & Lighting for MV Switchgear	E	E	1	3	0.23	F	-	-	-	-	-	-	0	100	85	100	1	0.00	0.00	0.00	
67	D07	GCS-400-NSWG-001E	GCS-400-EDP-CRM	Control Room Emergency Lighting Panel	E	C	1	3	0.4	F	-	-	-	-	-	-	10	100	85	100	1	16.98	10.00	6.20	F1
68	D07	GCS-400-NSWG-001B	GCS-400-HVAC-CRM1	Control Room Emergency Distribution Panel for HVAC 1	B	S	0.1	3	0.4	F	-	-	-	-	-	-	97.9	100	85	100.0	1	166.24	9.79	6.07	F1
69	D07	GCS-400-NSWG-001E	GCS-400-HVAC-CRM2	Control Room Normal Distribution Panel for HVAC 2	E	C	1	3	0.4	F	-	-	-	-	-	-	97.9	100	85	100.0	1	166.24	97.90	60.67	F3
70	D07	GCS-400-NSWG-001E	GCS-400-EDP-SWHVAC	Switchgear Emergency Distribution Panel & HVAC	E	C	1	3	0.4	F	-	-	-	-	-	-	30	100	85	100.0	1	50.94	30.00	18.59	F1
71	D07	GCS-400-NSWG-001E	GCS-400-EDP-CCTV	GCS CCTV Emergency Distribution Panel & HVAC	E	C	1	3	0.4	F	-	-	-	-	-	-	11.69	100	85	100.0	1	19.85	11.69	7.24	F1
72	D07	GCS-400-NSWG-001B	GCS-400-EDP-WARE	Warehouse Emergency Distribution Panel & HVAC	N	C	1	3	0.4	F	-	-	-	-	-	-	10.2	100	85	100.0	1	17.32	10.20	6.32	F1
73	D07	GCS-400-NSWG-001E	EHTG	Electrical Heat-Tracing Panel	E	E	1	3	0.4	F	-	-	-	-	-	-	0	100	90	100.0	1	0.00	0.00	0.00	
74	D07	GCS-400-NSWG-001A	CAP-01	Capacitor Bank 1	N	C	1	3	0.4	F	-	-	-	-	-	-	-	100	100	100.0	1	173.21	-	120	F3
75	D07	GCS-400-NSWG-001B	CAP-02	Capacitor Bank 2	N	C	1	3	0.4	F	-	-	-	-	-	-	-	100	100	100.0	1	173.21	-	120	F3

GCS-400-NSWG-001A (Bus A Loading)						
Continuous		Intermittent		Standby		
P (Kw)	Q (Kvar)	P (Kw)	Q (Kvar)	P (Kw)	Q (Kvar)	
190.27	131.12	4.71	3.17	11.81	9.39	
Power Calculation		P (Kw)	Q (Kvar)	S (KVA)	PF	
Max. Normal Running Load		194.98	134.29	236.75	0.82	

GCS-400-NSWG-001B (Bus B Loading)						
Continuous		Intermittent		Standby		
P (Kw)	Q (Kvar)	P (Kw)	Q (Kvar)	P (Kw)	Q (Kvar)	
106.01	68.04	31.82	25.87	19.51	12.12	
Power Calculation		P (Kw)	Q (Kvar)	S (KVA)	PF	
Max. Normal Running Load		137.83	93.92	166.78	0.83	

GCS-400-NSWG-001E (Bus E Loading)						
Continuous		Intermittent		Standby		
P (Kw)	Q (Kvar)	P (Kw)	Q (Kvar)	P (Kw)	Q (Kvar)	
332.09	212.19	29.65	23.26	14.21	10.06	
Power Calculation		P (Kw)	Q (Kvar)	S (KVA)	PF	
Max. Normal Running Load		361.74	235.45	431.62	0.84	




GCS-400-NSWG-001A & 001B & 001E			
Max Intermittent		Max Standby (KW)	
(KW)	(KVAR)	(KW)	(KVAR)
15.42	11.96	9.79	6.07
20.56	15.95	97.90	60.67

GCS-400-NSWG-001E			
Max Intermittent		Max Standby (KW)	
(KW)	(KVAR)	(KW)	(KVAR)
15.42	11.96	8.15	5.69
20.56	15.95	81.52	56.90

GCS-400-NSWG-001A & 001B & 001E					
Continuous		Intermittent		Standby	
Active Power (Kw)	Reactive Power (Kvar)	Active Power (Kw)	Reactive Power (Kvar)	Active Power (Kw)	Reactive Power (Kvar)
628.37	411.36	66.18	52.31	45.53	31.58
Power Calculation		Active Power (Kw)	Reactive Power (Kvar)	Apparent power (KVA)	Power Factor
Maximum Normal Running Load (Demand)		694.55	463.66	835.10	0.83
Peak Load		792.452	495.241	934.48	0.85
Peak Load With 20% Spare (KVA)				1121.370	

GCS-400-NSWG-001E					
Continuous		Intermittent		Standby	
Active Power (Kw)	Reactive Power (Kvar)	Active Power (Kw)	Reactive Power (Kvar)	Active Power (Kw)	Reactive Power (Kvar)
332.09	212.19	29.65	23.26	14.21	10.06
Power Calculation		Active Power (Kw)	Reactive Power (Kvar)	Apparent power (KVA)	Power Factor
Maximum Normal Running Load		361.74	235.45	431.62	0.84
Peak Load		443.264	245.518	506.72	0.87
Peak Load With 20% Spare (KVA)				608.060	

- For each LV switchgear A & B, a separate transformer is needed to supply normal & emergency power. So the sum of apparent power will be about 1121.4KVA, which 2 transformers 1250 KVA are required.
- Size of transformers shall be finalized in load flow and motor starting study.
- Power factor has been calculated while all capacitor banks are out of service.

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض							 
	احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک							
ELECTRICAL LOAD LIST								
شماره پیمان:	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
۰۵۳ - ۰۷۳ - ۹۱۸۴	BK	GCS	PEDCO	120	EL	LI	0001	D07
شماره صفحه: ۷ از ۷								

1. Mechanical Power (KW): Mechanical Power for Motors = BHP(KW) x API Factor / (Cooling Factor x Height Factor)

2. Rated Power(KW): Rated Power = The Nearest Size of The Equipment to Mechanical Power of Motors

3. Load Factor(%): Load Factor = (BHP/Rated Power) x 100

4. Normal Operation(A): Normal Operation (A) = Rated Power / (Sqrt(3) x Nominal Voltage x cosØ)

5. Starting Current(A): Starting Current(A) = (LR/LF) x Normal Current

6. Electrical Power Demand (KW):

Electrical Absorbed Power Demand (KW) = BHP(KW) x Diversity Factor / Efficiency

Electrical Absorbed Power Demand (KW) = Rated Power(KW) x Diversity Factor / Efficiency

7. Electrical Reactive Power Demand (KVAR):

Electrical Reactive Power Demand (KVAR) = Electrical Absorbed Power Demand (KW) x Tangent(Ø)

For "Electrical Demand" calculation, following "Diversity Factors" has been considered (based on peak loads):

Continuous: 100% Diversity factor.

Intermittent: Normally less than 12 hours/day, As generally 75%

Standby: Spare/Backup drives or systems, As generally 10% or biggest standby load (which is bigger)

Note

1- Electrical heat tracing for compressor will be supplied from Auxiliary MCC of each one