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طرح نگهداشت و افزایش تولید 27 مخزن

UTILITY CONSUMPTION LIST

نگهداشت و افزایش تولید میدان نفتی بینک



| D02 | SEP.2022 | IFA | M.Aryafar | M.Fakharian | M.Mehrshad | |
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| D01 | MAR.2022 | IFA | M.Aryafar | M.Fakharian | M.Mehrshad | |
| D00 | DEC.2021 | IFC | M.Aryafar | M.Fakharian | M.Mehrshad | |
| Rev. | Date | Purpose of Issue/Status | Prepared by: | Checked by: | Approved by: | CLIENT Approval |

Class: 2

CLIENT Doc. Number: F0Z-708812

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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1.0 INTRODUCTION

Binak oilfield in Bushehr province is a part of the southern oilfields of Iran, is located 20 km northwest of Genaveh city.



With the aim of increasing production of oil from Binak oilfield, an EPC/EPD Project has been defined by NIOC/NISOC and awarded to Petro Iran Development Company (PEDCO). Also PEDCO (as General Contractor) has assigned the EPC-packages of the Project to "Hirgan Energy - Design and Inspection" JV.

As a part of the Project, a New Gas Compressor Station (adjacent to existing Binak GCS) shall be constructed to gather of 15 MMSCFD (approx.) associated gases and compress & transfer them to Siahmakan GIS.

GENERAL DEFINITION

The following terms shall be used in this document.

| | |
|------------------------------|--|
| CLIENT: | National Iranian South Oilfields Company (NISOC) |
| PROJECT: | Binak Oilfield Development – Surface Facilities; New Gas Compressor Station |
| EPD/EPC CONTRACTOR (GC): | Petro Iran Development Company (PEDCO) |
| EPC CONTRACTOR: | Joint Venture of : Hirgan Energy – Design & Inspection (D&I) Companies |
| VENDOR: | The firm or person who will fabricate the equipment or material. |
| EXECUTOR: | Executor is the party which carries out all or part of construction and/or commissioning for the project. |
| THIRD PARTY INSPECTOR (TPI): | The firm appointed by EPD/EPC CONTRACTOR (GC) and approved by CLIENT (in writing) for the inspection of goods. |
| SHALL: | Is used where a provision is mandatory. |
| SHOULD: | Is used where a provision is advisory only. |
| WILL: | Is normally used in connection with the action by CLIENT rather than by an EPC/EPD CONTRACTOR, supplier or VENDOR. |
| MAY: | Is used where a provision is completely discretionary. |

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2.0 SCOPE

This document gives the list and calculation for utility consumption for "BINAK Gas Compressor Station". It shall be used in conjunction with data/requisition sheets for Present document's Subject.

3.0 NORMATIVE REFERENCES

3.1 LOCAL CODES AND STANDARDS

- IPS-G-IN-200 General Standard For Instruments Air System
- IPS-E-PR-330 Process Design Of Compressed Air Systems

3.2 THE PROJECT DOCUMENTS

- BK-GNRAL-PEDCO-000-PR-DC-0001 Process Design Criteria
- BK-GCS-PEDCO-120-PR-UF-0001 Utility Flow Diagram (UFD)
- BK-GCS-PEDCO-120-PR-PI-0002~0025 P&IDs



3.3 ENVIRONMENTAL DATA

Refer to "Process Basis of Design; Doc. No. BK-GNRAL-PEDCO-000-PR-DB-0001".

3.4 ORDER OF PRECEDENCE

In case of any conflict between the contents of this document or any discrepancy between this document and other project documents or reference standards, this issue must be reported to the CLIENT. The final decision in this situation will be made by CLIENT.



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4.0 UTILITY CONSUMPTION LIST



Table 4-1: Overall GCS Utility Consumption



| SERVICE | DESCRIPTION | FUEL GAS | WATER | FUEL OIL | INSTRUMENT AIR | PLANT AIR | NITROGEN |
|--------------------------------|--|-----------------|-------------------|-------------------|--------------------|--------------------|--------------------|
| | | kg/h | m ³ /h | m ³ /h | Nm ³ /h | Nm ³ /h | Nm ³ /h |
| C-2101/2 A/B/C | 1 st Stage Gas Compressors | | | | 3 * 7 (NOTE 1) | | 3 * 6 (NOTE 1) |
| AE-2101 A/B/C | 1 st Stage Air Cooler | | | | 3 * 1 (NOTE 1) | | |
| AE-2102 A/B/C | 2 nd Stage Air Cooler | | | | 3 * 1 (NOTE 1) | | |
| PK-2204 | Nitrogen Package | | | | | 143 (NOTE 3) | |
| PK-DR-2203 | Air Dryer | | | | 23.9 | | |
| PK-2208 | Deleted | | | | | | |
| PK-2207 | Corrosion Inhibitor Package | | | 0.004 (NOTE 2) | | | |
| PK-2101 | Dehydration Package | 480 (NOTE 1) | | | 20 (NOTE 1) | | |
| IG-2201 | Flare Ignition Package and Flare Header Purge Gas | 26 | | | | | |
| PK-2206 | Diesel Generator Package | | | 0.13 (NOTE 2) | | | |
| TK-2101 | Deleted | | | | | | |
| TK-2101 | Lean Glycol Tank Blanketing | | | | | | 9.5 |
| V-2107 | Glycol Sump Drum Blanketing | | | | | | 2 |
| TK-2209 | Potable Water Tank | | 0.10 (NOTE 4) | | | | |
| P-2302 B/C | Fire Water Main Diesel Pump | | | 0.074 (NOTE 2) | | | |
| Control Valves & On/Off Valves | | | | | 44.8 (NOTE 2) | | |
| Work Shop and Ware House | | | | | | 30 | |
| Total | | 505.8 | 0.10 | 0.208 | 115.7 | 173 | 30.5 |

Note 1) Based on vendor data.

Note 2) Will be finalized later.

Note 3) The required air for nitrogen package is produced by separate compressor.

Note 4) Water consumption is not in material balance, because it is intermittent consumption.

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4.1 FUEL GAS CONSUMPTION CALCULATIN

Fuel gas consumption for flare header;

Header size: 10 inch = 0.406 m

Area: 0.051 m²

Purge velocity: 0.1 ft./s = 0.03 m/s

Fuel gas consumption: 14.2 Am³/hr = 21 kg/hr

Ignition panel consumption: 5 kg/hr

Dehydration package: 480 kg/hr (Based on vendor data)

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4.2 AIR CONSUMPTION CALCULATION

Instrument Air Consumption;

Control valve: 0.64 Nm³/hr

On/Off valve: 0.64 Nm³/hr

Air cooler variable pitch: 1 Nm³/hr

Each gas compressor train: 7 Nm³/hr

Dehydration package: 20 Nm³/hr (Based on vendor data)

Dryer regeneration: 20%

Over Design: 30%

Peak load: All valves are in transient condition.

29* control valves X 0.64 Nm³/hr = 18.56 Nm³/hr

41* On/Off valves X 0.64 Nm³/hr = 26.24 Nm³/hr



Note*: The number of control and on/off valves will be finalized later.

Air cooler variable pitch consumption = 6 X 1 Nm³/hr = 6 Nm³/hr

Gas compressor train = 3 * 7 Nm³/hr = 21 Nm³/hr

Dehydration package = 1 X 20 Nm³/hr = 20 Nm³/hr

Total instrument air for plant = 18.56 + 26.24 + 6 + 21 + 20 = 91.8 Nm³/hr

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Total continuous air required (Peak Load) = $91.8 \text{ Nm}^3/\text{hr} \times 30\%$ (Over Design) = $119 \text{ Nm}^3/\text{hr}$

Total instrument air = $119 \text{ Nm}^3/\text{hr} \times 20\%$ (Regeneration Factor) = $143 \text{ Nm}^3/\text{hr}$

Plant air Consumption: $30 \text{ Nm}^3/\text{hr}$

Total air requirement = $143 \text{ Nm}^3/\text{hr} + 30 \text{ Nm}^3/\text{hr} = 173 \text{ Nm}^3/\text{hr}$

4.3 FUEL OIL CONSUMPTION

Total fuel oil consumption for gas corrosion inhibitor: $0.004 \text{ m}^3/\text{hr}$

Fuel oil consumption for diesel fire water pump has been considered $0.074 \text{ m}^3/\text{hr}$ (based on NFPA20, 5 lit/day per kW)

Fuel oil consumption for diesel generator (500 kW 100% load) has been considered $0.13 \text{ m}^3/\text{hr}$ (based on vendor data)

Total fuel oil consumption for diesel generator and corrosion inhibitor: $0.004 + 0.13 = 0.134 \text{ m}^3/\text{hr}$
~ $3.24 \text{ m}^3/\text{day}$

Total fuel oil consumption for fire water diesel pump: $0.074 \text{ m}^3/\text{hr} \sim 1.78 \text{ m}^3/\text{day}$

4.4 POTABLE WATER

The potable water consumption is based on 125 lit./day per person, with considering 10 persons.

Potable water consumption: $10 \times 0.25 = 2.5 \text{ m}^3/\text{day}$



4.5 NITROGEN BLANKETING

Based on API 2000 for tanks smaller than 3180 m^3 (20000 bbl) the venting requirement due to thermal contraction is limited by the maximum temperature change of 56 K/h ($100 \text{ }^\circ\text{R/h}$) in the tank's vapour space. Using an initial temperature of $448.9 \text{ }^\circ\text{C}$ ($120 \text{ }^\circ\text{F}$), venting requirement is approximately equal to 0.169 Nm^3 of air per cubic meter.(1 SCFH of air per barrel) of empty tank volume.

| Lean Glycol Storage Tank | | |
|--------------------------------------|-------|------------------------|
| Height | 5 | m |
| LL | 0.6 | m |
| v | 55.29 | m^3 |
| 0.169 Nm^3 per Emoty Cubic | 9.34 | Nm^3/h |

| Glycol Sump Drum | | |
|--------------------------------------|-------|------------------------|
| Height | 1.1 | m |
| LL | 0.15 | m |
| v | 11.94 | m^3 |
| 0.169 Nm^3 per Emoty Cubic | 2.02 | Nm^3/h |