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| <br><b>NISOC</b> |  | <p>نگهداشت و افزایش تولید میدان نفتی بینک<br/>سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p> |           |            |        |      |  |       |                    |  |
| شماره پیمان: ۰۵۳-۰۷۳-۹۱۸۴                                                                        |  | MECHANICAL DATA SHEETS FOR GLYCOL DRAIN PUMP                                                                     |           |            |        |      |                                                                                     |       | شماره صفحه: ۱ از ۵ |  |
|                                                                                                  |  | پروژه                                                                                                            | بسته کاری | صادر کننده | تهیهات | رشته | نوع مدرک                                                                            | سریال | نسخه               |  |
|                                                                                                  |  | BK                                                                                                               | GCS       | PEDCO      | 120    | ME   | DT                                                                                  | 0035  | D04                |  |

طرح نگهداشت و افزایش تولید ۲۷ مخزن

MECHANICAL DATA SHEETS FOR GLYCOL DRAIN PUMP  
نگهداشت و افزایش تولید میدان نفتی بینک

|                                                                                                                                                                                                                                                                                                                                                                                                                              |           |                                |              |              |              |                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------------------------|--------------|--------------|--------------|-----------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                              |           |                                |              |              |              |                 |
| D04                                                                                                                                                                                                                                                                                                                                                                                                                          | JUN. 2023 | AFC                            | H. Adineh    | M. Fakharian | A.M.Mohseni  |                 |
| D03                                                                                                                                                                                                                                                                                                                                                                                                                          | SEP. 2022 | AFC                            | H. Adineh    | M. Fakharian | M. Mehrshad  |                 |
| D02                                                                                                                                                                                                                                                                                                                                                                                                                          | MAR. 2022 | IFA                            | H. Adineh    | M. Fakharian | M. Mehrshad  |                 |
| D01                                                                                                                                                                                                                                                                                                                                                                                                                          | JAN. 2022 | IFA                            | H. Adineh    | M. Fakharian | M. Mehrshad  |                 |
| D00                                                                                                                                                                                                                                                                                                                                                                                                                          | DEC. 2021 | IFC                            | H. Adineh    | M. Fakharian | M. Mehrshad  |                 |
| Rev.                                                                                                                                                                                                                                                                                                                                                                                                                         | Date      | Purpose of Issue / Status      | Prepared by: | Checked by:  | Approved by: | CLIENT Approval |
| Class: 1                                                                                                                                                                                                                                                                                                                                                                                                                     |           | CLIENT Doc. Number: F0Z-708863 |              |              |              |                 |
| status: <ul style="list-style-type: none"> <li>IDC: Inter-Discipline Check</li> <li>IFC: Issued For Comment</li> <li>IFA: Issued For Approval</li> <li>AFD: Approved For Design</li> <li>AFC: Approved For Construction</li> <li>AFP: Approved For Purchase</li> <li>AFQ: Approved For Quotation</li> <li>IFI: Issued For Information</li> <li>AB-R: As-Built for CLIENT Review</li> <li>AB-A: As-Built –Approved</li> </ul> |           |                                |              |              |              |                 |



نگهداشت و افزایش تولید میدان نفتی بینک  
سطح الارض

احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک



شماره پیمان:

۰۵۳-۰۷۳-۹۱۸۴

MECHANICAL DATA SHEETS FOR GLYCOL DRAIN PUMP

| نسخه | سریال | نوع مدرک | رشته | تسهیلات | صادرکننده | بسته کاری | پروژه |
|------|-------|----------|------|---------|-----------|-----------|-------|
| D04  | 0035  | DT       | ME   | 120     | PEDCO     | GCS       | BK    |

شماره صفحه: ۲ از ۵

REVISION RECORD SHEET

| page | D00 | D01 | D02 | D03 | D04 |
|------|-----|-----|-----|-----|-----|
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نگهداشت و افزایش تولید میدان نفتی بینک  
سطح الارض

احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک



شماره پیمان:

۰۵۳-۰۷۳-۹۱۸۴

MECHANICAL DATA SHEETS FOR GLYCOL DRAIN PUMP

| نسخه | سریال | نوع مدرک | رشته | تجهیزات | صادرکننده | بسته کاری | پروژه |
|------|-------|----------|------|---------|-----------|-----------|-------|
| D04  | 0035  | DT       | ME   | 120     | PEDCO     | GCS       | BK    |

شماره صفحه: ۳ از ۵

GENERAL NOTES

- Min. / Max. Design temperature (°C): 5 / 85
- For electrical motor descriptions, refer to 'Specification For LV and MV induction Motors' Doc. No. BK-GNRAL-PEDCO-000-EL-SP-0010 & 0017 .
- Vendor shall fill in the blanks and return the completed data sheet along with Motor data sheet, "Doc. No.: BK-GCS-PEDCO-120-EL-DT-0008 & 0009 with his proposal.
- Vendor shall submit ITP (Inspection & Testing Plan) with his proposal.
- The motors, pump coupling and pump accessories shall be supplied from the project's approved vendor list (A.V.L.).
- Vendor is requested to confirm the material, or propose appropriate alternative.
- Mechanical seal data sheet shall fill in by vendor as per API 682. Pump Manufacturer shall supply all instrumentation for mechanical seals as per API 682 4th Edition and project requirements.
- NPSH test shall be done & witnessed if the margin of NPSHr & NPSHa is less than 1.
- The Tie-in flanges shall conform to ASME B-16.5.
- Supplier to indicate which minimum flow pumps can achieve.
- Pumps shall be designed, fabricated, tested, and inspected in accordance with the requirements of ISO 5199 latest edition.
- Pump starts automatically with open delivery valve.
- The discharge line size is 2".
- Material class of 'I-1', 'I-2', 'S-1', 'S-2', 'S-3', 'S-4', 'S-5', 'S-6', 'C-6', 'A-7' and 'A-8', which is defined in API 610 table H.1, shall be provided with full chemical analysis and mechanical test certification to BS EN 10204:2004 "3.1".  
Material class of 'D-1' and 'D-2', which is defined in API 610 table H.1 and also titanium materials shall be provided with full chemical analysis and mechanical test certification to BS EN 10204:2004 "3.2".
- Based on project instrumentation specification, these equipments are classified as Type B (Connected to DCS/ESD):  
Centrifugal Pump Package
- Pump material shall be selected based on Annex H API 610 11th Edition. (Vendor to confirm)
- For pumps with vacuum suction pressure the minimum NPSH margin shall be 2 m. for other pumps the minimum
- 18 C ?  
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- 19 B Noted  
ed during mechanical run test.
- 20 Vendor to provide the pump with mentioned flow rate or minimum available flow rate at market.
- 21 Vapour pressure at max. pumping temperature is 0 bara.
- 22 Max Allowable Pressure at Shut-Off at rated impeller (bara): 5.7
- 23 For site conditions refer to process basis of design document; Doc.No: BK-GNRAL-PEDCO-000-PR-DB-0001.
- 24 Minimum Design Metal Tem (MDMT)= 5 (°C)
- 25 MAX. allow. sound press. level shall be 85 dBA.
- 26 Allowable external forces and moments on nozzle should be conformed to Spec. No.: BK-GCS-PEDCO-120-ME-SP-0004.
- 27 All drain and vents (If any) to be manifolded, valved and routed to the skid edge.
- 28 Min./Max. pumping temperature (°C): 5 / 50
- 29 Viscosity At Min. / Max. Temp.(cP): 85.86 / 25.06
- 30 Suction Pressure (Min. / Max.) (bara): 0.11 / 0.2
- 31 Hydraulic Power (kw): 0.18
- 32 Glycol drain pump is installed on Glycol sump drum. for further data refer to related P&ID; BK-GCS-PEDCO-120-PR-PI-0025 and Calculation Note For Pumps ; BK-GCS-PEDCO-120-PR-CN-0001.
- 33 Minimum flow shall be specified by vendor.

|                                                                                   |                        |                                                                                                                  |            |                                            |                |                          |                             |                                                                                     |                              |  |
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|  |                        | <p>نگهداشت و افزایش تولید میدان نفتی بینک<br/>سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p> |            |                                            |                |                          |                             |  |                              |  |
| شماره پیمان:                                                                      |                        | MECHANICAL DATA SHEETS FOR GLYCOL DRAIN PUMP                                                                     |            |                                            |                |                          |                             | شماره صفحه: ۴ از ۵                                                                  |                              |  |
| ۰۵۳-۰۷۳-۹۱۸۴                                                                      |                        | پروژه                                                                                                            | بسته کاری  | صادر کننده                                 | تهیه کننده     | رشته                     | نوع مدرک                    | سریال                                                                               | نسخه                         |  |
|                                                                                   |                        | BK                                                                                                               | GCS        | PEDCO                                      | 120            | ME                       | DT                          | 0035                                                                                | D04                          |  |
| ISO Std. 5199 CENTRIFUGAL PUMP DATA SHEET (SI UNIT)                               |                        |                                                                                                                  |            |                                            |                |                          |                             |                                                                                     |                              |  |
| Corporate name<br>NISOC                                                           |                        | Centrifugal pump Data sheet                                                                                      |            |                                            |                |                          |                             |                                                                                     | Rev.:                        |  |
|                                                                                   |                        |                                                                                                                  |            |                                            |                |                          |                             |                                                                                     | Data:                        |  |
|                                                                                   |                        |                                                                                                                  |            |                                            |                |                          |                             |                                                                                     | Name:                        |  |
| Plant: BINAK GCS                                                                  |                        | Service: GLYCOL DRAIN PUMP                                                                                       |            |                                            |                | Ref. Standards: ISO 5199 |                             |                                                                                     |                              |  |
|                                                                                   |                        | Ref. Spec. No.: BK-GCS-PEDCO-120-ME-SP-0004                                                                      |            |                                            |                |                          |                             |                                                                                     |                              |  |
| No. req.                                                                          | Pump type              | Eq. API-610 Type                                                                                                 |            | Mfr. serial No.                            | Kind of driver |                          | Drive, type, size           |                                                                                     | Item No.                     |  |
| 1                                                                                 | Vertical               | VS4 (VTC)                                                                                                        |            |                                            | Motor          |                          | LV Induction Electric Motor |                                                                                     | P-2104                       |  |
| Operation                                                                         | Standby                |                                                                                                                  |            |                                            |                |                          |                             |                                                                                     |                              |  |
| Drawings                                                                          | Installation dimension |                                                                                                                  |            |                                            | Pump weight    |                          | Pump Content                |                                                                                     |                              |  |
|                                                                                   | Assembly pump          |                                                                                                                  |            |                                            | Customer       |                          | Enquiry No.                 |                                                                                     | Date                         |  |
|                                                                                   | Assembly shaft seal    |                                                                                                                  |            |                                            | Supplier       |                          | Order No.                   |                                                                                     | Date                         |  |
|                                                                                   | Auxiliary system       |                                                                                                                  |            |                                            | Proposal No.   |                          | Contract No.                |                                                                                     |                              |  |
| Test (4)                                                                          | Material (16)          | Hydrostatic                                                                                                      | Inspection | Perform.                                   | NPSH (8)       | Sound Level              |                             |                                                                                     |                              |  |
| Refer.                                                                            | ISO 5199               | ISO 5199                                                                                                         | ISO 5199   | ISO 5199                                   | ISO 5199       | (26)                     |                             |                                                                                     |                              |  |
| Withn. by                                                                         | Certified              | Witnessed                                                                                                        | Witnessed  | Witnessed                                  | Witnessed      | Witnessed                |                             |                                                                                     |                              |  |
| MECHANICAL DATA SHEETS FOR GLYCOL DRAIN PUMP                                      |                        |                                                                                                                  |            |                                            |                |                          |                             |                                                                                     |                              |  |
| Liquid                                                                            | Type                   | TEG                                                                                                              |            | rated                                      | 3.30           | m³/h                     | NPSH at rated flow          | Plant- NPSHA                                                                        | 10.4 m                       |  |
| Solids                                                                            | %of mass               |                                                                                                                  |            | normal                                     | 3.00           | m³/h                     | Pump speed rated            | Pump- NPSH3                                                                         | m                            |  |
| Corrosion by                                                                      |                        |                                                                                                                  |            | min.                                       |                | m³/h                     | Pump efficiency rated       |                                                                                     | rpm                          |  |
| Op. Temp. (Min./Max.)                                                             | 5 / 50                 | °C                                                                                                               |            | Minimum flow required                      |                | m³/h                     | Pump power input rated (2)  |                                                                                     | %                            |  |
| pH-value at T <sub>op</sub>                                                       |                        |                                                                                                                  |            | Inlet gauge pressure (30)                  | rated          | barg                     | Pump power input            | rated impeller dia.                                                                 | kW                           |  |
| Density at T <sub>op</sub>                                                        | 1115                   | kg/m³                                                                                                            |            | max.                                       | 0.20           | barg                     | input                       | max. impeller dia.                                                                  | kW                           |  |
| Vapour press. at T <sub>op</sub>                                                  | (21)                   | bara                                                                                                             |            | Outlet gage pressure rated                 | 2.10           | barg                     |                             |                                                                                     |                              |  |
| Kinematic vis. at T <sub>op</sub>                                                 | (29)                   | cP                                                                                                               |            | Differential pressure rated                | 2.00           |                          |                             |                                                                                     | kW                           |  |
| Specific heat at T <sub>op</sub>                                                  |                        | J/Kg.K                                                                                                           |            | Total head rated                           | 18.30          |                          |                             |                                                                                     | kW                           |  |
|                                                                                   |                        |                                                                                                                  |            | Shut-off head                              | (22)           |                          |                             |                                                                                     |                              |  |
| Construction Features                                                             |                        |                                                                                                                  |            |                                            |                |                          |                             |                                                                                     |                              |  |
| Design                                                                            | barg                   | Max. allowable work press                                                                                        |            | By vendor                                  |                |                          |                             |                                                                                     |                              |  |
| Number of Stages                                                                  |                        | Test pressure                                                                                                    |            | 1.5 x MAWP                                 | barg           | Cooling (C) Series (s)   |                             | N.A.                                                                                |                              |  |
| Self priming                                                                      |                        |                                                                                                                  |            |                                            |                |                          |                             |                                                                                     |                              |  |
| Impeller diameter                                                                 | max                    | mm                                                                                                               |            | Inlet Flange                               | Size/Position  | He                       | this item shall be specify: |                                                                                     | Quantity                     |  |
|                                                                                   | rated                  | mm                                                                                                               |            | Rating/facing                              |                | Be                       | Hirgan Reply: by vendor     |                                                                                     |                              |  |
|                                                                                   | min                    | mm                                                                                                               |            | Outlet Flange                              | Size/Position  | Se                       |                             |                                                                                     |                              |  |
| Pump length vertical pumps                                                        |                        | mm                                                                                                               |            | Rating/facing (13)                         | 2" / Up        | Cooler for seal flush    |                             |                                                                                     |                              |  |
| Barrel dia. vertical pumps                                                        |                        | mm                                                                                                               |            | Vent connection                            | 150# / RF      | Oil cooler               |                             |                                                                                     |                              |  |
| Casing split                                                                      |                        |                                                                                                                  |            | Drain connection                           |                | Flush                    | Liquid                      | Quantity                                                                            |                              |  |
| Casing seal type                                                                  |                        |                                                                                                                  |            | Shaft seal manufacture                     |                | Lantern ring             |                             |                                                                                     |                              |  |
| Impeller type                                                                     |                        |                                                                                                                  |            | Type, size (7)                             | Mech. Seal     | Mechanical ring          |                             |                                                                                     |                              |  |
| Casing support                                                                    |                        |                                                                                                                  |            | Flush plan                                 | 11 (VTC)       | Gland/Seal plate         |                             |                                                                                     |                              |  |
| Rotation (looking from driver)                                                    |                        |                                                                                                                  |            | Material code                              |                | Coupling (18)            | Manufacture                 |                                                                                     |                              |  |
| Axial thrust reduction by                                                         |                        |                                                                                                                  |            | Soft packing ring dimension                |                | Type, Size               |                             |                                                                                     |                              |  |
| Total clearance                                                                   | Impeller               | mm                                                                                                               |            | Rad. Bearing                               | Type           | Diameter max             | mm                          |                                                                                     |                              |  |
|                                                                                   | Bal. Drum              | mm                                                                                                               |            | Axial. Bearing                             | Size           | Spacer length            | mm                          |                                                                                     |                              |  |
|                                                                                   | Shaft bushes           | mm                                                                                                               |            | Line shaft bearing                         |                |                          |                             |                                                                                     |                              |  |
|                                                                                   | Wear plate             | mm                                                                                                               |            | Bearing bracket No.                        |                |                          |                             |                                                                                     |                              |  |
| Wall thickness rot sheath / stat. cas                                             |                        |                                                                                                                  |            | Lubrication                                |                | Anchor bolts supplied by | Vendor                      |                                                                                     |                              |  |
|                                                                                   |                        |                                                                                                                  |            | Lubrication device                         |                | Driver                   | Supplied by                 | Vendor                                                                              |                              |  |
|                                                                                   |                        |                                                                                                                  |            |                                            |                | Mounted by               | Vendor                      |                                                                                     |                              |  |
| Site and Utility Data (23)                                                        |                        |                                                                                                                  |            |                                            |                |                          |                             |                                                                                     |                              |  |
| Location                                                                          | Partial sides          | Outdoor                                                                                                          | Unheated   | Site data:                                 |                | Elevation                | m                           | Barometer                                                                           | mbar                         |  |
| Winterization REQ'D                                                               |                        | Tropicalization REQ'D                                                                                            |            | Range of ambient temps: MIN/MAX            |                |                          |                             |                                                                                     | °C                           |  |
| Unusual condition                                                                 | Dust                   | Fumes                                                                                                            | Others     | Relative humidity: MIN/MAX                 |                |                          |                             |                                                                                     | %                            |  |
| Driver                                                                            | Volt. 400              | Hertz 50                                                                                                         | Phase 3    | Max Voltage Variation                      |                |                          |                             |                                                                                     | ± 5%                         |  |
| Type of protection                                                                |                        |                                                                                                                  |            | Max Frequency Variation                    |                |                          |                             |                                                                                     | ± 2%                         |  |
| Temperature rise class / Insulation class                                         |                        |                                                                                                                  |            | Max Volt. and Frequency Variation together |                |                          |                             |                                                                                     | ± 5%                         |  |
| Electric Area Classification                                                      | Zone 1, IIB, T3        |                                                                                                                  |            | Starting Method                            |                |                          |                             |                                                                                     | D.O.L.(Open Discharge Valve) |  |

