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| **طرح نگهداشت و افزایش تولید 27 مخزن** | | | | | | |
| **Relief Load Summery**  **نگهداشت و افزایش تولید میدان نفتی بینک** | | | | | | |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| D02 | Oct.2022 | IFA | M.Aryafar | M.Fakharian | M.Mehrshad |  |
| D01 | Apr.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-708814** | | | | |
| **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** | | | | | |

**REVISION RECORD SHEET**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
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| **6** | X | X | X |  |  | **71** |  |  |  |  |  |
| **7** | X | X | X |  |  | **72** |  |  |  |  |  |
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1. **INTRODUCTION**

Binak oilfield in Bushehr province is a part of the southern oilfields of Iran, is located 25 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 Fcilities; 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. |

1. **Scope**

The scope of this document is to present summary of flare loads in BINAK new gas compressor station unit.

1. **NORMATIVE REFERENCES**

## Local Codes and Standards

|  |  |
| --- | --- |
| * IPS-E-PR-450 | Process design of pressure relieving Systems inclusive safety relief valves |

## International Codes and Standards

|  |  |
| --- | --- |
| * API-STD-520 | Sizing, Selection and Installation of Pressure Relieving Devices in Refineries, Part 1-Sizing and Selection |
| * API-STD-521 | Pressure Relieving and Depressuring Systems |

## The Project Documents

|  |  |
| --- | --- |
| * BK-GNRAL-PEDCO-000-PR-DC-0001 | Process Design Criteria |
| * BK-GCS-PEDCO-120-PR-PF-0001 | Process Flow Diagram (PFD) |
| * BK-GCS-PEDCO-120-PR-PI-0002 ~ 0025 | Piping & Instrumentation Diagram |

## ENVIRONMENTAL DATA

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

1. **RELIEF LOAD SUMMARY TABLE**

D02

## PSV-2111/2112

|  |  |  |  |
| --- | --- | --- | --- |
| Location | V-2104 | | |
| Equipment Size (mm) | (ID X TL-TL) 4200 X 12600 | | |
| Case | Wetted Fire | Gas Expansion | Blocked Outlet |
| Fluid & State | HC | | |
| Operating Pressure (barg) | 5.3 | | |
| Normal Temperature (°C) | 31.86 | | |
| Set Pressure (barg) | 9 | | |
| LHV (kJ/kg) | 431.6 | - | - |
| Relief Temperature (°C) | 284 | 284 | 238 |
| Required Massflow (kg/hr) | 27770.9 | 8308.9 | 11269.03 |
| Specific Heat Ratio (Cp/Cv) | 1.223 | 1.223 | 1.223 |
| Molecular Weight (kg/kmol) | 37.85 | 31.05 | 31.05 |
| Compressibility Factor | 0.945 | 0.954 | 0.954 |
| Total Back Pressure (barg) | 3.3 | 3.3 | 1.3 |
| Allowable Over Pressure (%) | 21 | 21 | 10 |
| Calculated Discharge Area (mm2) | 3458.068 | 1148 | 1626.34 |
| Required Discharge Area (mm2) | 4358 | 1456 | 1,979.632 |
| Orifice Designation | P | L | L |
| Body Size | 4 x 6 | 3 x 4 | 3 x 4 |
| P&ID Number | BK-GCS-PEDCO-120-PR-PI-0004 (1/2) | | |

## PSV-2113/2114

D02

|  |  |  |  |
| --- | --- | --- | --- |
| Location | V-2105 | | |
| Equipment Size (mm) | (ID X TL-TL) 1500 X 4500 | | |
| Case | Wetted Fire | Gas Expansion | Blocked Outlet |
| Fluid & State | HC | | |
| Operating Pressure (barg) | 5.1 | | |
| Normal Temperature (°C) | 36.92 | | |
| Set Pressure (barg) | 9 | | |
| LHV (kJ/kg) | 1994 | - | - |
| Relief Temperature (°C) | 182.5 | 330.6 | 280 |
| Required Massflow (kg/hr) | 1045.9 | 779.91 | 17833.11 |
| Specific Heat Ratio (Cp/Cv) | 1.246 | 1.246 | 1.246 |
| Molecular Weight (kg/kmol) | 20.06 | 24.524 | 24.523 |
| Compressibility Factor | 0.974 | 0.974 | 0.974 |
| Total Back Pressure (barg) | 3.1 | 3.1 | 2.4 |
| Allowable Over Pressure (%) | 21 | 21 | 10 |
| Calculated Discharge Area (mm2) | 163.208 | 126.67 | 3024.427 |
| Required Discharge Area (mm2) | 205.704 | 159.653 | 3769.279 |
| Orifice Designation | F | F | P |
| Body Size | 1 1/2 x 2 | 1 1/2 x 2 | 4 x 6 |
| P&ID Number | BK-GCS-PEDCO-120-PR-PI-0005 (1/1) | | |

## psv-2121-a/b/c

D02

|  |  |  |  |
| --- | --- | --- | --- |
| Location | V-2101-A/B/C | | |
| Equipment Size (mm) | (ID X TL-TL) 900 X 3000 | | |
| Case | Wetted Fire | Gas Expansion | Blocked Outlet |
| Fluid & State | HC | | |
| Operating Pressure (barg) | 4.9 | | |
| Normal Temperature (°C) | 36.78 | | |
| Set Pressure (barg) | 9 | | |
| LHV (kJ/kg) | 1994 | - | - |
| Relief Temperature (°C) | 182.6 | 350.7 | - |
| Required Massflow (kg/hr) | 342.8 | 268.8 | - |
| Specific Heat Ratio (Cp/Cv) | 1.245 | 1.245 | - |
| Molecular Weight (kg/kmol) | 20.05 | 24.523 | - |
| Compressibility Factor | 0.975 | 0.975 | - |
| Total Back Pressure (barg) | 3.0 | 3.0 | - |
| Allowable Over Pressure (%) | 21 | 21 | - |
| Calculated Discharge Area (mm2) | 53.556 | 44.428 | - |
| Required Discharge Area (mm2) | 120.246 | 99.753 |  |
| Orifice Designation | D | D | - |
| Body Size | 1 x 2 | 1 x 2 | - |
| P&ID Number | BK-GCS-PEDCO-120-PR-PI-0006 (1,2,3/3) | | |

## psv-2122/2123-A/B/C

D02

|  |  |  |  |
| --- | --- | --- | --- |
| Location | C-2101-A/B/C | | |
| Equipment Size (mm) | - | | |
| Case | Wetted Fire | Gas Expansion | Blocked Outlet |
| Fluid & State | HC | | |
| Operating Pressure (barg) | 19 | | |
| Normal Temperature (°C) | 124.8 | | |
| Set Pressure (barg) | 22 | | |
| LHV (kJ/kg) | - | - | - |
| Relief Temperature (°C) | - | - | 204 |
| Required Massflow (kg/hr) | - | - | 8664 |
| Specific Heat Ratio (Cp/Cv) | - | - | 1.225 |
| Molecular Weight (kg/kmol) | - | - | 24.523 |
| Compressibility Factor | - | - | 0.964 |
| Total Back Pressure (barg) | - | - | 1.3 |
| Allowable Over Pressure (%) | - | - | 10 |
| Calculated Discharge Area (mm2) | - | - | 591.135 |
| Required Discharge Area (mm2) |  |  | 719.546 |
| Orifice Designation | - | - | J |
| Body Size | - | - | 2 x 3 |
| P&ID Number | BK-GCS-PEDCO-120-PR-PI-0007 (1,2,3/3) | | |

## psv-2131-a/b/c

D02

|  |  |  |  |
| --- | --- | --- | --- |
| Location | V-2102-A/B/C | | |
| Equipment Size (mm) | (ID X TL-TL) 900 X 3000 | | |
| Case | Wetted Fire | Gas Expansion | Blocked Outlet |
| Fluid & State | HC | | |
| Operating Pressure (barg) | 18.1 | | |
| Normal Temperature (°C) | 60 | | |
| Set Pressure (barg) | 22 | | |
| LHV (kJ/kg) | 1807 | - | - |
| Relief Temperature (°C) | 224 | 208 | - |
| Required Massflow (kg/hr) | 378.37 | 982.27 | - |
| Specific Heat Ratio (Cp/Cv) | 1.278 | 1.278 | - |
| Molecular Weight (kg/kmol) | 19.79 | 24.523 | - |
| Compressibility Factor | 0.936 | 0.936 | - |
| Total Back Pressure (barg) | 3.2 | 3.2 | - |
| Allowable Over Pressure (%) | 21 | 21 | - |
| Calculated Discharge Area (mm2) | 25.979 | 59.62 | - |
| Required Discharge Area (mm2) | 55.669 | 127.757 |  |
| Orifice Designation | D | D | - |
| Body Size | 1 x 2 | 1 x 2 | - |
| P&ID Number | BK-GCS-PEDCO-120-PR-PI-0009 (1,2,3/3) | | |

## psv-2132/2133-a/b/c

D02

|  |  |  |  |
| --- | --- | --- | --- |
| Location | C-2102-A/B/C | | |
| Equipment Size (mm) | - | | |
| Case | Wetted Fire | Gas Expansion | Blocked Outlet |
| Fluid & State | HC | | |
| Operating Pressure (barg) | 54.8 | | |
| Normal Temperature (°C) | 142.3 | | |
| Set Pressure (barg) | 62 | | |
| LHV (kJ/kg) | - | - | - |
| Relief Temperature (°C) | - | - | 233 |
| Required Massflow (kg/hr) | - | - | 8664 |
| Specific Heat Ratio (Cp/Cv) | - | - | 1.278 |
| Molecular Weight (kg/kmol) | - | - | 24.523 |
| Compressibility Factor | - | - | 0.923 |
| Total Back Pressure (barg) | - | - | 1.2 |
| Allowable Over Pressure (%) | - | - | 10 |
| Calculated Discharge Area (mm2) | - | - | 213.771 |
| Required Discharge Area (mm2) | - | - | 260.208 |
| Orifice Designation | - | - | G |
| Body Size | - | - | 1 1/2 x 3 |
| P&ID Number | BK-GCS-PEDCO-120-PR-PI-0010 (1,2,3/3) | | |

## psv-2141/2142

D02

|  |  |  |  |
| --- | --- | --- | --- |
| Location | V-2103 | | |
| Equipment Size (mm) | (ID X TL-TL) 900 X 3000 | | |
| Case | Wetted Fire | Gas Expansion | Blocked Outlet |
| Fluid & State | HC | | |
| Operating Pressure (barg) | 53.9 | | |
| Normal Temperature (°C) | 60 | | |
| Set Pressure (barg) | 62 | | |
| LHV (kJ/kg) | 1456 | - | - |
| Relief Temperature (°C) | 286 | 188 | 139 |
| Required Massflow (kg/hr) | 17763.11 | 17736.11 | 17252.5 |
| Specific Heat Ratio (Cp/Cv) | 1.461 | 1.461 | 1.461 |
| Molecular Weight (kg/kmol) | 18.96 | 24.56 | 24.562 |
| Compressibility Factor | 0.823 | 0.823 | 0.823 |
| Total Back Pressure (barg) | 2.1 | 2.1 | 1.9 |
| Allowable Over Pressure (%) | 21 | 21 | 10 |
| Calculated Discharge Area (mm2) | 430 | 343.035 | 346.002 |
| Required Discharge Area (mm2) | 523.298 | 417.552 | 421.163 |
| Orifice Designation | H | H | H |
| Body Size | 2 x 3 | 2 x 3 | 2 x 3 |
| P&ID Number | BK-GCS-PEDCO-120-PR-PI-0012 (1/1) | | |

## psv-2201

D02

|  |  |  |  |
| --- | --- | --- | --- |
| Location | V-2203 | | |
| Equipment Size (mm) | (ID X TL-TL) 1500 X 5000 | | |
| Case | Wetted Fire | Gas Expansion | Blocked Outlet |
| Fluid & State | Air | | |
| Operating Pressure (barg) | 8 | | |
| Normal Temperature (°C) | 65 | | |
| Set Pressure (barg) | 12.5 | | |
| LHV (kJ/kg) | 1949 | - | - |
| Relief Temperature (°C) | 201.7 | 323.4 | - |
| Required Massflow (kg/hr) | 338.521 | 1071.801 | - |
| Specific Heat Ratio (Cp/Cv) | 1.416 | 1.416 | - |
| Molecular Weight (kg/kmol) | 18.2 | 28.95 | - |
| Compressibility Factor | 0.990 | 0.990 | - |
| Total Back Pressure (barg) | 0.5 | 0.5 | - |
| Allowable Over Pressure (%) | 21 | 21 | - |
| Calculated Discharge Area (mm2) | 40.24 | 113.24 | - |
| Required Discharge Area (mm2) | 86.24 | 137.85 |  |
| Orifice Designation | D | E | - |
| Body Size | 1 x 2 | 1 x 2 | - |
| P&ID Number | BK-GCS-PEDCO-120-PR-PI-0015 (2/2) | | |

## psv-2211-a/b

D02

|  |  |  |  |
| --- | --- | --- | --- |
| Location | V-2204 | | |
| Equipment Size (mm) | (ID X TL-TL) 1050 X 3150 | | |
| Case | Wetted Fire | Gas Expansion | Blocked Outlet |
| Fluid & State | Nitrogen | | |
| Operating Pressure (barg) | 8 | | |
| Normal Temperature (°C) | 60 | | |
| Set Pressure (barg) | 12.5 | | |
| LHV (kJ/kg) | 1950 | - | - |
| Relief Temperature (°C) | 195.9 | 323.4 | - |
| Required Massflow (kg/hr) | 408.2 | 500.391 | - |
| Specific Heat Ratio (Cp/Cv) | 1.245 | 1.4 | - |
| Molecular Weight (kg/kmol) | 19.22 | 28 | - |
| Compressibility Factor | 1.0 | 1 | - |
| Total Back Pressure (barg) | 0.5 | 0.5 | - |
| Allowable Over Pressure (%) | 21 | 21 | - |
| Calculated Discharge Area (mm2) | 47.363 | 54.241 | - |
| Required Discharge Area (mm2) | 101.492 | 116.23 | - |
| Orifice Designation | D | D | - |
| Body Size | 1 x 2 | 1 x 2 | - |
| P&ID Number | BK-GCS-PEDCO-120-PR-PI-0016 (1/1) | | |

## psv-2271-a/b

D02

|  |  |  |  |
| --- | --- | --- | --- |
| Location | V-2205 | | |
| Equipment Size (mm) | (ID X TL-TL) 438 X 2950 | | |
| Case | Wetted Fire | Gas Expansion | Blocked Outlet |
| Fluid & State | HC | | |
| Operating Pressure (barg) | 4.9 | | |
| Normal Temperature (°C) | 36.78 | | |
| Set Pressure (barg) | 9 | | |
| LHV (kJ/kg) | 1994 | - | - |
| Relief Temperature (°C) | 182.6 | 350.7 | - |
| Required Massflow (kg/hr) | 174.5 | 114.131 | - |
| Specific Heat Ratio (Cp/Cv) | 1.245 | 1.245 | - |
| Molecular Weight (kg/kmol) | 20.05 | 24.523 | - |
| Compressibility Factor | 0.975 | 0.975 | - |
| Total Back Pressure (barg) | 3.2 | 3.2 | - |
| Allowable Over Pressure (%) | 21 | 21 | - |
| Calculated Discharge Area (mm2) | 27.258 | 18.858 | - |
| Required Discharge Area (mm2) | 61.787 | 42.747 | - |
| Orifice Designation | D | D | - |
| Body Size | 1 x 2 | 1 x 2 | - |
| P&ID Number | BK-GCS-PEDCO-120-PR-PI-0022 (1/1) | | |

## psv-2293

D02

|  |  |  |  |
| --- | --- | --- | --- |
| Location | V-2107 | | |
| Equipment Size (mm) | (ID X TL-TL) 1100 X 3600 | | |
| Case | Wetted Fire | Gas Expansion | Blocked Outlet |
| Fluid & State | TEG | | |
| Operating Pressure (barg) | 0.1 | | |
| Normal Temperature (°C) | Amb. | | |
| Set Pressure (barg) | 3.5 | | |
| LHV (kJ/kg) | 314.3 | - | - |
| Relief Temperature (°C) | 335.9 | 335.9 | - |
| Required Massflow (kg/hr) | 2098.01 | 76.59 | - |
| Specific Heat Ratio (Cp/Cv) | 1.083 | 1.083 | - |
| Molecular Weight (kg/kmol) | 88.11 | 88.11 | - |
| Compressibility Factor | 0.646 | 0.646 | - |
| Total Back Pressure (barg) | 0.1 | 0.1 | - |
| Allowable Over Pressure (%) | 21 | 21 | - |
| Calculated Discharge Area (mm2) | 350.982 | 12.804 | - |
| Required Discharge Area (mm2) | 427.226 | 27.438 |  |
| Orifice Designation | H | D | - |
| Body Size | 1 1/2 x 3 | 1 x 2 | - |
| P&ID Number | BK-GCS-PEDCO-120-PR-PI-0025 (1/1) | | |