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| **طرح نگهداشت و افزایش تولید 27 مخزن** |
| **CALCULATION NOTE FOR FLOW ELEMENT SIZING** **نگهداشت و افزایش تولید میدان نفتی بینک** |
|  |  |  |  |  |  |  |
| D03 | NOV.2023 | IFA | M.Aryafar | M.Fakharian | S.Faramarzpour |  |
| D02 | JUN.2023 | IFA | M.Aryafar | M.Fakharian | M.Mehrshad |  |
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| D00 | JUN.2022 | 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-708741** |
| **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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1. **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 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 purpose of this document is to provide report for sizing of all orifices used in the BINAK Gas compressor station.

1. **NORMATIVE REFERENCES**

## Local Codes and Standards

* IPS-E-IN-130 Engineering Standard for flow instruments.

## International Codes and Standards

* AS 2360.1.1/ISO 5167-1 Measurement of fluid flow in closed conduits.

## The Project Documents

* BK-GNRAL-PEDCO-000-PR-DB-0001 Process Basis of Design
* BK-GNRAL-PEDCO-000-PR-DC-0001 Process Design Criteria
* BK-GCS-PEDCO-120-PR-PF-0001 Process Flow Diagram (PFD)

## ENVIRONMENTAL DATA

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

1. **software**

D03

The software using for sizing flow elements is CONVAL (version 11) and Hysys version 11).

1. **Diameter of orifice**

The diameter ratio β= d/D is always greater than or equal to 0.15 and less than or equal to 0.70. (Base on IPS-E-IN-130).

1. **ORIFICE SIZEs**

Below is a table that contains the sizing details for the orifices to be installed in BINAK Gas compressor station.

D03

| **Item** | **Tag No.** | **Line No.** | **P&ID No.** | **Phase** | **Max. Flowrate****(kg/hr)** | **Inlet Temp.****(°C)** | **Inlet Pre.****(barg)** | **Outlet Pre.****(barg)** | **Beta Ratio** | **Orifice Dia.****(mm)** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | RO-2112  | GAS-111-0225-AN07-3”-PT | BK-GCS-PEDCO-120-PR-PI-0005-1/1 | Gas | 5665.4 | 36.87 | 9 | 4.5 | 0.467 | 34.6(Note 1) |
| 2 | RO-2134A/B/C | GAS-111-0160A/B/C-CN05-2”-PT | BK-GCS-PEDCO-120-PR-PI-0009-1,2,3/3 | Gas | 778.4 | 60 | 22 | 7 | 0.172 | 8.5(Note 1) |
| 3 | RO-2131A/B/C | CDH-112-0023A/B/C-CS00-2”-NP | BK-GCS-PEDCO-120-PR-PI-0009-1,2,3/3 | Liquid | 10000 | 59.88 | 18.1 | 0.2 | 0.158 | 8.674(Note 1) |
| 4 | RO-2133A/B/C | GAS-111-0054A/B/C-FS00-1 1/2”-NP | BK-GCS-PEDCO-120-PR-PI-0011-1,2,3/3 | Gas | 1333 | 60 | 62 | 7 | 0.185 | 6.32(Note 1) |
| 5 | RO-2141 | GAS-111-0065-FN05-1 1/2”-PT | BK-GCS-PEDCO-120-PR-PI-0012-1/1 | Gas | 1722 | 60 | 62 | 7 | 0.211 | 7.18(Note 1) |
| 6 | RO-2144 | CDH-112-0025-FS00-2”-NP | BK-GCS-PEDCO-120-PR-PI-0012-1/1 | Liquid | 11500 | 58.89 | 53.9 | 0.2 | 0.134 | 7.081(Note 1) |
| 7 | RO-2151 | GAS-111-0071-FN05-3”-PT | BK-GCS-PEDCO-120-PR-PI-0013-1/3 | Gas | 4578 | 60 | 62 | 7 | 0.158 | 11.7(Note 1) |
| 8 | RO-2162 | TEG-111-0002-AN04-2"-PT | BK-GCS-PEDCO-120-PR-PI-0014-1/1 | Liquid | 5500 | 33 | 1 | 0.01 | 0.230 | 12.09(Note 1) |
| 9 | FE-2101 | GAS-111-0001-AN07-6”-PT | BK-GCS-PEDCO-120-PR-PI-0002-1/1 | Gas | 7220.4 | 46.11 | 6.75 | 6.5 | 0.460 | 67.387(Note 1) |
| 10 | FE-2102 | GAS-111-0001-FN07-8”-PT | BK-GCS-PEDCO-120-PR-PI-0003-1/1 | Gas | 12395.9 | 32 | 6.75 | 6.5 | 0.454 | 90.101(Note 1) |
| 11 | FE-2111 | CDH-112-0014-CN05-4”-PT | BK-GCS-PEDCO-120-PR-PI-0004-2/2 | Liquid | 7873.8 | 23.22 | 19.75 | 19.5 | 0.281 | 21.863(Note 1) |
| 12 | FE-2121A/B/C | GAS-111-0031A/B/C-AN05-8”-ET | BK-GCS-PEDCO-120-PR-PI-0007-1,2,3/3 | Gas | 8923.9 | 36.78 | 4.9 | 4.775 | 0.462 | 95.436(Note 2) |
| 13 | FE-2131A/B/C | GAS-111-0044A/B/C-CN05-6”-ET | BK-GCS-PEDCO-120-PR-PI-0010-1,2,3/3 | Gas | 8923.9 | 59.88 | 18.1 | 17.975 | 0.464 | 71.504(Note 2) |
| 14 | FE-2211 | NIT-112-0021-AN01-2”-PT | BK-GCS-PEDCO-120-PR-PI-0016-1/1 | Gas | 42.49 | 60 | 7.5 | 7.25 | 0.103 | 5.424(Note 1) |
| 15 | FE-2271 | FLG-112-0110-AN07-4"-PT | BK-GCS-PEDCO-120-PR-PI-0022-1/1 | Gas | 556.38 | 36.78 | 4.9 | 4.65 | 0.221 | 21.491(Note 1) |

D03

NOTES:

D02

D03

1. All the calculated orifice diameter will be finalized by vendor.
2. Orifice diameter will be finalized by compressor supplier.
3. Deleted.
4. **attachment**

Please check the attachment.