



نگهداشت و افزایش تولید میدان نفتی بینک
سطح الارض

احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک



شماره پیمان:

053 - 073 - 9184

CALCULATION NOTE FOR FLOW ELEMENT SIZING

| پروژه | بسته کاری | صادرکننده | تسهیلات | رشته | نوع مدرک | سریال | نسخه |
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| BK | GCS | PEDCO | 120 | PR | CN | 0003 | D02 |

شماره صفحه: 1 از 8

طرح نگهداشت و افزایش تولید 27 مخزن

CALCULATION NOTE FOR FLOW ELEMENT SIZING

نگهداشت و افزایش تولید میدان نفتی بینک

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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

The purpose of this document is to provide report for sizing of all orifices used in the BINAK Gas compressor station.

3.0 NORMATIVE REFERENCES

3.1 LOCAL CODES AND STANDARDS

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

3.2 INTERNATIONAL CODES AND STANDARDS

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

3.3 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)

3.4 ENVIRONMENTAL DATA

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



4.0 SOFTWARE

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

5.0 DIAMETER OF ORIFICE

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



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6.0 ORIFICE SIZES

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

| 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 | 0.397 | 29.258 (Note 1) |
| 2 | RO-2134 A/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 | 0.139 | 6.855 (Note 1) |
| 3 | RO-2131 A/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-2133 A/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 | 0.119 | 4.9 (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 | 0.163 | 5.57 (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 | 0.123 | 9.068 (Note 1) |

D02



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شماره پیمان:

053 - 073 - 9184



CALCULATION NOTE FOR FLOW ELEMENT SIZING

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| نسخه | سریال | نوع مدرک | رشته | تسهیلات | صادر کننده | بسته کاری | پروژه |
| D02 | 0003 | CN | PR | 120 | PEDCO | GCS | BK |

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| 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) |
|------|---------------|------------------------------|-------------------------------------|--------|-----------------------|------------------|-------------------|--------------------|---------------|-------------------|
| 8 | RO-2162 | TEG-111-0002-AN04-2"-PT | BK-GCS-PEDCO-120-PR-PI-0014-1/1 | Liquid | 6132.5 | 33 | 2 | HOLD (Note 3) | HOLD (Note 3) | HOLD (Note 1,3) |
| 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 | 19.5 | 19.25 | 0.216 | 22.133 (Note 1) |
| 12 | FE-2121 A/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-2131 A/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 | 53.78 | 60 | 8 | 7.75 | 0.101 | 5.346 (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) |

D02

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NOTES:

- 1- All the calculated orifice diameter will be finalized by vendor.
- 2- Orifice diameter will be finalized by compressor supplier.
- 3- HOLD sections shall be finalized after receiving Dehydration Package supplier data.

7.0 ATTACHMENT

Please check the attachment.