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| **طرح نگهداشت و افزایش تولید 27 مخزن** |
| **CALCULATION NOTE FOR FLOW ELEMENT SIZING** **نگهداشت و افزایش تولید میدان نفتی بینک** |
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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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| **PAGE** | **D00** | **D01** | **D02** | **D03** | **D04** |  | **PAGE** | **D00** | **D01** | **D02** | **D03** | **D04** |
| **1** | X |  |  |  |  | **66** |  |  |  |  |  |
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| **15** |  |  |  |  |  | **80** |  |  |  |  |  |
| **16** |  |  |  |  |  | **81** |  |  |  |  |  |
| **17** |  |  |  |  |  | **82** |  |  |  |  |  |
| **18** |  |  |  |  |  | **83** |  |  |  |  |  |
| **19** |  |  |  |  |  | **84** |  |  |  |  |  |
| **20** |  |  |  |  |  | **85** |  |  |  |  |  |
| **21** |  |  |  |  |  | **86** |  |  |  |  |  |
| **22** |  |  |  |  |  | **87** |  |  |  |  |  |
| **23** |  |  |  |  |  | **88** |  |  |  |  |  |
| **24** |  |  |  |  |  | **89** |  |  |  |  |  |
| **25** |  |  |  |  |  | **90** |  |  |  |  |  |
| **26** |  |  |  |  |  | **91** |  |  |  |  |  |
| **27** |  |  |  |  |  | **92** |  |  |  |  |  |
| **28** |  |  |  |  |  | **93** |  |  |  |  |  |
| **29** |  |  |  |  |  | **94** |  |  |  |  |  |
| **30** |  |  |  |  |  | **95** |  |  |  |  |  |
| **31** |  |  |  |  |  | **96** |  |  |  |  |  |
| **32** |  |  |  |  |  | **97** |  |  |  |  |  |
| **33** |  |  |  |  |  | **98** |  |  |  |  |  |
| **34** |  |  |  |  |  | **99** |  |  |  |  |  |
| **35** |  |  |  |  |  | **100** |  |  |  |  |  |
| **36** |  |  |  |  |  | **101** |  |  |  |  |  |
| **37** |  |  |  |  |  | **102** |  |  |  |  |  |
| **38** |  |  |  |  |  | **103** |  |  |  |  |  |
| **39** |  |  |  |  |  | **104** |  |  |  |  |  |
| **40** |  |  |  |  |  | **105** |  |  |  |  |  |
| **41** |  |  |  |  |  | **106** |  |  |  |  |  |
| **42** |  |  |  |  |  | **107** |  |  |  |  |  |
| **43** |  |  |  |  |  | **108** |  |  |  |  |  |
| **44** |  |  |  |  |  | **109** |  |  |  |  |  |
| **45** |  |  |  |  |  | **110** |  |  |  |  |  |
| **46** |  |  |  |  |  | **111** |  |  |  |  |  |
| **47** |  |  |  |  |  | **112** |  |  |  |  |  |
| **48** |  |  |  |  |  | **113** |  |  |  |  |  |
| **49** |  |  |  |  |  | **114** |  |  |  |  |  |
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| **54** |  |  |  |  |  | **119** |  |  |  |  |  |
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| **56** |  |  |  |  |  | **121** |  |  |  |  |  |
| **57** |  |  |  |  |  | **122** |  |  |  |  |  |
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| **61** |  |  |  |  |  | **126** |  |  |  |  |  |
| **62** |  |  |  |  |  | **127** |  |  |  |  |  |
| **63** |  |  |  |  |  | **128** |  |  |  |  |  |
| **64** |  |  |  |  |  | **129** |  |  |  |  |  |
| **65** |  |  |  |  |  | **130** |  |  |  |  |  |

**CONTENTS**

[1.0 INTRODUCTION 4](#_Toc105841487)

[2.0 Scope 4](#_Toc105841488)

[3.0 NORMATIVE REFERENCES 5](#_Toc105841489)

[3.1 Local Codes and Standards 5](#_Toc105841490)

[3.2 International Codes and Standards 5](#_Toc105841491)

[3.3 The Project Documents 5](#_Toc105841492)

[3.4 ENVIRONMENTAL DATA 5](#_Toc105841493)

[4.0 software 5](#_Toc105841494)

[5.0 Diameter of orifice 5](#_Toc105841495)

[6.0 ORIFICE SIZEs 5](#_Toc105841496)

[7.0 attachment 11](#_Toc105841497)

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**

The software using for sizing flow elements is InstruCalc (version 9.0.0).

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.

| **Item** | **tag** | **Line Number** | **Reference Document** | **Phase** | **Max****Flow****Rate(kg/h)** | **Inlet T****(° C)** | **Inlet P(brag)** | **Outlet P(brag)** | **Beta Ratio** | **Orifice Diameter (mm)** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | RO-2112 | GAS-111-0025-AN07-10”-PT | BK-GCS-PEDCO-120-PR-PI-0005 | GAS | 250.7 | 36.92 | 9 | 4.5 | 0.1420 | 7.2137 |
| 2 | RO-2131 A/B/C | CDH-111-0023A,B,C-CS00-2”-NP | BK-GCS-PEDCO-120-PR-PI-0009(1,2,3) | LIQUID | 600 | 59.88 | 18.1 | 0 | 0.03862 | 1.9620 |
| 3 | RO-2134A/B/C | FL-112-0119A,B,C-AN07-3”-PT | BK-GCS-PEDCO-120-PR-PI-0009(1,2,3) | GAS | 778.4 | 60 | 22 | 7 | 0.168 | 8.543 |
| 4 | RO-2133 A/B/C | FL-112-0023A-AN07-2''-PT A,B,C-FS00-2”-NP | BK-GCS-PEDCO-120-PR-PI-0011(1,2,3) | GAS | 1333.8 | 60 | 62 | 7 | 0.132 | 6.740 |
| 5 | RO-2141 | FL-112-0001-AN07-3"-PT | BK-GCS-PEDCO-120-PR-PI-0012 | GAS | 1722 | 60 | 62 | 7 | 0.150 | 7.652 |
| 6 | RO-2144 | CDH-112-0026-AN07-2"-PT | BK-GCS-PEDCO-120-PR-PI-0012 | LIQUID | 600 | 60 | 53.9 | 0 | 0.03659 | 1.8590 |
| 7 | RO-2151 | FL-112-0002-AN07-4"-PT | BK-GCS-PEDCO-120-PR-PI-0013(1) | GAS | 3236 | 60 | 62 | 7 | 0.1032 | 10.48 |
| **Item** | **tag** | **Line Number** | **Reference Document** | **Phase** | **Maximum****Flow****Rate(kg/h)** | **Inlet T****(° C)** | **Inlet P(brag)** | **Δ P****@****Normal****Flow****Rate****mbar** | **Beta Ratio** | **Orifice Diameter (mm)** |
| 8 | FE-2101 | GAS-111-0101-AN07-6”-PT | BK-GCS-PEDCO-120-PR-PI-0002 | GAS | 7220.493 | 46.11 | 5.5 | 250 | 0.55 | 83.99 |
| 9 | FE-2102 | GAS-111-0012-AN07-8”-PT | BK-GCS-PEDCO-120-PR-PI-0003 | GAS | 12395.93 | 32 | 5.5 | 250 | 0.55 | 112.02 |
| 10 | FE-2111 | CDH-112-0014-CN05-3”-PT | BK-GCS-PEDCO-120-PR-PI-0004(2) | LIQUID | 7873.8 | 20.6 | 19.67 | 250 | 0.363 | 27.700 |
| 11 | FE-2121 A/B/C | GAS-111-0031A,B,C-AN05-8”-ET | BK-GCS-PEDCO-120-PR-PI-0007(1,2,3) | GAS | 8924 | 36.78 | 4.9 | 250 | 0.482 | 98.06 |
| 12 | FE-2131 A/B/C | GAS-111-0044A,B,C-CN05-6”-ET | BK-GCS-PEDCO-120-PR-PI-0010(1,2,3) | GAS | 8924 | 59.88 | 18.1 | 250 | 0.4813 | 73.35 |
| 13 | FE-2211 | NIT-112-0021-AN01-2”-PT | BK-GCS-PEDCO-120-PR-PI-0016 | GAS | 53.78 | 60 | 8 | 250 | 0.209 | 10.65 |
| 14 | FE-2271 | FLG-112-0010-AN07-2”-PT | BK-GCS-PEDCO-120-PR-PI-0022 | GAS | 556.38 | 36.78 | 4.9 | 250 | 0.481 | 24.45 |

1. **attachment**