

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک							 شرکت توسعه ترابریان  HIRGAN ENERGY 
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طرح نگهداشت و افزایش تولید 27 مخزن

PROCESS SIMULATION REPORT

نگهداشت و افزایش تولید میدان نفتی بینک

D04	Aug. 2022	IFA	M.Aryafar	M.Fakharian	M.Mehrshad	
D03	MAR. 2022	IFA	M.Aryafar	M.Fakharian	M.Mehrshad	
D02	JAN. 2022	IFA	M.Aryafar	M.Fakharian	M.Mehrshad	
D01	NOV. 2021	IFA	M.Aryafar	M.Fakharian	M.Mehrshad	
D00	OCT. 2021	IFC	M.Aryafar	M.Fakharian	Sh.Ghalikar	
Rev.	Date	Purpose of Issue/Status	Prepared by:	Checked by:	Approved by:	CLIENT Approval

Class:2

CLIENT Doc. Number: 'F0Z-708817

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 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 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.

2.0 SCOPE

The purpose of this document is to present design data and assumptions used to perform

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process simulations and results of simulation for different operating cases, namely summer and winter cases in normal operating capacities of the BINAK New Gas Compressor.

3.0 NORMATIVE REFERENCES

3.1 CODES AND STANDARDS

The process design of the gas compression station shall comply with the latest versions of the international codes and standards from the following bodies (where applicable):

IPS	Iranian Petroleum Standards
API	American Petroleum Institute
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ISA	Instrument Society of America
ISO	International Standards Organisation
NACE	National Association of Corrosion Engineers
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Act
TEMA	Tubular Exchangers Manufacturer's Association

3.2 THE PROJECT DOCUMENTS

- BK-GNRAL-PEDCO-000-PR-DB-0001 Process Basis of Design
- BK-GNRAL-PEDCO-000-PR-DC-0001 Process Design Criteria

3.3 ENVIRONMENTAL DATA

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

4.0 FEED GAS SPECIFICATION

Table No.1 indicates feed composition, temperature, pressure and available flow for use in design of compressor station based on "Process Basis of Design; Doc. No. BK-GNRAL-PEDCO-000-PR-DB-0001".

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Table No.1: Binak Compressor Station Feed Composition (Saturated with Water)

Components	GOLKHARI		Binak	
	(Mol. %) in Summer	(Mol. %) in Winter	(Mol. %) in Summer	(Mol. %) in Winter
H ₂ O	0.743	0.274	1.584	0.543
CO ₂	3.008	2.962	3.454	1.672
H ₂ S	6.770	6.184	2.805	1.867
Methane	67.253	71.690	57.439	78.373
Ethane	11.862	11.200	17.378	11.855
Propane	6.264	5.007	10.549	4.219
i-Butane	0.615	0.429	1.269	0.328
n-Butane	1.300	0.868	2.932	0.708
i-Pentane	0.665	0.399	0.758	0.129
n-Pentane	0.318	0.180	0.492	0.079
n-Hexane	0.576	0.289	0.807	0.094
n-Heptane	0.149	0.070	0.285	0.024
n-Octane	0.050	0.020	0.079	0.005
n-Nonane	0.030	0.010	0.030	0.002
n-Decane	0.010	0.000	0.010	0.000
Nitrogen	0.387	0.419	0.128	0.000
Total	100	100	100	100
Feed Pressure, Barg	5.5	5.5	5.5	5.5
Feed Temperature, °C	32.00	15.5	46.11	26.67

5.0 DESIGN ASSUMPTIONS

Following assumptions have been used to perform the current study:

- Capacity : 15.00 MMSCFD
- Compressor type: reciprocating (Other information will be completed by vendor).
- Main Equipment: Slug Catcher, Inlet Knock Out Drum , Suction Drum , Reciprocating Compressors, Air Gas Coolers, Gas Compression Discharge Drum, Dehydration Package
- No. Of Duty / Stand By Gas Compressor Trains: 2+1

Design:

- Station outlet gas temperature: ~ 60 °C
- Compressor station outlet gas pressure: 49.56 / 58.27 Barg
- Compressor polytropic efficiency: 85%

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Pressure drop:

- Air Cooler: 0.7 Bar
- Inlet Slug Catcher and Intermediate pressure vessel: 0.2 Bar (including DP for piping)Bar
- Dehydration Package: 1 Bar
- Pressure drop from outlet control valve of gas compressor to siahmakan pipeline: 1.98 ~ 3.34 Bar

6.0 SIMULATION SOFTWARE

ASPEN HYSYS V 11 simulator has been used to simulate the Binak compressor station.

6.1 THERMO-PHYSICAL PROPERTIES PREDICTION METHODS

Fluid package which is used in the simulation software shall cover a wide range of pressure and temperature parameters since the fluid pressure and temperature are changed during moving through processing facilities.

Since Peng Robinson equation of state enables to obtain accurate results for a variety of systems over a wide range of conditions, therefore it has been selected as fluid package with ASPEN HYSYS simulation software.

Glycol fluid package is considered for simulation of Dehydration packages

Note: Simulation of Dehydration package shall be finalized by their related vendor.

7.0 SIMULATION RESULT

Following Simulations are reported in winter and summer cases.

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ATTACHMENT I: HYSYS REPORT SUMMER CASE

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ATTACHMENT 2: HYSYS REPORT WINTER CASE