

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک								
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	BK	GCS	PEDCO	120	PR	LI	0005	D01	

طرح نگهداشت و افزایش تولید 27 مخزن

CHEMICAL CONSUMPTION LIST

نگهداشت و افزایش تولید میدان نفتی بینک

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D00	MAR.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-708811

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

This document defines process design basis for Binak Compressor Station to process sour gas from Golkhari booster/cluster and Binak production unit with cumulative rate of 15 MMSCFD. The new compressors will be added "future" section of existing Binak compressor station plant.

3.0 NORMATIVE REFERENCES

3.1 CODES AND STANDARDS

Not Applicable.

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
- BK-PPL-PEDCO-320-PR-PI-0001 P&ID - Gas Pipeline (to Siahmakan G.I. Station)
- BK-GCS-PEDCO-120-PR-PF-0001 Process Flow Diagram (PFD)
- BK-GCS-PEDCO-120-PR-UF-0001 Utility Flow Diagrams (UFD)
- BK-GCS-PEDCO-120-PR-PI-0002~0025 P&IDs

3.3 ENVIRONMENTAL DATA

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

3.4 ORDER OF PRECEDENCE

In case of any conflict between the contents of this document or any discrepancy between this document and other project documents or reference standards, this issue must be reported to the CLIENT. The final decision in this situation will be made by CLIENT.

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4.0 CHEMICAL CONSUMPTION LIST

4.1 CORROSION INHIBITOR

Refer to Process Flow Diagram and Utility Flow Diagram corrosion inhibitor injection is required for gas pipelines to manage corrosion due to H₂S and CO₂ in presence of water. Reported gas composition in the process flow diagram should be delivered to Vendors (chemical supplier) to determine required injection rate.

The corrosion inhibitor injection package has been considered as part of design where its design, including injection rate, should be finalized after clarification with chemical supplier.

Table 1 - Corrosion Inhibitor Consumption



Injection Point	Flowrate (lit/hr)			Operating pressure(barg)	Continuous / Intermittent	Notes
	Min.	Max.	Rated			
Gas Pipeline Pig Launcher (PL-3201)	0.280	0.283	0.340	52.9	Continuous	1,2,4
Gas Discharge Drum Outlet (V-2103)	0.282	0.284	0.341	53.9	Continuous	1,2,4
Gas Pig Receiver Outlet (PR-1002)	0.098	0.098	0.117	7.5	Continuous	1,3,4
Gas Pig Receiver Outlet (PR-2102)	0.188	0.188	0.225	7.5	Continuous	1,3,4
Fuel Gas K.O. Drum (V-2205)	0.00013	0.00014	0.0002	4.9	Continuous	1,3,4
Inlet K.O. Drum Outlet (V-2105)	0.285	0.285	0.342	5.1	Continuous	1,3,4

Notes:

- 1) Gas corrosion inhibitor injection rates are considered as 1 Pint/MMSCF (each pint equals to 0.47 liter) for gas compressor station lines with assumption of making 70% (fuel oil) - 30% (corrosion inhibitor) solution (will be finalized by chemical Vendor).

2) Assumption High Pressure Injection:

The Maximum consumption of Gas Corrosion inhibitor has been considered as injection to outlet of Gas Discharge Drum (V-2103) and injection to Gas Pipeline Pig Launcher (PL-3201).

V-2103: 14.51 MMSCFD

PL-3201: 14.45 MMSCFD

Total: 14.51+14.45=28.96 MMSCFD & $((0.47*28.96)/24)/0.3=1.89$ lit/hr

The Minimum consumption of Gas Corrosion inhibitor has been considered as injection to outlet of Gas Discharge Drum (V-2103) and injection to Gas Pipeline Pig Launcher (PL-3201).

V-2103: 14.39 MMSCFD

PL-3201: 14.31 MMSCFD

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Total: 14.39+14.31=28.70 MMSCFD & $((0.47 \times 28.70) / 24) / 0.3 = 1.87 \text{ lit/hr}$

3) Assumption Low Pressure Injection:

The maximum consumption of Gas Corrosion inhibitor has been considered as injection to outlet of Gas Pig Receiver (PR-1002), injection to outlet of Gas Pig Receiver (PR-2102), injection to Fuel Gas K.O. Drum (V-2205) and injection to inlet of K.O. Drum Outlet (V-2105).

PR-1002: 4.99 MMSCFD

PR-2102: 9.58 MMSCFD

V-2205: 0.006 MMSCFD

V-2105: 14.57 MMSCFD

Total: 4.99+9.58+0.006+14.57=29.15 MMSCFD & $((0.47 \times 29.15) / 24) / 0.3 = 1.9 \text{ lit/hr}$

The minimum consumption of Gas Corrosion inhibitor has been considered as injection to outlet of Gas Pig Receiver (PR-1002), injection to outlet of Gas Pig Receiver (PR-2102), injection to Fuel Gas K.O. Drum (V-2205) and injection to inlet of K.O. Drum Outlet (V-2105).

PR-1002: 4.99 MMSCFD

PR-2102: 9.58 MMSCFD

V-2205: 0.01 MMSCFD

V-2105: 14.57 MMSCFD

Total: 4.99+9.58+0.01+14.57=29.15 MMSCFD & $((0.47 \times 29.15) / 24) / 0.3 = 1.9 \text{ lit/hr}$

4) Laboratory evaluation of corrosion inhibitor, based on NACE PUBLICATION 31215, NACE 1D196 and ASTM G170 standards shall be approved by employer-approved laboratories.

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4.2 METHANOL INJECTION

Refer to Process Flow Diagram and Utility Flow Diagram methanol injection is required for gas pipelines to prevent formation of hydration. Reported gas composition in the PFD should be delivered to Vendors (chemical supplier) to determine required injection rate.

The methanol injection package has been considered as part of design where its design, including injection rate, should be finalized after clarification with chemical supplier.

Table 2 - Methanol Injection Consumption



Injection Point	Flowrate (lit/hr)			Continuous / Intermittent	Notes
	Min.	Max.	Rated		
Gas Discharge Drum Outlet (V-2102A/B/C)	12.632	-	15.159	Intermittent	-
Gas Discharge 2nd Stage Gas Compression Air Cooler (AE-2102A/B/C)	35.834	-	43.0	Intermittent	2
Gas Discharge Drum Outlet (V-2103)	44.433	-	53.319	Intermittent	3
Dehydration Package Outlet (PK-2101)	50.208	-	60.249	Intermittent	4
Gas Pipeline	12.528	-	15.033	Intermittent	5

Notes:



1) Assumption:

The Maximum consumption of low pressure Methanol has been considered for the BDV-2131 A/B/C of Composite Gas Discharge 2nd Stage Gas Compression Suction DRUM (V-2102A/B/C)
Maximum consumption for (BDV-2131A/B/C) = 5.819 kg/h
Mass density of Methanol = 767.8 kg/m³
 $((5.819 * 1000) / 767.8) = 7.579$ lit/hr
Total: 7.58 lit/hr * 2 = 15.159



2) Assumption:

The Maximum consumption of high pressure Methanol has been considered for the BDV-2132 A/B/C of Composite Gas Discharge 2nd Stage Gas Compression Air Cooler (AE-2102A/B/C)
Maximum consumption for (BDV-2132A/B/C) = 16.508 kg/h
Mass density of Methanol = 767.8 kg/m³
 $((16.508 * 1000) / 767.8) = 21.5$ lit/hr
Total: 21.5 lit/hr * 2 = 43.0



3) Assumption:

The Maximum consumption of high pressure Methanol has been considered for the BDV-2141 of

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Composite Gas Discharge Drum Outlet (V-2103)
Maximum consumption for (BDV-2141) = 40.938 kg/h
Mass density of Methanol = 767.8 kg/m³
 $((40.938 * 1000) / 767.8) = 53.319$ lit/hr
Total: 53.319 lit/hr



4) Assumption:

The Maximum consumption of high pressure Methanol has been considered for the BDV-2151 of Composite Gas Dehydration Package Outlet (PK-2101)
Maximum consumption for (BDV-2151) = 46.259 kg/h
Mass density of Methanol = 767.8 kg/m³
 $((46.259 * 1000) / 767.8) = 60.249$ lit/hr
Total: 60.249 lit/hr



5) Methanol consumption calculation for injection to 8" pipeline have been study based on pipeline hydrate formation study.

Methanol will be injected between 9.618 ~11.542 kg/hr. (Max flow when (PK-2101) is not in service, Max flow when destination pressure is 40 barg and (PK-2101) is not in service.
Maximum $((11.542 * 1000) / 767.8) = 15.033$ lit/hr
Minimum $(9.618 * 1000) / 767.8 = 12.528$ lit/hr

Note: Considering that the maximum amount of methanol consumption is 60.249 Lit/hr , while the existing pump (X-4704P-1A) is working with capacity of 101 Lit/hr, this amount is acceptable.