طرح نگهداشت و افزایش تولید 27 مخزن

DUTY SPECIFICATION FOR GAS DEHYDRATION PACKAGE (PK-2101)

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
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REVISION RECORD SHEET

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CONTENTS

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.

2.0 SCOPE

This specification outlines the minimum process requirements for design of Associated gas dehydration package in Binak Plant.

3.0 NORMATIVE REFERENCES

3.1 Local Codes and Standard

IPS-C-PI-240	Construction Standard for Plant Piping System
IPS-C-PI-350	Plant Piping System Pressure Testing.
IPS-E-PI-200	Engineering Standard for Flexibility Analysis
IPS-E-PI-221.1	Engineering Standard for Piping Material Selection.
IPS-E-PI-240	Engineering Standard for Plant Piping System
IPS-E-PR-308	Engineering Standard for Numbering system
IPS-G-ME-150	Towers, Reactors, Pressure Vessels and Internals
IPS-E-GN-100	Engineering Standard for Units
IPS-E-PR-170	Engineering Standard for Process Flow Diagram
IPS-E-PR-200	Engineering Standard for Basic Engineering Design Data
IPS-E-PR-230	Engineering Standard for Piping& Instrumentation Diagrams (P & IDs)
IPS-E-PR-308	Engineering Standard for Numbering System
IPS-E-PR-330	Engineering Standard for Process Design of Production and Distribution Compressed Air Systems
IPS-E-PR-340	Engineering Standard for Process Design of Fuel Systems
IPS-E-PR-360	Engineering Standard for Process Design of Liquid & Gas Transfer & Storage
IPS-E-PR-440	Engineering Standard for Process Design of Piping Systems (Process Piping & Pipeline Sizing)
IPS-E-PR-450	Engineering Standard for Process Design of Pressure Relieving Systems Inclusive Safety Relief Valves
IPS-E-PR-460	Engineering Standard for Process Design of Flare & Blowdown Systems
IPS-E-PR-470	Engineering Standard for Process Design of Emergency Measures
IPS-E-PR-771	Engineering Standard for Process Requirements of Heat Exchanging Equipment

IPS-E-PR-785	Engineering Standard for Process Design of Air Cooled Heat Exchangers (Air Coolers)
IPS-E-PR-810	Engineering Standard for Process Design of Furnaces
IPS-E-PR-830	Engineering Standard for Process Design of Valves & Control Valves
IPS-E-PR-850	Engineering Standard for Process Requirements of Vessels, Reactors & Separators
IPS-E-PR-880	Engineering Standard for Process Design of Gas (Vapor) – Liquid Separators
IPS-E-PR-190	Layout and spacing

3.2 The Project Documents

BK-GCS-PEDCO-120-PR-PF-0001	Process Flow Diagram (PFD)
BK-GNRAL-PEDCO-000-PR-DB-0001	Process Basis of Design
BK-GCS-PEDCO-120-PR-PI-0013	P&ID - Gas Compression Dehydration Package
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

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.

4.0 ABBREVIATIONS

NISOC:	National Iranian South Oil Company
PFD:	Process Flow Diagram
P&ID:	Piping and Instrumentation Diagram
BFPD:	Barrel Fluid per Day

5.0 BASIS OF DESIGN

5.1 General

D05

The selected process for removing of water from sour gas is TEG solution. Package supplier shall review and verify the best applicable method for this unit.This configuration is expected to represent the likely selected flow scheme but is subject to change by the package supplier and client's preference. Water saturated sour gas from the last stage of compression will be sent to the sour gas dehydration package. In sour gas dehydration package the inlet stream will be brought in counter current contact with TEG in sour gas glycol contactor, in which water vapor is absorbed in the TEG. Water-rich TEG from the bottom of the contactor column is sent under level control to the regeneration system, where at first it passes through a coil in the top of glycol regen still column. This coil provides cooling effect for reflux in still column and pre- heats the rich TEG. Rich TEG after removal of dissolved and entrained gases in glycol flash drum and heating in rich/lean glycol exchanger will enter still column, in which the excess water is removed from TEG solution by heating and boiling. Vapor phase out from top of still column for send to flare header. Hot, regenerated lean TEG accumulates in the glycol surge drum, from where it is initially cooled and then filtered as necessary. Finally, the lean glycol is pumped by lean glycol circulation pumps back to the sour gas glycol contactor. In additionally due to the pressure of the LP flare (1 barg at least) It's necessary that considered the manufacture by vendor such as the ejector for venting gas in to the flare if required. Also permissible amount of pressure drop of dehydration package is 1 barg.

Dehydration package (PK-2101) shall include the following major equipment as shown on the (BK-GCS-PEDCO-120-PR-PI-0013) within boundary limit, but not be limited to:

- Gas Glycol Contactor
- Dehydrated Gas/Lean Glycol Heat Exchanger
- Glycol Regenerator Still Column
- Glycol Surge Drum
- Glycol Flash Drum
- Lean Glycol Circulation Pumps
- Rich Glycol Filter
- Glycol Charcoal Filter
- Glycol After Filters
- Lean Glycol Filters (IF REQUIRED)
- Lean/Rich Glycol Exchanger
- Glycol Regenerator Re-boiler

5.2 Feed Specification

Case	Unit	Summer case	Winter case
Vap Frac on a Mole Basis		1	1
Temperature	C	59.89	60
Pressure	Bar-g	53.9	53.9
Design Temperature	C	130	130
Design Pressure	Bar-g	62	62
Molar Flow	kgmole/h	702.4	703.7
Mass Flow	kg/h	17252.5	15170.9
Heat Flow	kW	-17478.8	-16496.2
component	**Molar component fraction**		
H2O		0.0045	0.0036
CO2		0.0318	0.0252
H2S		0.0544	0.0471
Methane		0.6427	0.7398
Ethane		0.1383	0.1142
Propane		0.0778	0.0474
i-Butane		0.0084	0.0039
n-Butane		0.0187	0.0081
I-Pentane		0.0070	0.0031
N-Pentane		0.0038	0.0014
n-Hexane		0.0066	0.0022
n-Heptane		0.0020	0.0005
n-Octane		0.0006	0.0001
n-Nonane		0.0003	0.0001
n-Decane		0.0001	0.0000
Nitrogen		0.0030	0.0031
Vapour Phase Property			
Phase - Molar Flow	kgmole/h	702.4	703.7
Phase - Mass Flow	kg/h	17252.5	15170.9
Phase Heat Flow	kW	-17478.8	-16496.2
Phase Mass Heat Capacity	kJ/kg-C	2.4	2.4
Phase Actual Gas Flow	ACT_m3/h	291.59	308.15
Phase Std Gas Flow	STD_m3/h	16608.28	16639.38
Phase Molecular Weight		24.56	24.56
Phase Mass Density	kg/m3	59.17	49.23
Phase Viscosity	cP	0.01	0.01
Phase Cp/Cv		1.46	1.43
Phase Z Factor		0.82	0.87

5.3 Product Specification

Vendor is required to guarantees below water content in outgoing dry gas.
The maximum concentration of water in the dry gas at the outlet of the gas dehydration package calculated based on Dew Point equal to 5 °C (determined according to 10 degrees distance from minimum operating temperature) and the result is that 11.63 lb/MMSCF in winter case and 11.43 lb/MMSCF in summer case.

5.4 Control System

Packaged control type B is requested as per BK-GNRAL-PEDCO-000-IN-SP-0004. Unit shall be fully remote controlled (monitoring and control functions) by the DCS and ESD systems. There is no VENDOR supplied control cabinet in control Room for these packages. LCP is required for main monitor/control commands such as burner control command. BMS logic shall be provided by vendor to be implemented in DCS/ESD.
The package is equipped with its instruments, wired by means of appropriate cables and cable routing. The cables are connected to the junction boxes located at the skid edge battery limits or at edge of base plate. All controls are incorporated into the DCS/ESD by the system Vendors.

5.5 Turn Down Ratio

Sour gas dehydration package shall be designed in order to treat 35% of its normal capacity.