

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث خطوط انتقال گاز/مایعات گازی از ایستگاه تقویت فشار گاز بینک تا ایستگاه تزریق گاز سیاهمکان/واحد بهره برداری بینک								
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	BK	PPL	PEDCO	320	EL	MT	0003	D01	

طرح نگهداشت و افزایش تولید 27 مخزن

MTO For Cathodic Protection System for Siahmakan Gas Injection

نگهداشت و افزایش تولید میدان نفتی بینک

D01	Mar. 2025	IFI	S.Medhat	M.Fakharian	S.Faramarzpour	
D00	Apr. 2022	IFI	H.Shakiba	M.Aki	M.Mehrshad	
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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, New Gas/Condensate Pipelines (from Binak New GCS to Siahmakan GIS/Binak PU) shall be constructed.

GENERAL DEFINITION

The following terms shall be used in this document.

CLIENT:	National Iranian South Oilfields Company (NISOC)
PROJECT:	Binak Oilfield Development – Surface Facilities; Gas & Gas-Condensate Pipelines
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 COMPANY (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 COMPANY 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 covers Material Take Off of cathodic protection system of UG pipeline section from Gas Compressor station to Gas injection facility.

It shall be used in conjunction with data/requisition sheets for present document subject.

3.0 NORMATIVE REFERENCES

3.1 LOCAL CODES AND STANDARDS

- IPS-E-TP-820 Engineering Standard for Electrochemical Protection
- IPS-C-TP-820 Construction Standard for Cathodic Protection
- IPS-I-TP-820: Inspection Standard for Monitoring Cathodic Protection
- IPS-M-TP-750 Material and Equipment Standard For Cathodic Protection

3.2 INTERNATIONAL CODES AND STANDARDS

- ASTM American Society for Testing Materials Relevant Parts
- API 610 Centrifugal Pumps for General Refinery Service, 10th Edition
- NACE SP 0169 Control of External Corrosion on Underground or Submerged Metallic Piping System.
- NACE-SP 0286 The Electrical Isolation of Cathodically Protected Pipelines.
- BS 7361(1991) Cathodic Protection Part 1. Code of Practice for Land and Marine Applications.
- NACE SP 0177 Mitigation of Alternating Current and Lightning Effects on Metallic Structures and Corrosion Control Systems.
- ISO 15589,1-2 Cathodic protection of pipeline transportation systems
- NACE SP 0502 External corrosion direct assessment (ECDA) process — assessing and reducing the impact of external corrosion on pipeline integrity.
- NACE SP 0207 Performing Close-Interval Potential Surveys and DC Surface Potential Gradient Surveys on Buried or Submerged Metallic Pipelines.

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- NACE-SP0104 The Use of Coupons for Cathodic Protection Monitoring Applications

3.3 THE PROJECT DOCUMENTS

- BK-GCS-PEDCO-120-EL-CN-0008 Specification for Cathodic Protection System
- BK-GNRAL-PEDCO-HD-000-EL-DC-0001 Electrical System Design Criteria
- BK- GCS - PEDCO -320-GT-RT-0001 Geotechnical Report

3.4 ENVIRONMENTAL DATA

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

Cathodic Protection System shall be designed for use under the conditions specified as below:

Ambient temperatures for equipment:

Maximum design temperature indoor/outdoor (under sun shade)	+55°C
Minimum design temperature	-5°C
Maximum surface temperature exposed to the sun	85°C
Maximum relative humidity	100%
Altitude	<1000m above sea Level
Special Atmospheric Condition	dust and salt corrosive

For the ambient conditions special care will be paid to:

- Enclosures of equipment for outdoor installation
- Painting and coating of metal parts to resist to the severe environmental conditions
- Any environmental derating factors shall be considered by vendor before design

3.5 ORDER OF PRECEDENCE

In case of conflict between requirements specified herein & the requirements of any other referenced document, the most approved stringent requirements of below listed items shall be considered based on the approval given by the owner's representative:

Purchase order

Material Requisition

MTO & Data Sheet

This Specification

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث خطوط انتقال گاز/مایعات گازی از ایستگاه تقویت فشار گاز بینک تا ایستگاه تزریق گاز سیاهمکان/واحد بهره برداری بینک								
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Drawing & Other Specification

Reference Project Specification

Iranian Petroleum Standard (IPS)

Reference international Code & Standards

When the term “Authorized”, Authorization”, “Approval”, or “Approved” are used in this specification, it shall mean authorization or Approval from OWNER.

In case of any conflict between the project documents, the most stringent one shall be considered.

4.0 MTO FOR PERMANENT CATHODIC PROTECTION SYSTEM

ITEM	DESCRIPTION	UNIT	QTY
1	Transformer/Rectifier, Outdoor, 3-Phase, 400 V, 50 Hz. IP 55, DC Output: 50V-100 A, ONAN , Oil immersed type, continuous duty. Transformer/Rectifier equipped with step less voltage regulating system and thyristor control , IPS-M-EL-155 and IEC 60146.	Set	2
2	AC Supply Box “The AC Supply Box enclosure shall have a minimum, degree of protection IP-54 (in accordance with IEC-60 529), The AC Supply Boxes shall be supplied with all necessary accessories such as copper link, cable lugs, 25 Amp Miniature fuse, with suitable MCCB , Support and the others.	No.	2
3	Earthing System for Transformer Rectifiers (Hard Copper), Copper Earthing set, with all accessories such as 2 copper rods (1500×16mm), 1 driving cap, 1 driving tip, 1 coupling screw, and 2 conductor clamps. (IPS-D-TP-717)	Set	2
4	MMO Anode TUBLAR, 25 x1000 mm dimension with 5 m 1x16 HMWPE/PVDF attached cable; anodes shall be canister type with suitable coke breeze backfill type III	No.	44
5	3-way splicing kit with line tap or relevant clamp , according to IPS-M-TP-750	No.	44
6	1×35 mm2 Single Core Copper Conductor Cu/XLPE/Bd/PVC cable for Anode Header Cable, RED	m	450

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7	Negative Bond Box, Safe type , "The negative 6 Terminal bond box enclosure shall have a minimum, degree of protection IP-54 (in accordance with IEC-60529 and IPS type), The negative bond boxes shall be supplied with all necessary accessories such as 2 copper links, 6 cable lugs, couplings, 6 cable glands, 6 cable tag number , supports and the others. With resistors 2 no.s 4 ohm-25 watt.	No.	2
8	Safe Type, Positive Bond Box "The Positive 4 Terminal bond box enclosure shall have a minimum, degree of protection IP-54 (in accordance with IEC-60 529 and IPS type), The positive bond boxes shall be supplied with all necessary accessories such as 2 copper links 4 cable lugs, couplings, 4 cable glands, 4 cable tag number, supports and the others.	No.	2
9	1×50 mm2 Single Core Copper Conductor Cu/XLPE/Bd/AWA/PVC cable for Main Negative and Drain Cable, Black, from T/R to Negative Bond Box and Pipe	m	150
10	1×50 mm2 Single Core Copper Conductor Cu/XLPE/Bd/AWA/PVC cable for Main Positive Cable, Red, from T/R to Positive Bond Box	m	500
11	Concrete Type Test Point with 3 no.s terminals	No.	45
12	Concrete Type Test Box for Crossings and river, with 4 no.s terminals and resistors	No.	7
13	Ground Bed Marker, Coated carbon steel as per Installation Drawing	No.	4
14	Cable 1*16 mm2 Cu/XLPE/Bd/PVC for test connection	Mt	600
15	Handy Cap 4*4"	No.	120
16	Primer for Handy Cap, liquid	Lit	4
17	Exothermic weld mould for connecting cable 35 mm ² to 8" pipe	No.	2
18	Exothermic weld mould for connecting cable 16 mm ² to 8" pipe	No.	2
19	Powder 32 gr for above item	No.	120
20	Cleaning tool Kits	Set	4

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21	Anode Vent Pipe (6" Dia.) min 3 m length, none asbestos type, with H type header	No.	44
22	Safe- Type spark gap 100KA	No.	2
23	Bulk Material including cable lug, shroud, conduit, nut and bolt	Pack	2
24	PORTABLE REFERENCE ELECTRODE (Cu/CuSO ₄)	No	1
25	Digital Multimeter	No	1
26	Stainless Steel Cable Tag	Lot	1
27	Zinc Earthing Cell, double electrode type, 35x35x1525 mm with 10m Cable 1*16 mm ² XLPE/PVC , IPS type box and supports.	Set	2
28	Synchronizing GPS system with antenna and all of accessories such as boxes or etc.	Set	2

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5.0 MTO FOR TEMPORARY CATHODIC PROTECTION SYSTEM

ITEM	DESCRIPTION	UNIT	QTY
1	Magnesium anode 32 Lbs with 3 m 1*16 XLPE/PVC cable, High potential Type, (-1700~1750 mV V _{OC} P) prepackaged, complete with backfill material	No.	25
2	Handy Cap 4*4"	No.	25
3	Primer for Handy Cap, liquid	Lit	2
4	Exothermic weld mould for connecting cable 16 mm ² to 8" pipe	No.	2
5	Powder 32 gr for above item	No.	25
6	Cleaning tool Kits	Set	1
7	Miscellaneous Materials	Set	1

6.0 MTO FOR INTERFERENCES (RIVER)

ITEM	DESCRIPTION	UNIT	QTY
1	Magnesium anode 9 Lbs with 3 m 1*16 XLPE/PVC cable, High potential Type, (-1700~1750 mV V _{OC} P) prepackaged, complete with backfill material	No.	1
2	Handy Cap 4*4"	No.	2
3	Primer for Handy Cap, liquid	Lit	0.5
4	Exothermic weld mould for connecting cable 16 mm ² to 8" pipe	No.	2
5	Powder 32 gr for above item	No.	2
6	Miscellaneous Materials	Set	1

7.0 MTO FOR MTO FOR INTERFERENCES (CROSSING)

ITEM	DESCRIPTION	UNIT	QTY
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1	Magnesium anode 17 Lbs with 3 m 1*16 XLPE/PVC cable, High potential Type, (- 1700~1750 mV V _{OCF}) prepackaged, complete with backfill material	No.	12
2	Handy Cap 4*4"	No.	30
3	Primer for Handy Cap, liquid	Lit	2
4	Exothermic weld mould for connecting cable 16 mm ² to 8" pipe	No.	4
5	Powder 32 gr for above item	No.	30
6	Miscellaneous Materials	Set	2
7	Cable 1*16 mm ² XLPE/PVC for bonding connections	m	400

8.0 MTO FOR MTO FOR INTERFERENCES (AC INTERFERENCES)

ITEM	DESCRIPTION	UNIT	QTY
1	Zinc anode with 3 m 1*16 XLPE/PVC cable , prepackaged, complete with backfill material	No.	1
2	Handy Cap 4*4"	No.	2
3	Primer for Handy Cap, liquid	Lit	2
4	Exothermic weld mould for connecting cable 16 mm ² to 8" pipe	No.	4
5	Powder 32 gr for above item	No.	2
6	Miscellaneous Materials	Set	1
7	Cable 1*16 mm ² XLPE/PVC for bonding connections	m	50
8	Polarization Cell Replacement , with suitable accessories	Set	1
9	Suitable safe boxes for AC damping , 4 no.s terminals , support and glands	No.	1