طرح نگهداشت و افزایش تولید ۲۷ مخزن

SURFACE PREPARATION AND PAINTING PROCEDURE

نگهداشت و افزایش تولید میدان نفتی بینک

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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.

2.0 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)
OWNER:	OWNER is collectively refer to National Iranian South Oil Company (NISOC) and Petro Iran Development Company (PEDCO)
EPC CONTRACTOR:	Joint Venture of: Hirgan Energy – Design & Inspection (D&I) Companies
VENDOR:	HAVAYAR Company
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.

3.0 SCOPE

This Specification covers the general requirements for selection of painting materials, surface preparation, application procedure and inspection for protective coatings to be used for BINK Oilfield Wellhead Facilities and Manifold Extension

4.0 APPLICABLE STANDARDS

- BK-GNRAL-PEDCO-000-PI-SP-0006_D04 Specification for Painting

- **Iranian Petroleum Standard (IPS)**

- IPS-E-TP-100 Engineering Standard for Paint
- IPS-C-TP-101 Construction Standard for Surface Preparation
- IPS-C-TP-102 Construction Standard for Surface Painting
- IPS-M-TP-130 Material and Equipment Standard for Coloured Alkyd Paint for Top Coat (Finish) Except White
- PS-M-TP-168 Material standard for Acrylic Silicon Finish Paint for Temperature Application up to 200°C
- IPS-M-TP-175 Material and Equipment Standard for Silicone Alkyd Paint (White or Coloured) as Top Coat (Finish)
- IPS-M-TP-205 Material & Equipment Standard for Zinc Rich Epoxy as Primer, Intermediate & Top Coat
- IPS-M-TP-210 Material & Equipment Standard for Zinc silicate paint As Primer, Intermediate & Top Coat
- IPS-M-TP-235 Material & Equipment Standard for Two Pack Poly Urethane Paint as Top Coat
- IPS-M-TP-220 Material & Equipment Standard for Epoxy Polyamide Intermediate Paint
- IPS-M-TP-225 Material and Equipment Standard for Epoxy Polyamide Paint as Top Coat (Finish)

- **INTERNATIONAL CODE AND STANDARDS, Steel Structures Painting Council (SSPC)**

- SSPC-P A1 Paint Application Specification No.1: Shop, Field and Maintenance Painting.

- SSPC-PA2 Paint Application Specification No.2: Measurement of Dry Paint Thickness with Magnetic Gauges.
- SSPC-P A3 Paint Application Guide No.3: A Guide to Safety in Paint Application SSPC-SP COM Surface Preparation Specification Outfaces Preparation Commentary.
- SSPC-SP 3 Surface Preparation Specifications No.3: Power Tool Cleaning

- **American Society of Testing Materials (ASTM)**

- ASTM A153 Specification for zinc coating (hot-dip) on iron and steel
- ASTM A123 Specification for zinc (hot galvanized) coatings on products fabricated from rolled, pressed and forged steel shapes, plates bars and strip
- ASTM D185 Standard Test Methods for Coarse Particles in Pigments, Pastes, and Paints

5.0 EXTENT OF SURFACE TO BE PAINTED

5.1. SURFACE TO BE PAINTED

The following surfaces shall be completely painted.

- ❖ Compressor
- ❖ Pump
- ❖ Baseplate
- ❖ Auxiliary piping (Carbon steel parts) and piping supports
- ❖ Vessel & Heat Exchanger

5.2. SURFACE NOT TO BE PAINTED

Painting shall not be applied on the following surfaces. (If any)

- ❖ Stainless steel,
- ❖ Nickel, aluminum,
- ❖ Galvanized iron
- ❖ Other metals not subject to corrosion, concrete and masonry surfaces.

6.0 SURFACE PREPARATION

- All surfaces to be painted shall be cleaned of oil or grease or other similar materials with solvent and then will be brushed and blasted with air to remove rust or scale.
- All mill-scale, rust scale, paint marks or foreign matter shall be removed by shot-blasting, grit-blasting, or sandblasting.
- Before shop primer is applied, dust, sand residue, crushed steel shot or any grit and all other contaminants must be removed from the surface using a vacuum cleaner, like air blower.
- For Compressor Body & Snubber & Cooler & Piping (Carbon): A near-white metal blast cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dust,

dirt, mill scale, rust, coating, oxides, corrosion products, and other foreign matter, except for staining. Random staining shall be limited to no more than 5 percent of each unit area of surface and may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied coating. And for Motor, Valves, Pump, Safety valve & Control Panel: Manufacture Standard.

- Surfaces shall be blast cleaned to obtain a roughness 50~75 micron range for Carbon steel surfaces.
- During surface preparation, care shall be taken not to damage or alter identification plates, machined surfaces and parts coated in the factory. These parts shall be properly protected.
- All bolt holes shall be drilled and blunted before blasting.

7.0 PROCEDURE

- While working, it should be visually confirmed whether the painting work instruction matches the paint colour or not.
- All dust, oil, grease, impurities, etc. shall be removed from surface prior to painting.
- After surface treatment all painting work should perform before rust appear on the surface. If signs of rust appear, it should be reworked according to regulated surface treatment procedure.
- The use of diluent materials of paint should be strictly performed according to product data sheet or instruction of paint manufacturer.
- After undercoat painting, topcoat painting should be performed with sufficient time to dry according to instruction of paint manufacturer.
- Painting shall be done in following conditions:
  - ❖ Temperature: Min. 5 0C (41 0F), Max. 50 0C (122 0F)
  - ❖ Humidity : Max 80 %
  - ❖ Drying : Natural drying
  - ❖ The surface temperature of the equipment is over 30 °C than atmospheric dew po
- Paint shall not be applied to surface:
  - ❖ During rain, snow, fog or when dust is in suspension in the air, when wind velocity exceeds 7 m/s.
  - ❖ In areas where harmful particles are in sus nsion.
  - ❖ When surface temperature is less than 30 above the surrounding air's dew point.
  - ❖ When relative humidity is greater than 85 % (95% when applying inorganic zinc silicate).
  - ❖ When temperature is below 5 0C.

8.0 APPLICATION DETAILS

8.1 PREPARATION OF PAINTING

Paintings should be prepared for application according to the instructions. Individual components of multi-component paintings must be stirred before mixing. If the thinner is required, only

designated thinner should be used and thinning rate may be adjusted according to the job condition.

8.2 APPLICATION METHOD

- Airless spray is the most effective in obtaining specified thickness at once.
- The spray gun shall be kept at constant distance and perpendicular to the surfaces.
- Brush or roller may be required to achieve the specified thickness.

8.3 APPLICATION WORK

- Welding seams, corners and edges should always receive a stripe coat before full coating in order to obtain adequate film built.
- Bolt jointing surroundings and flange matching faces should be blanked off or otherwise accepted.
- Special care should be taken to gain uniform thickness.
- Each coat should be allowed enough to dry and interval between coats.

8.4 CLEANING OF TOOLS

The application tools and equipment should be cleaned with the thinner immediately after use.

9.0 INSPECTION

9.1 visual inspection

after painting, the surfaces shall be inspected visually for wrinkle, swelling and other harmful defects. if repair coating is required, applicable surfaces shall be arranged by sand paper and re-coated with the same paint.

9.2 coating thickness inspection

1-the average of the acceptable spot readings shall be no less than the specified minimum thickness. no single spot reading shall be less than 80% of the specified minimum.

2-the average of the acceptable spot readings shall be no more than the specified maximum thickness. no single spot reading shall be more than 120% of the specified maximum.

9.3 adhesion test

painting adhesion has to be verified according to ASTM D 3359. the obtained values must not be worse than 4a and 4b (ASTM d 3359).

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10.0 APPENDIX#1

Tag Name	Insulation(Y\N)	Operating Temp. (°C)	Surface Preparation	Primer Coat		Mid Coat		Top Coat			Total Thk (µm)
				IPS No.	Min. D.F.T (µm)	IPS No.	Min. D.F.T (µm)	IPS No.	Min. D.F.T (µm)	RAL / COLOR	
Compressor Body	Manufacture Standard										
Common Bed & Structure	N	~120	SA 2 1/2	205	75	220	80	235	50	7047/ Tele gray 4	205
Piping (Carbon Steel)	N	~120	SA 2 1/2	205	75	220	80	235	50	7047/ Tele gray 4	205
Piping (Carbon Steel)	N	121~200	SA 3	210	70	168	25	168	25	7047/ Tele gray 4	120
Piping (Carbon Steel)	Y	~120	SA 2 1/2	205	50	220	2*100	-	-	-	250
Piping (Carbon Steel)	Y	121~350	SA 3	210	70	-	-	Silicon Aluminum	25	-	95
Piping (Stainless steel)	Y/N	No Paint									
Vessel (Suc. Snubber)	Y	~120	SA 2 1/2	205	50	220	2*100	-	-	-	250
Vessel (Disch. Snubber)	Y	121~350	SA 3	210	70	-	-	Silicon Aluminum	25	-	95
Coupling Cover	N	Manufacture Standard									
Air Cooler (Stainless steel)	N	No Paint									
Air Cooler (Carbon Steel)	N	~120	SA 2 1/2	205	75	220	80	235	50	7047/ Tele gray 4	205

Safety Valve	N	Manufacture Standard
Motor	N	Manufacture Standard
Pump	N	Manufacture Standard
Filter	N	Manufacture Standard

IPS No. description:

- **205:** Zinc-Rich Epoxy Paint (Organic Zinc-Rich) IPS-M-TP-205
- **220:** Epoxy Polyamide Intermediate Paint IPS-M-TP-220
- **235:** Two Pack Aliphatic Polyurethane Paint IPS-M-TP-235
- **210:** Zinc Silicate (Inorganic Zinc Rich) Paint IPS-M-TP-210
- **168:** Acrylic Silicon Finish Paint for Temperature up to 200°C IPS-M-TP-168

11.0 PAINTING REPORT

PROJECT : ----	PICKLING & RUST PREVENTION & PAINTING INSPECTION REPORT	HAVAYAR INDUSTRIAL GROUP
CLIENT : ----		
MANUFAC. : HAVAYAR	ITEM NO. : -----	DWG. NO. : ------
INSPECTOR: ----	REQ. NO. : ------	DATE : -----

Applicable Documents / Procedure :

Surface Preparation

Inspection Program :

Preparation Method : ☐ ShotBlasting ☐ Chemical (Pickling , Passivution , Neutralization) ☐ SandBlasting ☐ Mechanical ☐ As Welded ☐ Other

Grit of Medium : ☐ Shot ☐ Corundum ☐ Steam ☐ Sand ☐ Acid

Preparation Grade : Sa1 ☐ Sa2 ☐ Sa2 1/2 ☐ Sa3 ☐ St2 ☐ St3 ☐

Examination Method :

Note : Internal Surfaces Accurately Drained & Dried

Results	☐ SATISFACTORY ☐ UNSATISFACTORY	

Painting

Inspection Program :

Coat	Paint Type	RAL	Actual THK. µm	Req. THK. µm
1				
2				
3				
4				
Equipment Type :		Total THK.		

Results	☐ SATISFACTORY ☐ UNSATISFACTORY	

VENDOR	INSPECTOR	TPI
Date :	Date :	Date :