



نگهداشت و افزایش تولید میدان نفتی بینک
سطح الارض



احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک



شماره پیمان:

SPECIFICATION FOR NITROGEN PACKAGE

شماره صفحه: ۱ از ۲۲

۰۵۳ - ۰۷۳ - ۹۱۸۴

نسخه	سرنال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه
D05	0014	SP	ME	120	PEDCO	GCS	BK

طرح نگهداشت و افزایش تولید ۲۷ مخزن

SPECIFICATION FOR NITROGEN PACKAGE

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
 AB-A: As-Built -Approved



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 <p>NISOC</p>	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>																							
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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
GENERAL 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

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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 document covers minimum necessary requirements for the design, selection, manufacture, inspection, testing and delivery of nitrogen generation packages.

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

3.0 NORMATIVE REFERENCES

The latest edition of following codes & standards are applicable in this project (unless otherwise mentioned):

3.1 LOCAL CODES AND STANDARDS



- IPS-M-PI-150 Material and Equipment Standard for Flanges & Fittings
- IPS-E-TP-350 Engineering Standard for Linings
- IPS-E-EL-100 Engineering Standard for Electrical System Design
- IPS-M-EL-131 Material & Equipment Standard for LV Induction Motor
- IPS-M-EL-132 Material & Equipment Standard for Medium & High Voltage Induction Motor
- IPS-E-CE-120 Engineering Standard Foundations
- IPS-E-CE-500 Engineering Standard for Loads

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک							
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- IPS-E-TP-700 Engineering Standard for Thermal Insulation
- IPS-E-TP-740 Engineering Standard for Corrosion Considerations in Material Selection
- IPS-G-GN-210 General Standard for Packing and Packages
- IPS-G-ME-150(1) General Standard for Towers, Reactors, Pressure Vessels and Internals.
- IPS-G-ME-245(1) Engineering and Material Standard for Air Cooled Heat Exchangers
- IPS-E-PR-330 Process Design of Compressed Air System
- IPS-E-PR-880(1) Engineering Standard for Process Design of Gas-Liquid Separators
- IPS-E-PR-850(1) Engineering Standard for Process Requirements of Vessels and Separators
- IPS-G-PI-230(1) General Standard for Strainers and Filters
- IPS-M-EL-138(1) Material and Equipment Standard for Synchronous Generators
- IPS-M-PM-220 Rotary type Positive Displacement Compressors
- IPS Standard drawings

3.2 INTERNATIONAL CODES AND STANDARDS

- ASME American Society of Mechanical Engineers
 - B16.9 Steel Butt Welding Fittings
 - B16.11 Forged Steel Fittings, Socket Welding and Threaded
 - B16.21 Non- Metallic Gaskets For Pipe Flanges



 <p>NISOC</p>	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>																							
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- B16.25 Butt Welding Ends
- Sec. VIII Rules for Construction of Pressure Vessels.

- ASCE 7-02 Minimum Design Loads For Buildings and Other Structures
- ISO 10440-2 Petroleum and Natural Gas Industries –Rotary type Positive Displacement Compressors
- API 619 Rotary-type Positive Displacement Compressors
- Welding Research Council (WRC)
 - 107 Local Stresses in Spherical & Cylindrical Shells Due to External Loading
 - 297 Local Stresses in Cylindrical Shells Due to External Loadings on Nozzles–Supplement to WRC Bulletin No. 107
- BS PD 5500, APP. G British Standard; Specification for Unfired Fusion Welded Pressure Vessels (Recommendations for the Design of Local Loads, Thermal Gradients, etc.)
- API 661 Air-Cooled Heat Exchangers for General Refinery Service

3.3 THE PROJECT DOCUMENTS

- BK-GNRAL-PEDCO-000-PI-SP-0003 Specification for the Design of Piping in Mechanical Packages
- BK-GNRAL-PEDCO-000-PR-DB-0001 Process Basis of Design
- BK-GNRAL-PEDCO-000-PR-DC-0001 Process Design Criteria

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- BK-GNRAL-PEDCO-000-ME-DC-0001 Mechanical Design Criteria
- BK-GNRAL-PEDCO-000-ME-SP-0001 Specification For Pressure Vessels
- BK-GNRAL-PEDCO-000-SA-SP-0002 Specification For Hazardous Area Classification
- BK-GCS-PEDCO-120-PI-SP-0001 Piping Material Specification
- BK-GNRAL-PEDCO-000-PI-SP-0005 Specification For Fittings, Flanges, Gaskets and Bolts
- BK-GNRAL-PEDCO-000-PL-SP-0002 Specification For Metallic Pipes
- BK-GNRAL-PEDCO-000-PI-SP-0006 Specification For Painting
- BK-GNRAL-PEDCO-000-PI-SP-0011 Specification For Welding of Plant Piping System
- BK-GNRAL-PEDCO-000-IN-SP-0001 Specification For Instrumentation
- BK-GNRAL-PEDCO-000-IN-SP-0004 Specification For Instrument and Control of Package Unit System (PU)
- BK-GNRAL-PEDCO-000-EL-SP-0011 Specification For Electrical Requirements of Packaged Units
- BK-GNRAL-PEDCO-000-EL-SP-0006 Specification For Earthing & Lightning System
- BK-GCS-PEDCO-120-PR-UF-0001 Utility Flow Diagrams
- BK-GCS-PEDCO-120-PR-PI-0016 P&ID - Nitrogen Generation System
- BK-GCS-PEDCO-120-PI-RT-0001 Corrosion Study & Material Selection Report
- BK-GCS-PEDCO-120-PR-SP-0002 Duty Specification for Instrument/Plant Air & Nitrogen Packages

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➤ BK-GCS-PEDCO-120-ME-SP-0006

Specification for Air Compressor Package

3.4 ENVIRONMENTAL DATA

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

3.5 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 SYMBOLS AND ABBREVIATIONS

The following abbreviations have been used in this document.

W/W	Weight to Weight Ratio
ppm	Parts per Million
ITP	Inspection & Test Plan

5.0 SCOPE AND LIMITS OF SUPPLY AND SERVICES



The Vendor's responsibilities, scope of supply and services shall include, but not necessarily be limited to the following:

5.1 SCOPE OF SUPPLY

Engineering activities for the design of packaged units shall meet the process requirements as specified on data sheets and P&I Diagrams.



Documentation for information and /or approval as required. Detail requirements will be dedicated forms included in material requisition.

Data Book containing final technical documentation for all equipment within the scope of supply, including Brochures, operating and maintenance manual.

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Supply of Nitrogen Packages, complete of:

- Twin tower including all necessary internals
- Adsorption Vessel Modules
- Pre-Filtration systems
- After- filtration systems
- Automatic draining (condensate water, purge air, etc.)
- Supporting assembly for Nitrogen Generation unit
- Control panel (UCP)
- Power panel
- Gauge board
- Air K.O. drum
- Air compressors
- Air cooler
- Inlet silencer
- Outlet water separator
- Chiller for cooling of inlet wet air(if required)
- Silencer for air regeneration discharge line
- N2 Generator
- Dual Particulate Filters(Cartridge Element) (if required)
- O2 analyzer at discharge of each air N2 Generator(at downstream of particulate filters)
- PDI for Filters and beds
- UV (on-off valve) for temperature control, TT, check valve for Nitrogen Gaseous discharge line.
- All required TSV,PSV and on/off valves for gaseous nitrogen lines for safe operation
- Exhaust silencers
- Any other equipment necessary for safe & continuous operation of the package
- Drawing and documentation
- Common mounting plate
- All required pipe work (piping, valves, check valves, etc.)

 <p>NISOC</p>	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>																							
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- Wiring, cabling, junction boxes and glands within the base plate limits
- Painting & coating as per "Specification for Painting; doc. No. BK-GNRAL-PEDCO-000-PI-SP-0006."
- Commissioning and installation supervision

5.2 LIMITS OF SUPPLY

The equipment shall be delivered with the following accessories:

- Lifting lugs
- Bracket for name plate and name plate
- Necessary pipe supports (if any)
- Earthing system and related connection
- First fill of consumables
- The necessary spare parts for commissioning and start-up
- Special tools, if any

5.3 SCOPE OF SERVICES

- Complete detailed engineering, design and calculations,
- Fabrication and assembly of the equipment,
- Purchasing of raw materials, parts, etc.
- Shop tests and inspection,
- Cleaning and flushing after test,
- Preservation, protection and painting,
- Marking,
- Preparation for shipment and packing,
- Shipping and transportation to the site,
- Attending at all meetings held by CLIENT,

 <p>NISOC</p>	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>																							
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- Submitting list of spare parts for 2 (two) years operation,
- Test certification

5.4 VENDOR'S RESPONSIBILITIES

Vendor has the sole responsibility of design, manufacture, assembly, inspection, test, packing, and shipment of the subject packages.

Vendor is responsible for start-up and commissioning during plant operation. These activities shall be done in cooperation with one Iranian CLIENT.

Vendor shall fully comply with the requirements of this specification. Vendor shall express any deviation in writing. In otherwise, the vendor shall be guaranteed that there is not any deviation between the consumables and the client documents.

Approval of Vendor's drawings shall not relieve vendor from responsibility with regard to performance of the equipment specified therein.

The Vendor shall ensure that all Sub-vendors comply with all applicable parts of this specification and related documents, standards and codes.

Compliance with the requirements of this specification does not relieve the Vendor of the responsibility of furnishing equipment and accessories of the proper design, mechanically suited to meet the specified service requirements.

The vendor shall develop the relevant P&IDs in detail based on the project P&IDs, identifying scope of supply and interface with control system.

6.0 GENERAL DESIGN CONDITIONS

6.1 DESIGN CONDITIONS

Nitrogen package units shall be according to Vendor's standard process design and in compliance with this specification, the process requirements stated on respective process and Mechanical data sheets furthermore vendor documents shall be approved by CLIENT.

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Material of construction shall be chosen as per the data sheets.

6.2 MECHANICAL DESIGN DATA

6.2.1 GENERAL

The skid shall be completely self-contained with all mechanical equipment, piping, valves instruments and electrical items fully pre-wired and piped, platforms and access ladders (if require).

Design life of the Package shall be a minimum of 20 years.

Vessels and filtration systems of the Nitrogen generation package shall be designed and manufactured to ASME code Sec. VIII, IPS-G-ME-150(1) and "Specification For Pressure Vessels; Doc. No. BK-GNRAL-PEDCO-000-ME-SP-0001 ".

Each package will comprise two identical PSA vessels in parallel operation. One Vessel will be in operation and the other on regeneration. The design capacity of package is stated in the material requisition and data sheets. PSA N₂ generator is subject to the high cycle fatigue loads. FEA and ASME VIII-2 are necessary.

Maximum allowable noise level produced by each individual unit in operation shall be less than 85 dB at 1 meter from the involved equipment.

The surface temperature of any exposed surface shall not exceed 85°C.

For all parts made of carbon steel, corrosion allowance of 3.2 mm and for the stainless steel material corrosion allowance of zero shall be considered.

6.2.2 ADSORPTION VESSEL MODULES

PSA vessel separators will be provided for package. The vendor will select the Pressure Swing Adsorption (PSA) material required to meet the rated continuous duty. Separator design shall be in accordance with "Specification For Pressure Vessels; Doc. No. BK-GNRAL-PEDCO-000-ME-SP-0001 ", Codes and standards ASME VIII and IPS-G-ME-150(1).

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6.2.3 PRE- FILTRATION SYSTEMS AND AFTER FILTRATION SYSTEMS

One operating and one standby inlet filtration systems shall be provided. filtration system type and filtration specification shall be by Vendor to ensure satisfactory operation of the package. They shall be sized for full flow, continuous operation and fitted with quick release type closures. filtration system design shall be in accordance with "Specification For Pressure Vessels; Doc. No. BK-GNRAL-PEDCO-000-ME-SP-0001 ", Codes and standards ASME VIII and IPS-G-ME-150(1).

One operating and one standby activated carbon filters shall be provided, adequately sized to meet the flow conditions as stated in the material requisition data sheets. They shall be fitted with quick release type closures and carbon discharge point. Filter design shall be in accordance with "Specification For Pressure Vessels; Doc. No. BK-GNRAL-PEDCO-000-ME-SP-0001 ", Codes and standards ASME VIII and IPS-G-ME-150(1).

6.2.4 MATERIAL

All materials used in the fabrication shall be new and have a minimum quality as specified in data sheets and shall be in accordance with ASME specifications and standards.

For all parts made of carbon steel or stainless steel corrosion allowance shall be in accordance with the project "Corrosion Study & Material Selection Report" and related Data Sheet.

The nitrogen generator vessels shall be made of carbon steel material. All welded internal parts shall be of stainless steel.

The skid shall be fabricated from structural steel.

The Vendor shall provide all necessary information for a good understanding of the base materials employed. In particular, the Vendor shall specify:

- Their origin,
- Their method of preparation,
- Their chemical composition.

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The material used for the construction of the equipment shall not cause chemical/electro-chemical reactions between one another.

As the project proceeds, the Vendor shall not under any circumstances be allowed to change the materials of any part without "EPC CONTRACTOR"'s prior written approval.

Material requirements and certification shall be as specified in the Material Requisition.

6.2.5 PIPING AND CONNECTIONS

All package piping and valves shall comply with the requirements of the "Piping Material Specification; Doc. No. BK-GCS-PEDCO-120-PI-SP-0001 ". On skid piping shall be in accordance with ANSI B31.3 and Specification for the Design of Piping in Mechanical Packages; Doc. No. "BK-GNRAL-PEDCO-000-PI-SP-0003" and fully welded. Raised face weld neck flanged joints shall be provided only for maintenance purposes. The piping arrangement shall provide adequate clearances for installation, removal and access for maintenance and operation.

The structural analysis for the structure and stress analysis for piping within the skid (NPS 6" and more) shall be design as per project documents.

Minimum connection size shall be NPS ½".

All piping Tie-in(s) shall be flanged and brought out to the edge of package mounting plate in a way that only one connection to be exist for each service.

All piping Tie-in(s) shall be designed so that movements and rotation tend to zero and allowable imposed loads and moments from piping conform to the Specification for Nozzle loads; Doc. No "BK-GNRAL-PEDCO-000-PI-SP-0020".

6.2.6 BASEPLATE

All package components shall be mounted on package mounting plate, so as to permit safe access for operation and maintenance activities. Attention shall be paid to potential tripping and overhead hazardsstruct.

Skid shall be designed to be sufficiently rigid to prevent damage or distortion during handling.

The mounting plate shall be equipped with lifting lugs and be suitable for single point lifting.

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Lifting eyes or other lifting facility shall be furnished on each of four corners of the skid. Package lifting beam(s)/frame(s), completes with slings and shackles for transportation, installation and erection.

6.3 PAINTING, COATING

Painting shall be compatible with site and service conditions and "Specification for Painting; Doc. No. BK-GNRAL-PEDCO-000-PI-SP-0006 " and IPS-E-TP-100. Vendor shall provide his painting specification to CLIENT for review and comment. All equipment shall be painted with final coating before shipment. Guarantee duration shall be at least the same as for the whole equipment. All the painting materials shall be compatible with each other.

6.4 NAME PLATE

The name plate of all equipments shall be prepared according to project standard drawings; standard detail drawing for pressure vessels and heat exchangers; Doc. No: BK-GNRAL-PEDCO-000-ME-DW-0001. And standard detail drawing for storage tanks; Doc. No; BK-GNRAL-PEDCO-000-ME-DW-0002. All equipment items shall be supplied with a stainless steel nameplate. The vendor shall submit nameplate drawings for approval. The name plate shall be provided for each Nitrogen package stamped with the following data:

- Nitrogen Generation Package Identification No.
- No Order
- Order placed by
- Vendor's Name
- Type and size Serial No
- Maximum Working Pressure barg
- Hydrostatic Test Pressure barg
- Dew Point Deg. C
- Capacity /Hr
- Regeneration /Hr

 <p>NISOC</p>	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>																							
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- Type of Adsorbent
- Total Adsorbent Charge kg
- Total Package Weight kg
- Heaviest Maintenance kg

The nameplate shall be securely fixed to the relevant equipment, but the method of fixing shall not involve drilling into the wall of a pressure containing part.

6.5 CONTROL, INSTRUMENTATION AND ELECTRICAL REQUIREMENTS

Design, supply and installation shall follow the requirements of the project “Specification For Instrument and Control of package Unit System (PU); Doc. No. BK-GNRAL-PEDCO-000-IN-SP-0004” and “ Specification for Instrumentation; Doc. No. BK-GNRAL-PEDCO-000-IN-SP-0001”.

A PLC based and proprietary microprocessor based control panel shall be used for all electronic, etc. Unless otherwise approved by CLIENT. Control systems shall be designed and supplied by the nitrogen generator’s vendor and shall perform package’s shutdown and Process control. As minimum ingress protection of the panels shall be IP 65.

The Process Control System (PCS) will provide supervisory control of this package via a dual redundant serial link (except for critical data such as differential pressure transmitter of filtration systems that shall be in communication with PCS by hard wire) to the Unit Control Panel (UCP) using an industry standard protocol.

The package shall contain all required local gauges, transmitters, control valves, relief valves, etc., as required for the safe operation of the Package. All instrumentation equipment shall be fully installed in accordance with all relevant Codes, Standards and Regulations that shall be in based on “Specification For Instrument and Control of package Unit System (PU); Doc. No. BK-GNRAL-PEDCO-000-IN-SP-0004”. Transmitters, control valves, etc., shall be cabled to skid edge JBs for subsequent connection, by others, to the PCS. The signal segregation for cable and JBs should be accordance with requirement of the project “Specification For Instrument and Control of package Unit System (PU); Doc. No. BK-GNRAL-PEDCO-000-IN-SP-0004”.

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The VENDOR/BIDDER shall provide fully detailed P&IDs, control & safeguarding narratives and skid wiring diagrams for the equipment within his supply.

All power, control and shutdown cable terminations at skid edge junction boxes shall be fully detailed in interface documentation.

The Package shutdown systems shall be via the Emergency Shutdown system (ESD).

The electrical requirement shall be met with the project "Specification for Electrical Requirements of Packaged Units; Doc. No. BK-GNRAL-PEDCO-000-EL-SP-0011 " and "Specification For Earthing & Lightning System; Doc. No. BK-GNRAL-PEDCO-000-EL-SP-0006.

The UCP panel will be supplied from the 110 VAC feeders coming from the plant's redundant UPS panel. UCP shall derive the required voltage levels (e.g. 24VDC etc) from the incoming 110 VAC using power supply units. Power supply/control voltage of field instruments, alarms, indicating lights, solenoid valve and relays shall be 24 VDC.

Degree of protection shall be suitable for electrical equipment, panels, boxes and instruments for installation in site's safe area and shall be in accordance with relevant data sheets. As minimum ingress protection for outdoor condition shall be IP 65.

Independent terminals and connections shall be considered in UCP for ESD circuits.

7.0 INSPECTION AND TESTS

7.1 INSPECTION

Vendor shall notify to CLIENT of all suborders for design/supply of equipment made to ensure realization of order.

After 45 days advanced notification, Inspector nominated by CLIENT shall have free access, during all periods of manufacturing, test and preparation for shipment, to Vendor or Sub-Vendor plant for inspection.

All shop checking, inspection and testing of the equipment shall be carried out in accordance with the applicable codes and standards, especially ASME SEC. VIII and related ITP.

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All equipment and their materials shall be inspected and tested per requirements set forth in code/standard/or reference specifications, the material requisition and its attachments. However, the acceptance of any work and/or equipment shall not release the Vendor from its responsibility to supply the equipment capable to function properly at the specified site and service conditions, and his guarantees.

7.2 TEST

7.2.1 General

After control by Vendor, final reception can be carried out.

The nitrogen generation package shall be fully assembled and tested in the Vendors factory prior to shipment.

During final reception, conformity to drawings and specification shall be checked.

Test procedures shall be submitted to CLIENT for his review and comments.

7.2.2 Hydrostatic Test

All equipment shall be tested hydrostatically prior to any painting in accordance with applicable codes. Water used for testing carbon and low alloy carbon steel equipment shall contain a suitable corrosion inhibitor. The water temperature shall not be less than +7°C. The concentration of chlorine ions in water used for tests shall not exceed 20 ppm.

The test pressure shall be held at full pressure for a minimum of 30 minutes. After hydrostatic test all test equipment shall be removed and the inside of the equipment shall be completely cleaned and dried.

7.2.3 Non-Destructive Test

Non-destructive test shall be in accordance with applicable codes (ASME, API, etc. and other specifications).

Non-destructive test shall be performed after the Post Weld Heat Treatment and prior to the hydrostatic test.

 <p>NISOC</p>	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>																							
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نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه																	
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7.2.4 Functional Tests

The Vendor shall be responsible for ensuring all calibration and test equipment has valid certification. All instrumentation shall be functionally tested with simulated signals to prove the integrity of the control equipment/instrumentation.

8.0 PREPARATION FOR SHIPMENT

The equipment shall be carefully cleaned inside and outside and free from any foreign matter.

Flanges and connections shall be closed with blind flanges and plugs. Permanent blind flanges or covers included in the Vendor's scope shall be bolted with service stud bolts and nuts.

All tell-tale holes shall be plugged.

All parts shall be marked for identification and conditioned for shipment.

Each loose piece or assembly shall be properly protected to prevent damages during normal shipping and handling.

Before delivery, the equipment shall be properly prepared for shipping and road transport or other possibility (see material requisition).

All bolting shall be lubricated, before assembly.

Preparation for packing and shipment of the equipment shall be in acc. with IPS-G-GN-210.

9.0 SPARE PART INTERCHANGEABLE RECORD LIST(SPIRL)

The spare parts shall be delivered according to the vendor's proposal, the purchaser's approval and at least in accordance with the contents of annex 11 in the contract documents. Vendor shall furnish list for following categories:

- i) Spares for Commissioning and start-up.
- ii) Spares for 2 years of normal operation.
- iii) Special Tools.

 <p>NISOC</p>	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>																							
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پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه																	
BK	GCS	PEDCO	120	ME	SP	0014	D05																	

Commissioning and start-up spares, two years operation spares and Special Tools are in Vendor Scope of Supply.

All spare parts, special tools accessories and parts of package shall be packed in the separate, rugged boxes and marked "Special tools/ Spare parts for (Tag/Item No.)" Each tool shall be stamped or tagged to indicate it intended use; Vendor shall provide a detailed packing list for this equipment.

All spare parts, special tools accessories and parts of package shall be packed in the separate boxes. Vendor shall provide a detailed packing list for this equipment.

Vendor shall recommend special tools for normal operation and maintenance and special lifting gear if necessary for lifting of the equipment components during installation/removal, these shall be itemized in the bid and shall be purchased with the equipment.

10.0 SUPERVISION ON INSTALLATION

Supervision on Installation is in the scope of Vendor. The Vendor shall be present during installation the equipment and shall have supervision on its procedure. It is obvious that the Vendor will be responsible for any problem due to misdoing above mentioned. The Vendor shall individually price all requirements.

11.0 PRE-COMMISSIONING & COMMISSIONING

Pre-commissioning & Commissioning are in the scope of Vendor. The Vendor shall propose all pre-commissioning and commissioning requirements including software and hardware such as Number of Personnel involved, Man-hour of proposed pre-commissioning and commissioning operation etc. Each item shall be individually priced.

Commissioning & start-up and two-year normal operation spare parts shall be considered per attachment 11 of the project EPC contract, as a minimum requirement.

12.0 GUARANTEE AND WARRANTY

The guarantee period shall be eighteen (18) months from the date of delivery and/or twelve (12)

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months from the installation date of each equipment/packages at site. The Vendor shall g
uarantee the process performance of the assembled equipment as specified
on the Data Sheets.

If any defect or mal-performance occurs during the guarantee period, the vendor shall make all
necessary alterations, repairs, and replacements free of charge, fob factory. Field labour charges,
if any, shall be subject to negotiation between vendor and Purchaser.

The Vendor shall warranty required after sale services and supply the required spare parts for 15
years.