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| **طرح نگهداشت و افزایش تولید 27 مخزن** | | | | | | |
| **PMR FOR CENTRIFUGAL PUMPS FOR GENERAL SERVICES**  **نگهداشت و افزایش تولید میدان نفتی بینک** | | | | | | |
| D05 | NOV.2024 | FI | V.Amjadi | M. Fakharian | M.Sadeghian |  |
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| D00 | FEB. 2022 | IFI | H. Adineh | M. Fakharian | M. Mehrshad |  |
| **Rev.** | **Date** | **Purpose of Issue / Status** | **Prepared by:** | **Checked by:** | **Approved by:** | **CLIENT Approval** |
| **Class: 3** | | **CLIENT Doc. Number: F0Z-709233** | | | | |
| **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** | | | | | |

**REVISION RECORD SHEET**

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1. **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 Fcilities; New Gas Compressor Station |
| EPD/EPC CONTRACTOR (GC): | Petro Iran Development Company (PEDCO) |
| EPC CONTRACTOR  /PURCHASER: | 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, vendor or VENDOR. |
| MAY: | Is used where a provision is completely discretionary. |

1. **GENERAL**

* This document presents the item material requisitions for Contractor’s use as appropriate.
* This material requisition covers the requirements for the design, manufacturing, testing and supply of general service pumps as listed below. All equipment/devices/items shall conform to this requisition and all specifications which have been mentioned in attachment 1 of this material requisition.
* The vendor's supply shall include:

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Item** | **Description** | **Total QTY.** |
| 1 | P-2206 | Diesel Pump | 1 |
| 2 | P-2104 | Glycol Drain Pump | 1 |
| 3 | P-2209 | Potable Water Pump | 1 |
| 4 | P-2203 A/B | Sump Pump | 2 |
| 5 | P-2103 A/B | Glycol Transfer Pump | 2 |
| 6 | P-2102 | Glycol Manual Pump | 1 |

1. **reference / ATTACHED DOCUMENTS**
2. Specified documents in attachment 1 shall be considered as a part of this material Requisition.
3. All codes and standards which have been referenced in above mentioned specs shall be considered.
4. 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.
5. Deviations

Any exceptions/clarifications to codes/standards and specifications listed in attachment 1 must be clearly stated in a separate dedicated section of the proposal in the format submitted in attachment 3.

The proposed deviations/comments list shall include as minimum:

* Reference for the involved specification, chapter and paragraph.
* Technical justification for the non-compliance.
* Detailed description of the proposed alternative.

If no exceptions or clarifications exist, either for the complete referenced document or an individual paragraph, the vendor shall be considered to be in full compliance with the relevant document.

The vendor may propose materials of equivalent or better quality compared to those indicated in the equipment data sheet. Even these cases shall be duly included/technically supported in the deviations/clarifications list.

1. **SUBJECT OF THE SUPPLY**

The vendor shall supply centrifugal pumps each one shall be driven by an electromotor completely assembled and tested. The scope of supply is detailed at para. 5. The vendor shall include in the supply, all other equipment/devices/items not listed in the following, but necessary for a good design and a safe operation, taking into account process data and installation conditions such as area classification and climatic conditions.

The grade of shop assembly of the equipment/devices/items supplied shall be at maximum extent to facilitate site erection and pre-commissioning activities.

1. **LIMITS OF SUPPLY**
   1. **scope of supply**

### main description

* + The scope of supply is detailed below
* Centrifugal Pumps
* appropriate seal system according to its data sheets including all the relevant accessories
* Baseplate common (according to API 686) for each pump train incl. pump, driver, gearbox (If any), seals and sealing systems, coupling with guard and other auxiliary systems (mounted by vendor at shop)
* Coupling (dry flexible spacer with spark proof guard)
* Electrical motor for each pump with terminal boxes and accessories incl. anti-condensation heater, RTD’s and etc. (if applicable)
* On-skid cabling, tray and fittings
* Outdoor MCC for Auxiliaries Electrical Load (if any)
* All motor junction boxes complete with necessary terminals
* Instrumentation including junction box, wiring from instruments to the junction box and manifolds for pressure instruments
* Earthing lugs and material
* All necessary lifting lugs
* Valved casing drain & vent (for horizontal items)
* Gasket, bolts and nuts for on-vessel items
* Foundation bolts and nuts (anchor bolt), skid leveling screws, shims, sub-plates
* Any other accessories and auxiliaries specify in data sheet
* First fill of oil / grease
* Cooling plan with all required piping, valves instruments and etc. routed to the edge of skid
* Charging device for nitrogen and trolley mobile charging unit for all seal pots.
* Barrier filling device
* Suction strainer for vertical pumps
* All necessary accessories for utility distribution
* Name plates
* Thermal insulation jacket (if needed)
* Insulation clip and supports for line and equipment
* Clip and supports required for equipment fire proofing (if required)
* Sun protection facilities
* Special tools for erection and maintenance
* Spare Parts for erection, pre-commissioning, commissioning and start up and two years operation.
* Capital spare parts (as option)
* All requirements for safe and easy start up of pumps
* Any other items not listed above which are necessary for satisfactory design and operation of the pump shall be furnished by vendor.

### Engineering Services

The vendor shall assume overall responsibility for the design, manufacture, assembly, test and performance of all equipment/devices/items supplied as indicated in this requisition. This shall include, but not be limited to:

* Resolve engineering issues relating to equipment/devices/items within the scope of supply.
* Provide detailed design and documentation of all equipment/devices/items and components within the scope of supply in accordance with attachment 2 of this document.
* Provide all necessary information documents in order to allow the contractor to erect, install and verify the proposed equipment/devices/items.
* Implement a quality assurance plan
* The quality plan applied to the scope of supply shall include:
  + QA/QC Organization Chart and procedures that shall be submitted for approval.
  + Plan for HOLD points in the production process proposed to PURCHASER for witness or approval particular activities.
  + Production schedule indicating main quality manufacturing processes, inspection and tests.
  + Qualification of all personnel performing tests to be reviewed by the inspector
  + Vendor shall also provide the description of the following quality activities:
* Sub vendor s products quality
* Quality check and identification of the materials and equipment entering in their manufacturing shop.
* Calibration of test instruments and equipment
* Provide detailed specifications and data sheets.

### Spare parts

Following items shall be considered (supplied) and included in the bid documentation:

* Spare parts for commissioning and start-up; a qualified and complete list based on PROJECT SPARE PART SUPPLY PROCEDURE (Doc. No. E&C-QC-SP-1).
* Spare parts for two years operation; a qualified and complete list based on PROJECT SPARE PART SUPPLY PROCEDURE (Doc. No. E&C-QC-SP-1).
* Capital spare parts (as option / if any)

### Other items

* Special tools required for installation and maintenance
* Noise acoustic protection and relevant ancillaries in order to match with max. noise level requirements (if necessary)
* Name plate
* Earthing plate
* Painting of all items in accordance with "Painting Specification".
* Preparation for shipment
* Packing for sea freight transportation
* Shop inspections and testing as per specifications & data sheets
* Free access to manufacturing plants for the PURCHASER's inspectors
* Certificates or declarations of conformance (as required) of all Ex-equipment.
* Daily rate for erection supervision (separate price)
* Daily rate for commissioning and start-up supervision (separate price)
* Training for customer's personnel (separate price)
* KOM
* Technical/Clarification meeting
* Pre-Inspection Meeting

## SCOPE OF WORK

* Engineering and Documentation
* Manufacturing and assembling
* Mechanical Guarantee
* Performance Guarantee
* Sub-Vendor Coordination
* Mounting of main driver and auxiliary driver on baseplate at shop
* Inspection and testing at shop
* Piping within the Pump Package, all on skid piping/tubing with supports and all required fitting, valves, instruments and etc. on them. All on skid piping / tubing to be supplied by vendor and installed by him at shop
* All drains and vents piping routed to the edge of skid with block valves, manifold piping and blind flanges.
* Painting
* Prime Coats at Shop
* Finish Coats at Shop
* Packing Preservation suitable for more than 18 months at outdoor conditions of the site environment
* Packing including suitable protection for both sea transport and road transport on rough tracks
* Rust prevention for long term (over 6 month)
* Shipping and transportation to point of delivery (according to delivery condition)
* Supervision for installation (Per diem rate and/or lump sum - as an option)
* Supervision for erection, commissioning and start up (Per Diem rate and/or lump sum -as an option)
* Preparing of Final Book (Data Book)
  1. **Exclusions**

The following items are excluded by the vendor scope of supply and will be provided by purchaser:

* Concrete foundation (which shall be anyway designed based on vendor 's technical data)
* Instrument air supply
* Nitrogen supply (if any)
* Electrical supply
* Interconnecting power cables among each skid mounted terminal boxes and remote switch gear
* Interconnecting cabling, serial link, between the remotely mounted unit control panel and the process control system in the main control room
* Connection to plant earthing system
* Transport from receiving port to site
* Shelter for Pumps
* Site erection
* Lubricants (except first filling)
  1. **Battery Limits**

The battery limits are summarized as follows:

a) Process Gas

* + Inlet and outlet flanges on pump skid

b) Instrumentation and control

* + terminal strips inside junction boxes at skid edges

c) Electrical

* + Electrical equipment terminal boxes on skids
  + Incoming Power Supply of AC or DC UPS (if Any)
  + Earth Bosses on Skids.

d) Vents and Drains

* + Drain flanges manifold
  + Outlet vent piping flanges

1. **INSPECTION AND TESTS**

The equipment shall be inspected and tested in accordance with the Inspection &Test plan (ITP) issued by the vendor and approved by the CLIENT and EPC/EPD CONTRACTOR before the award of the order . The Inspection & Test plan (ITP) shall be at least according to the Commodity Procurement and Manufacturing Inspection Instruction (Docs .Nos. ICE-EID-MI-SP01-Rev01), Inspection Level of Commodity and Equipment (Docs .Nos. ICE-EID-MI-SP02-Rev01) and Data Sheets. The vendor shall in any case conduct all the tests required by contractual documents, specifications, codes and standards, manufacturer standard quality system and keep the relevant documentation. All required manufacturing and function test/inspection also Factory Acceptance Test /Site Acceptance Test and Quality Assurance requirements shall be considered in vendor responsibility as per project specification.

1. **VENDOR DOCUMENTATION REQUIREMENTS & SCHEDULE**

* Vendor shall prepare and submit all of required documents as per relevant “Vendor Data” section of relevant reference standard (ISO 5199).
* As a minimum Vendor document shall be according to attachment 2 of this document.
* All documents, preliminary or final, are to be stamped and signed by the vendor.
* Failure in dispatch of the required documents shall cause the supply to be considered as unfulfilled.
* PURCHASER’s approval does not relieve vendor, in any way, from his obligation to fulfill the requirements of the purchase order documents.
* All vendor drawings and documents shall be in English language.
* ITP, QCP, MPS documents shall be presented at the PIM by vendor

All drawings and documents are to be identified as per clause 1 **“GENERAL DEFINITION”**

1. **UNIT RESPONSIBILITY**

VENDOR shall be responsible for the design, engineering, co-ordination, supply, delivery, testing, final check-out and satisfactory operation of the equipment/devices/items. The engineering coordination also includes responsibility for handing and expediting drawings.

Also VENDOR shall be responsible for ensuring that all relevant information and documentation is passed on the sub-vendors.

1. **GUARANTEE AND WARRANTY**

All material and Equipment/Devices/Items in VENDOR’s scope of work/supply shall be guaranteed by VENDOR. The guarantee period shall be eighteen (18) months from the date of delivery and/or twelve (12) months from the installation date of each equipment/packages at site. VENDOR shall guarantee the performance of supplied items (if any). VENDOR shall guarantee that the Equipment/Device/Item is suitable for the operating conditions herein specified, and that all materials and components are free from any defects; verifications of all calculations are in VENDOR’s responsibility.

VENDOR shall unconditionally guarantee the materials and workmanship of all material and/or services. If, within the guarantee period, any defects occur which are due to faulty material and/or services included in his scope (design, manufacturing, inspection, testing, supply & etc.), VENDOR shall, at his own expense, repair or adjust the condition, or replace the material and/or services to the complete satisfaction of CLIENT’s representative. These repairs, replacement or adjustments shall be made only at such time as will be least detrimental to the operation of the CLIENT’s business.

VENDOR warrants promptly repairing or replacing the defective parts in the warranty period.

Vendor shall ensure a correct and safe operation of the unit, providing all safety protection Devices.

Vendor shall be responsible for the safe, reliable, continuous functioning of the Equipment/Devices/Items.

VENDOR is fully responsible for the design of package for correct and safe operation based on project requirement during package life time; therefore, VENDOR shall specify any documents/specifications which may be required for design, manufacture and finalizing of Equipment/Devices/Items to avoid any problems during the package operation at site before P.O; otherwise, VENDOR shall be hold responsible for any corresponding deviation from expectations from the Equipment/Devices/Items.

1. **DEVIATION**

VENDOR’s proposal shall be prepared in strict compliance with the requirements set forth in the relevant specifications of tender documents.

VENDOR shall include in his proposal the statement of compliance with the tender documents should VENDOR wish to submit exception to the requirements of tender documents. They shall be submitted for PURCHASER’s approval.

1. **PRICE BREAKDOWN**

Breakdown price of following items shall be included in the proposal, as well as total price.

1. Material and Fabrication for each Section Separately
2. Pre-commissioning & commissioning spare parts (E&C-QC-SP-1)
3. 2 years operational spare parts (E&C-QC-SP-1)
4. Capital spare parts
5. Packing & transportation
6. Other fee (if any)

# ATTACHMENT 1

D05

## LIST OF REFRENCE / APPLICABLE DOCUMENTS

| **No.** | **Document Title** | **Document No.** | **Rev.** |
| --- | --- | --- | --- |
| **Process** | | | |
|  | Process Basis of Design | BK-GNRAL-PEDCO-000-PR-DB-0001 | D08 |
|  | Process Design Criteria | BK-GNRAL-PEDCO-000-PR-DC-0001 | D02 |
|  | Symbol & Legend For PFD and P&ID | BK-GCS-PEDCO-120-PR-PI-0001 | D04 |
|  | P&ID - Diesel Oil System | BK-GCS-PEDCO-120-PR-PI-0023 | D08 |
|  | P&ID - Potable Water System | BK-GCS-PEDCO-120-PR-PI-0024 | D08 |
|  | P&ID -  Glycol Sump Drum | BK-GCS-PEDCO-120-PR-PI-0025 | D09 |
|  | P&ID - Close Drain System | BK-GCS-PEDCO-120-PR-PI-0017 | D09 |
|  | P&ID – Lean Glycol Storage Tank | BK-GCS-PEDCO-120-PR-PI-0014 | D09 |
|  | Process Data Sheets For Potable Water Pump | BK-GCS-PEDCO-120-PR-DT-0026 | D04 |
|  | Process Data Sheets For Diesel Pump | BK-GCS-PEDCO-120-PR-DT-0029 | D05 |
|  | Process Data Sheets For Glycol Drain Pump | BK-GCS-PEDCO-120-PR-DT-0028 | D04 |
|  | Process Data Sheets For Sump Pump | BK-GCS-PEDCO-120-PR-DT-0024 | D03 |
|  | Process Data Sheets For Glycol Transfer Pump | BK-GCS-PEDCO-120-PR-DT-0021 | D04 |
|  | Process Data Sheets For Glycol Manual Pump | BK-GCS-PEDCO-120-PR-DT-0022 | D04 |
|  | Utility Flow Diagrams (UFD) | BK-GCS-PEDCO-120-PR-UF-0001 | D05 |
|  | Calculation Note for Pumps | BK-GCS-PEDCO-120-PR-CN-0001 | D07 |
| **Mechanical** | | | |
|  | Mechanical Design Criteria | BK-GNRAL-PEDCO-000-ME-DC-0001 | D04 |
|  | Specification For Centrifugal Pumps for General Services | BK-GCS-PEDCO-120-ME-SP-0004 | D03 |
|  | Mechanical Data Sheets For Potable Water Pump | BK-GCS-PEDCO-120-ME-DT-0025 | D06 |
|  | Mechanical Data Sheets For Diesel Pump | BK-GCS-PEDCO-120-ME-DT-0026 | D06 |
|  | Mechanical Data Sheets For Glycol Drain Pump | BK-GCS-PEDCO-120-ME-DT-0035 | D04 |
|  | Mechanical Data Sheets For Sump Pump | BK-GCS-PEDCO-120-ME-DT-0023 | D05 |
|  | Mechanical Data Sheets For Glycol Transfer Pumps | BK-GCS-PEDCO-120-ME-DT-0020 | D05 |
|  | Mechanical Data Sheets For Glycol Manual Pump | BK-GCS-PEDCO-120-ME-DT-0021 | D05 |
| **Piping & Material** | | | |
|  | Piping Material Specification | BK-GCS-PEDCO-120-PI-SP-0001 | D06 |
|  | Specification For Fittings, Flanges, Gaskets and Bolts | BK-GNRAL-PEDCO-000-PI-SP-0005 | D02 |
|  | Specification For Painting | BK-GNRAL-PEDCO-000-PI-SP-0006 | D04 |
|  | Specification For Insulation | BK-GNRAL-PEDCO-000-PI-SP-0019 | D02 |
|  | Specification For Manual Valves | BK-GNRAL-PEDCO-000-PI-SP-0009 | D01 |
|  | Specification For Welding of Plant Piping System | BK-GNRAL-PEDCO-000-PI-SP-0011 | D02 |
|  | Piping Design Criteria | BK-GNRAL-PEDCO-000-PI-DC-0001 | D03 |
|  | Specification For the Design of Piping in Mechanical Packages | BK-GNRAL-PEDCO-000-PI-SP-0003 | D02 |
|  | Specification For Lining (Internal Protection of Equipment by Painting) | BK-GNRAL-PEDCO-000-PI-SP-0007 | D03 |
|  | Specification For Piping Cleaning and Flushing | BK-GNRAL-PEDCO-000-PI-SP-0017 | D03 |
|  | Piping Corrosion Study & Material Selection Report | BK-GCS-PEDCO-120-PI-RT-0001 | D05 |
|  | NDT Plan For steel Structures | BK-GNRAL-PEDCO-000-QC-PR-0041 | D00 |
|  | Specification For Material Requirements in Sour service | BK-GNRAL-PEDCO-000-PI-SP-0008 | D02 |
|  | Specification For Metallic Pipes | BK-GNRAL-PEDCO-000-PI-SP-0004 | D06 |
|  | Specification For Color Coding and Marking | BK-GNRAL-PEDCO-000-PI-SP-0001 | D02 |
|  | Specification For Plant Piping Systems Pressure Testing | BK-GNRAL-PEDCO-000-PI-SP-0010 | D03 |
| **Structure** | | | |
|  | Structural Design Criteria | BK-GNRAL-PEDCO-000-ST-DC-0001 | D02 |
|  | Standard Drawing For Anchor Bolts | BK-GNRAL-PEDCO-000-ST-DW-0002 | D02 |
| **Control & Instrumentation** | | | |
|  | Specification For Instrumentation | BK-GNRAL-PEDCO-000-IN-SP-0001 | D04 |
|  | Specification For Instrument and Control of package Unit System (PU) | BK-GNRAL-PEDCO-000-IN-SP-0004 | D02 |
|  | Specification For Instrument/F&G Cables | BK-GNRAL-PEDCO-000-IN-SP-0010 | D02 |
| **Electrical** | | | |
|  | Electrical System Design Criteria | BK-GNRAL-PEDCO-000-EL-DC-0001 | D02 |
|  | Specification For LV Switchgear & Motor Control Centers | BK-GNRAL-PEDCO-000-EL-SP-0001 | D03 |
|  | Specification For LV Induction Motors | BK-GNRAL-PEDCO-000-EL-SP-0010 | D03 |
|  | Specification For MV Induction Motors | BK-GNRAL-PEDCO-000-EL-SP-0017 | D03 |
|  | Specification For Electrical Requirements of Packaged Units | BK-GNRAL-PEDCO-000-EL-SP-0011 | D03 |
|  | Data Sheets For LV Induction Motors | BK-GCS-PEDCO-120-EL-DT-0008 | D03 |
|  | Data Sheets For MV Induction Motors | BK-GCS-PEDCO-120-EL-DT-0009 | D03 |
| **Safety & Fire Fighting** | | | |
|  | Specification For Hazardous Area Classification | BK-GNRAL-PEDCO-000-SA-SP-0002 | D03 |
|  | Hazardous Area Classification Layout | BK-GCS-PEDCO-120-SA-PY-0002 | D02 |
| **General** | | | |
|  | دستورالعمل بازرسی، خرید و ساخت کالا | ICE-EID-MI-SP01 | D01 |
|  | دستورالعمل تامین قطعات یدکی راه اندازی وراهبری دو سالانه | E&C-QC-SP-1 | D01 |
|  | دستورالعمل انتخاب سطح بازرسي كالا و تجهيزات | ICE-EID-MI-SP02-REV-01 | D01 |
|  | Specification For Final Data Book (FDB) Requirements | BK-GNRAL-PEDCO-000-QC-PR-0022 | D00 |
|  | Packing, Marking, Transportation Procedure | BK-GNRAL-PEDCO-000-QC-PR-0045 | D00 |

**ATTACHMENT 2**

## VENDOR DOCUMENTS MIN. REQUIREMENT

| **Item No.** | **Document** | **With Bid** | **TIME SCHEDULE** | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **For Review** | | **Final Issue** | |
| **Copies**  **No./Type**  **(7)** | **Copies**  **No./Type (1)** | **Solar**  **days**  **(2)** | **Copies**  **No./Type (1)** | **Calendar days**  **(3)** |
| **MANAGEMENT** | | | | | | |
|  | Vendor Document Index and Schedule  (Deleted) | 4N | 6C+E |  | 6C+E |  |
|  | Organization Brief | 3N | 6C+E |  |  |  |
|  | Schedule Level 1, 2, 3 & 4 showing Engineering, Procurement, Fabrication, Inspection, Testing, and Delivery Plan. | 4N | 6C+E |  | 6C+E |  |
|  | Physically Progress Report (Every 2 Weeks)) |  | 6C+E |  |  |  |
|  | Project Organization Chart | 3N | 6C+E |  |  |  |
|  | Reference List | 3N |  |  |  |  |
|  | Vendor Catalogue | 3N |  |  |  |  |
| **QUALITY** | | | | | | |
|  | Quality Assurance Manual /Quality Management System Certificate (according to latest rev. of ISO) | 4N |  |  | 6C+E |  |
|  | Preliminary Inspection and Test Plan | 4N |  |  |  |  |
|  | Inspection and Test Plan |  | 6C+E |  | 6C+E |  |
| **HSE** | | | | | | |
|  | HSE Procedure |  | 6C+E |  | 6C+E |  |
|  | Noise & Vibrations Calculations / Reports (If any) |  | 6C+E |  | 6C+E |  |
| **INTERFACE** | | | | | | |
|  | Electrical & Instrumentation Cable Schedule (for all systems) |  | 6C+E |  | 6C+E |  |
|  | Electrical & Instrumentation Wiring Drawings (for all systems) |  | 6C+E |  | 6C+E |  |
|  | Pump Data Sheets | 4N | 6C+E |  | 6C+E |  |
|  | Reliability, Availability, Maintainability Calculations/Reports | 4N | 6C+E |  | 6C+E |  |
|  | Performance Curves |  | 6C+E |  | 6C+E |  |
|  | PFD's | 4N | 6C+E |  | 6C+E |  |
|  | Functional Description |  | 6C+E |  | 6C+E |  |
|  | General Arrangements Drawings | 4N | 6C+E |  | 6C+E |  |
|  | Mechanical Equipment List | 3N | 6C+E |  | 6C+E |  |
|  | Electrical Equipment List | 3N | 6C+E |  | 6C+E |  |
|  | Control, Instrument & Cable List |  | 6C+E |  | 6C+E |  |
|  | Interface Block Diagrams | 3N | 6C+E |  | 6C+E |  |
|  | Junction Box, Local Panels & Cabinets: wiring diagrams & termination drawings |  | 6C+E |  | 6C+E |  |
|  | Functional Logic Diagram |  | 6C+E |  | 6C+E |  |
|  | P & ID's | 3N | 6C+E |  | 6C+E |  |
|  | Utility Consumption List | 3N | 6C+E |  | 6C+E |  |
|  | Power Supply Requirements | 3N | 6C+E |  | 6C+E |  |
|  | Single Line Diagram | 3N | 6C+E |  | 6C+E |  |
|  | Earthing Details | 3N | 6C+E |  | 6C+E |  |
|  | Weight / Centre of Gravity Drawings & Data's |  | 6C+E |  | 6C+E |  |
|  | External Static and Dynamic Forces & Moments (present during test, start-up, normal/maximum operation, shutdown, and other conditions of service) |  | 6C+E |  | 6C+E |  |
|  | Wind and Seismic Loads including shear and moment forces on supports and foundation. |  | 6C+E |  | 6C+E |  |
|  | Anchor Bolt Details Drawings (incl. size, type, locations relative to the equipment center-lines in three planes). |  | 6C+E |  | 6C+E |  |
|  | Ladder & Platform Detail Drawing |  | 6C+E |  | 6C+E |  |
|  | Steel Structure Detail Drawing |  | 6C+E |  | 6C+E |  |
| **ENGINEERING** | | | | | | |
|  | Detailed Functional Design Specification |  | 6C+E |  | 6C+E |  |
|  | Detailed Overall Description |  | 6C+E |  | 6C+E |  |
|  | Mechanical Detailed Specifications (one per component) |  | 6C+E |  | 6C+E |  |
|  | Detailed Design / Fabrication Drawings for Equipment & Auxiliary Parts |  | 6C+E |  | 6C+E |  |
|  | Cross Sectional Drawings with Part Lists |  | 6C+E |  | 6C+E |  |
|  | Assembly Drawings |  | 6C+E |  | 6C+E |  |
|  | Design Calculation Notes |  | 6C+E |  | 6C+E |  |
|  | Pressure Parts Calculations |  | 6C+E |  | 6C+E |  |
|  | Painting Operator Qualification Record |  | 6C+E |  | 6C+E |  |
|  | Piping Detailed Specifications (one per component) |  | 6C+E |  | 6C+E |  |
|  | Piping Routing |  | 6C+E |  | 6C+E |  |
|  | Valves & Instruments Location Drawings (incl. provisions for operational and maintenance access) |  | 6C+E |  | 6C+E |  |
|  | Electrical Detailed Specifications (one per component) |  | 6C+E |  | 6C+E |  |
|  | Electrical Cables Routing (incl. cable trays & junction boxes) |  | 6C+E |  | 6C+E |  |
|  | Electrical Equipment Location Drawings (incl. provisions for operational and maintenance access) |  | 6C+E |  | 6C+E |  |
|  | Protection Device Operating Curves |  | 6C+E |  | 6C+E |  |
|  | Electrical Control Schematics |  | 6C+E |  | 6C+E |  |
|  | Instrument & Control Detailed Specifications (one per component) |  | 6C+E |  | 6C+E |  |
|  | Instrument cables routing (incl. cable trays & junction boxes) |  | 6C+E |  | 6C+E |  |
|  | Instrument Equipment Location Drawings (incl. provisions for operational and maintenance access) |  | 6C+E |  | 6C+E |  |
|  | Hook-Up Diagrams |  | 6C+E |  | 6C+E |  |
|  | Wiring Loops Diagrams |  | 6C+E |  | 6C+E |  |
|  | Instrument Control Schematics |  | 6C+E |  | 6C+E |  |
|  | Instrument Mounting & Housing Instructions |  | 6C+E |  | 6C+E |  |
|  | Power Distribution & Consumption |  | 6C+E |  | 6C+E |  |
|  | Cause & Effect Charts |  | 6C+E |  | 6C+E |  |
|  | Original Software for Control & Monitoring System |  | 6C+E |  | 6C+E |  |
|  | Software System Specifications |  | 6C+E |  | 6C+E |  |
|  | Approximate Weight & Dimension | 4N |  |  |  |  |
|  | Shipping Detail Drawing |  | 6C+E |  | 6C+E |  |
|  | Final Data Book |  | 6C+E |  | 6C+E |  |
|  | Pressure Loss Calculations |  | 6C+E |  | 6C+E |  |
|  | Lubrication System Detailed Specifications / Drawings |  | 6C+E |  | 6C+E |  |
|  | Cooling System Detailed Specifications/Drawings |  | 6C+E |  | 6C+E |  |
|  | Shaft Sealing System Detailed Specifications/Drawings | 4N | 6C+E |  | 6C+E |  |
|  | Completed Equipment Datasheets | 4N | 6C+E |  | 6C+E |  |
|  | Calculation sheets for safety valves, control valves & orifice plate |  | 6C+E |  | 6C+E |  |
|  | Complex loop & automation descriptions, list of alarms & shutdown with set points |  | 6C+E |  | 6C+E |  |
|  | Electrical Equipment Catalogue | 3N | 6C+E |  | 6C+E |  |
|  | Electrical Interface Block Diagrams |  | 6C+E |  | 6C+E |  |
|  | Local Control Station of motors wiring diagram, termination drawing and general arrangement |  | 6C+E |  | 6C+E |  |
|  | Gear System Detailed Specifications / Drawings |  | 6C+E |  | 6C+E |  |
|  | Coupling System Detailed Specifications / Drawings |  | 6C+E |  | 6C+E |  |
| **PROCUREMENT** | | | | | | |
|  | List of Sub-Vendor s ( table giving: part of equipment, tag no., sub-vendor reference)(5.1.3) | 4N |  |  | 6C+E |  |
|  | Unpriced copy of sub-orders |  | 6C+E |  |  |  |
| **MANUFACTURING** | | | | | | |
|  | Weld and NDT Map |  | 6C+E |  | 6C+E |  |
|  | Surface Preparation and Painting Procedures |  | 6C+E |  | 6C+E |  |
|  | Heat Treatment Procedures |  | 6C+E |  | 6C+E |  |
|  | Welding Procedure Specification (including repair procedures). |  | 6C+E |  | 6C+E |  |
|  | Welder Qualification Procedure |  | 6C+E |  | 6C+E |  |
|  | Fabrication Degree | 3N |  |  |  |  |
| **TESTING** | | | | | | |
|  | Hydrostatic / Pneumatic Testing Procedure |  | 6C+E |  | 6C+E |  |
|  | Performance & Functional Test Procedure |  | 6C+E |  | 6C+E |  |
|  | Non-Destructive Testing/Examination Procedures |  | 6C+E |  | 6C+E |  |
|  | Factory Acceptance Test (FAT) Procedure |  | 6C+E |  | 6C+E |  |
|  | SAT Procedure |  | 6C+E |  | 6C+E |  |
| **RECORDS, REPORTS & CERTIFICATES** | | | | | | |
|  | Material Conformity Certificate |  | 6C+E |  | 6C+E |  |
|  | Testing Authority Approval Certificate (if any) |  | 6C+E |  | 6C+E |  |
|  | Hazardous Area Certificates. |  | 6C+E |  | 6C+E |  |
|  | Ingress Protection Certificate |  | 6C+E |  | 6C+E |  |
|  | Conformity Certificates (sub-vendor /equipment) |  | 6C+E |  | 6C+E |  |
|  | Material Certificates Identification Diagram. (cross-reference material location ; certificates for critical components) |  | 6C+E |  | 6C+E |  |
|  | Welding Procedure Qualification Record |  | 6C+E |  | 6C+E |  |
|  | Welder Qualification Records. |  | 6C+E |  | 6C+E |  |
|  | NDT Operator Qualifications |  | 6C+E |  | 6C+E |  |
|  | Detailed NDT Reports |  | 6C+E |  | 6C+E |  |
|  | Weld/ NDT Identification Diagram. (Cross-reference weld locations, WPS, welders, NDT reports). |  | 6C+E |  | 6C+E |  |
|  | Dimensional Control Reports |  | 6C+E |  | 6C+E |  |
|  | Hardness Test Reports |  | 6C+E |  | 6C+E |  |
|  | PWHT Charts & Reports, including calibration records of recorders (for each heat treatment) |  | 6C+E |  | 6C+E |  |
|  | Pressure Test Reports / Certificates |  | 6C+E |  | 6C+E |  |
|  | FAT Test Report / Certificates |  | 6C+E |  | 6C+E |  |
|  | Performance Test Report / Certificates |  | 6C+E |  | 6C+E |  |
|  | Noise & Vibration Test Report / Certificates |  | 6C+E |  | 6C+E |  |
|  | Electric Motor Type Test Report (if any) |  | 6C+E |  | 6C+E |  |
|  | Electric Motor Routine Test Report |  | 6C+E |  | 6C+E |  |
|  | Cable Continuity and Resistance Test Reports |  | 6C+E |  | 6C+E |  |
|  | Calibration Curves of Control Equipment |  | 6C+E |  | 6C+E |  |
|  | Calibration Test Certificates |  | 6C+E |  | 6C+E |  |
|  | Surface Preparation & Coating Reports |  | 6C+E |  | 6C+E |  |
|  | Hydrostatic / Pneumatic Testing Certificates |  | 6C+E |  | 6C+E |  |
|  | Welding Consumable Certificate |  | 6C+E |  | 6C+E |  |
|  | Inspection and Test Reports(if any) |  | 6C+E |  | 6C+E |  |
|  | Rust Prevention Report |  | 6C+E |  | 6C+E |  |
|  | Non-Conformities Report |  | 6C+E |  | 6C+E |  |
| **INSTALLATION** | | | | | | |
|  | Sub-Assembly Documentation |  | 6C+E |  | 6C+E |  |
|  | Sub-Assembly Drawings |  | 6C+E |  | 6C+E |  |
|  | Erection/Installation Manual (if required) |  | 6C+E |  | 6C+E |  |
|  | Name Plate Documents |  | 6C+E |  | 6C+E |  |
|  | Handling, Transportation & Storage Instructions |  | 6C+E |  | 6C+E |  |
|  | Unpacking & Inspection Instructions |  | 6C+E |  |  |  |
|  | Preliminary Packing List | 4N |  |  |  |  |
|  | Packing List |  | 6C+E |  | 6C+E |  |
| **OPERATION & MAINTENANCE** | | | | | | |
|  | Operating Instructions |  | 6C+E |  | 6C+E |  |
|  | Maintenance Instructions (if required) |  | 6C+E |  | 6C+E |  |
|  | Commissioning & Start-up Manual |  | 6C+E |  | 6C+E |  |
|  | List of Spare Parts Commissioning & Start-up | 4N | 6C+E |  | 6C+E |  |
|  | List of Spare Parts 2 Years Operation | 4N | 6C+E |  | 6C+E |  |
|  | List of Special Tools | 4N | 6C+E |  | 6C+E |  |
|  | Lube Oil Schedule |  | 6C+E |  | 6C+E |  |
|  | Software Manual (incl. Troubleshooting) |  | 6C+E |  | 6C+E |  |
|  | Consumables List |  | 6C+E |  | 6C+E |  |
|  | Function Test Procedure |  | 6C+E |  | 6C+E |  |
| **OTHERS** | | | | | | |
|  | All others documents (if required) will be listed in the order |  | 6C+E |  |  |  |
| NOTES:  (1) N= Number of document, C=Copy, E=Electronic Copy  (2) Starting from date of order placement  (3) Starting from reception of documentation without comments  (4) First issue of the document is subjected to the release of payment milestone as per purchase order  (5) Calendar days after reception of drive data  (6) Prior to testing  (7) One copy each bid copy  (8) List of Documents will be Finalized in VPIS | | | | | | |

# ATTACHMENT 3

## DEVIATIONS / EXCEPTIONS TO JOB SPECIFICATION

Requisition No.:

Description:

Equipment No.:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item No.** | **Description**  **of Proposed Exception** | **Recommended Revision to JOB SPECIFICATION** | **Reason for Proposed Exception** | **Effect on Base**  **PROPOSAL if CONTRACTOR Rejects Exception** |
|  |  |  |  |  |

# ATTACHMENT 4

## ALTERNATIVES TO JOB SPECIFICATION

Requisition No.:

Description:

Equipment No.:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item No.** | **Job Specification No. & Paragraph No.** | **Requirements of Job Specification** | **Description of Proposed Alternative** | **Reason for Proposed Alternative** |
|  |  |  |  |  |