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| **طرح نگهداشت و افزایش تولید 27 مخزن** |
| **TBE FOR LV SWITCHGEAR, MCC & LV CAPACITOR BANK****نگهداشت و افزایش تولید میدان نفتی بینک** |
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| D01 | Mar. 2025 | IFI | M.Fahimi | M.Fakharian | S.Faramarzpour |  |
| D00 | Nov. 2024 | IFI | M.Pourdasht | M.Fakharian | M.Sadeghian |  |
| **Rev.** | **Date** | **Purpose of Issue/Status** | **Prepared by:** | **Checked by:** | **Approved by:** | **Client Approval** |
| **Class:3** | **Client Doc. Number:** **F0Z-709330** |
| **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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| **14** | X | X |  |  |  | **64** |  |  |  |  |  |
| **15** | X | X |  |  |  | **65** |  |  |  |  |  |
| **16** | X | X |  |  |  | **66** |  |  |  |  |  |
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|  **TBE for LV Switchgear** |
| --- |
| **MR** | **PMR For LV Switchgear, MCC & LV Capacitor Bank** **(BK-GCS-PEDCO-120-EL-MR-0002)** | **Purchaser Requirement** | **Ista Noavaran Niroo** | **Status** | **Pars Tableau** | **Status** | **Taban Tablo Shargh** | **Status** | **Runin Sanat** | **Status** |
| **Item** | **Description** |
| 1. **General**
 |
|  | Name of Project / Plant | Binak Oilfield in Bushehr Province  | Confirmed  | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Reference Doc. | 1. IPS-M-EL-143(3)
2. LV Switchgear/MCC Single Line Diagram (BK-GCS-PEDCO-120-EL-SL-0002)
3. Specification For LV Switchgear & Motor Control Centers (BK-GNRAL-PEDCO-000-EL-SP-0001)
4. Electrical Typical Schematic Diagrams For LV Panel (BK-GCS-PEDCO-120-EL-DG-0002)
5. Electrical System Design Criteria (BK-GNRAL-PEDCO-000-EL-DC-0001)
6. Process Basis of Design (BK-GNRAL-PEDCO-000-PR-DB-0001)
 | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Manufacturer of Cubicles | By Vendor | Ista Noavaran Niroo Co | A | Pars Tableau | A | Taban Tablo Co | A | Runin Sanat Gostar | A |
|  | Manufacturer Type No./Country Origin | By Vendor | Sivacon 8PT / Siemens | A | Normabloc-Iran | A | Sivacon 8pt | A | Sivacon 8pt | C |
|  | Standard | IEC60439, IEC60947, IPS-M-EL-143(3) | IEC61439-1, IEC60947, IPS-M-EL-143(3) | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Type Of Cubicle - Fixed/ With draw able | With Draw Able | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Voltage & Variation | 400 VAC & ± 10% | 400 VAC & ± 5% | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Frequency & Variation | 50 HZ & ± 5% | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Service Voltage | 400 VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Number Of Phases | 3PH + PE + N | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Number of Cubicles (With Spare) | By Vendor | 18 | A | 21 | A | 26 | A | 20 | A |
|  | Number of Bus Sections | 3 | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Power Frequency (One Min) | 1.89 KV (ACC to Table 8 of IEC 61439-1) | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Impulse Withstand | 6 KV (ACC to Table G.1 of IEC 61439-1) | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Normal Current of Bus bars | 2000 A | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Short Current of Bus bars | 50 KA | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Peak Withstand Current | 125 KA | Based IEC 61439-1 Table 7 (Peakcurrent) is considered 105kA | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Short Time Duration | 1 SEC. | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | System Earthing | Solidly Earthed At Transformer Neutral Point | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Voltage of Control Circuit | Incoming/Tie: 110 VDCOutgoing: 230 VAC (by Isolation Transformer for each Cubicle, According to BK-GCS-PEDCO-120-EL-SL-0002 | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Incoming Feeder Signaling Circuit | 110 VDC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Motor & Heater Outgoing Feeder Signaling Circuit | 230 VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Distribution Outgoing Feeder Signaling Circuit | 230 VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Panel Light Auto. Door Micro Switch Operated | 230 VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Internal Safety Interlocks | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
| 1. **Environmental Conditions (Process Basis Design, BK-GNRAL-PEDCO-000-PR-DB-0001)**
 |
|  | Installation | Indoor, Safe Area | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Max. Ambient Temperature | 52 °C | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Min. Ambient Temperature | 5 °C | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Relative Humidity (Max.) | 100% | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Climate | Corrosive, Hot Atmosphere | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Altitude Above Sea Level | 12.5 m | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
| 1. **Cubicle Construction**
 |
|  | Enclosure | Metal Clad | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Indoor / Outdoor | Indoor | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Type of Installation | Floor Standing | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Bus Bar Material | Hard Drown, High Conductivity Copper | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Main Bus Bar Insulation Material | Flame Retardant, Non Hygroscopic Insulation Material | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Bus Bar color | L1: Red , L2: Yellow , L3: Blue , N: Black | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Shape of Main Bus Bars | By Vendor | Based on Siemens Standard | A | Acc To Tech Offer | C | 2\*80\*10 Per phase | A | After contract | A |
|  | Neutral Bus Bar Cross Section | By Vendor | Based on Siemens Standard | A | Acc To Tech Offer | C | 1\*80\*10 | A | After contract | A |
|  | Type / Material of Main Bus Bar Supporting Insulators | By Vendor | Based on Siemens Standard | A | Acc To Tech Offer | C | 1\*80\*10 | A | After contract | A |
|  | Bus Bar Joints | Silver Plated | Confirmed | A | Confirmed | A | Tin plated (Main busbar, not onlyjoint) | C | Confirmed | A |
|  | Bus Bar Identification | By Vendor | Based on Siemens Standard | A | Acc To Tech Offer | C | Label | A | After contract | A |
|  | Bus Bar Arrangement (Single / Duplicate) | By Vendor | Based on Siemens Standard | A | Acc To Tech Offer | C | Duplicate | A | After contract | A |
|  | Phase Bus Bar Cross Section | By Vendor | Based on Siemens Standard | A | Acc To Tech Offer | C | 2\*80\*10 Per phase | A | After contract | A |
|  | Earth Bus Bar Cross Section | By Vendor | Based on Siemens Standard | A | Acc To Tech Offer | C | 1\*40\*10 | A | After contract | A |
|  | Bus bar Cooling Method | Air Natural | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rear / Front Access | Front Access | Rear Access (limited space in the switchgear room) | A | Confirmed | A | Rear Access (limited space in the switchgear room) | A | Confirmed | A |
|  | Incomings / Outgoings To/From The Switchgear (Bus-Duct/Cable) | Incomings: CableOutgoings: Cable | ConfirmedConfirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Top / Bottom Entry | Cable: Bottom | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Degree of Protection | IP42 | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Min. Cubicle Sheet & Door Thickness For Enclosure | 2 mm | Confirmed | A | Confirmed | A | 2 mm for body enclosure | C | Confirmed | A |
|  | Tropic Design | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Provision For Extension at Each End of Switchgear | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Paint Color Shade | Ral 7032 (Light Grey) | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Thickness of Paint Coating | 60 – 80 Micron | Confirmed | A | Confirmed | A | Confirmed | A | 80-120 Micron | A |
| 1. **Circuit Breaker (ACB)**
 |
|  | Manufacturer / Country | By Vendor | ABB/SIEMENS West Europe | A | Schneider | A | ABB | A | Schneider | A |
|  | Manufacturer Type No. | By Vendor | 3WL/3VA/Emax | A | NW/NT | A | Emax | A | NW/NT | A |
|  | Type Of Main CB (Air / Vacuum / Others) | Air | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | No. of Poles in Main ACB | 4 Pole | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Insulation Voltage | 1000 VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Operating Voltage | 400 VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Current | By Vendor, Based on Load List (BK-GCS-PEDCO-120-EL-LI-0001) | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Breaking Current \* | 50 KA | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Making Current \* | 125 KA | Based on IEC 61439-1 : 105kA | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | S/C Withstanding Time | 1 SEC. | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Closing Time | By Vendor | 5-10 s | A | Acc To Catalog | A | 5-10 s | A | After contract | C |
|  | Tripping Time | By Vendor | 40 ms | A | Acc To Catalog | A | 40 ms | A | After contract | C |
|  | Rated Electrical Life | By Vendor | 10000 | A | Acc To Catalog | A | 10000 | A | After contract | C |
|  | Power Consumption of Closing Coil | By Vendor | 5~10W | A | Acc To Catalog | A | 5~10W | A | After contract | C |
|  | Power Consumption of Tripping Coil | By Vendor | 5~10W | A | Acc To Catalog | A | 5~10W | A | After contract | C |
|  | Power Consumption of Spring Charging Motor | By Vendor | 60~90W | A | Acc To Catalog | A | 60~90W | A | After contract | C |
|  | Spring Charge Motor Voltage Supply | 110 VDC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | No. of Circuit Breaker Operating With Charged Spring | 5 | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Anti-Pumping Feature | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Shutters | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Additional Auxiliary Contacts | By Vendor | If Required | A | Acc To Catalog | A | By Aux Relay | A | Refer to technical proposal | A |
|  | Closed/Open Position Indication | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Charged/Discharged Spring Indication | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
| 1. **MCCB**
 |
|  | Manufacturer of MCCB | By Vendor | ABB/SIEMENS west Europe | A | Schneider | A | ABB | A | Schneider | A |
|  | Rated Insulation Voltage | 1000 VAC | 690/1000 VAC | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Operating Voltage | 400 VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Current | According to “BK-GCS-PEDCO-120-EL-SL-0002” | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | NO. of Poles | 3 Pole | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
| 1. **MPCB**
 |
|  | Manufacturer of Switch-Fuse | By Vendor | SIEMENS /ABB | A | Schneider | A | ABB  | A | Schneider | A |
|  | Rated Insulation Voltage | 1000 VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Operating Voltage | 400 VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Current | According to “BK-GCS-PEDCO-120-EL-SL-0002” | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | NO. of Poles | 3 Pole | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
| 1. **Contactor**
 |
|  | Manufacturer Country | By Vendor | ABB/Siemens | A | Schneider | A | ABB  | A | Schneider | A |
|  | Manufacturer Type No. | By Vendor | 3RT/AF | A | LC | A | AC3 | A | LC1D | A |
|  | Type of Contactor (Air / Vacuum) | Air/AC3 | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Insulation Voltage | 1000 VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Operating Voltage | 400 VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Current | By Vendor, Based On SLD | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Closing Time | By Vendor | 4~70mS | A | Acc To Catalog | A | 4~70mS | A | After contract | A |
|  | Tripping Time | By Vendor | 3~5mS | A | Acc To Catalog | A | 3~5mS | A | After contract | A |
|  | Power Consumption of Elec. Bobbin | By Vendor | 2W | A | Acc To Catalog | A | 2W | A | After contract | A |
|  | Rated Electrical Life | By Vendor | 15000 | A | Acc To Catalog | A | 15000 | A | After contract | A |
|  | Rated Short Circuit Life | By Vendor | 20000 | A | Acc To Catalog | A | 20000 | A | After contract | A |
|  | Elect. Bobbin Voltage Supply | 230 VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Utilization Category | By Vendor | AC3 | A | AC3 | A | AC3 | A | After contract | A |
|  | RC Element | Where Is Applicable | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | NO. of Poles | 3 Pole | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
| 1. **Thermal Relays**
 |
|  | Manufacturer Country | By Vendor | ABB/Siemens | A | Schneider | A | ABB | A | Schneider | A |
|  | Manufacturer Type No. | By Vendor | 3RB/RT | A | LRD | A | Thermal | A | LRD | A |
|  | Rated Operating Voltage | 400 VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Single Phasing Protection | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Thermal Relay Adjustable Range | By Vendor ( ACC to Coordination type 2 ), According to “BK-GCS-PEDCO-120-EL-SL-0002” | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Thermal Relay Reset Feature | Yes Via a Door Mounted Push-Button | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
| 1. **PT'S-FIXED TYPE**
 |
|  | Manufacturer Country | By Vendor | Zafar/ Azmoon Trans | A | Azmoon Trans | A | Azmoon Trans | A | Azmoon Trans | A |
|  | Rated Operating Voltage | 400/$\sqrt{3}$ VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Secondary Voltage | 110/$\sqrt{3}$ VAC , 230/$\sqrt{3}$ VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Accuracy Class | Measuring : 1Protection : 3P | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Burden | By Vendor | 5 VA | A | 20 VA | A | 15 VA | A | 50 VA | A |
|  | Single-Phase / Three-Phase | 3 Phase | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Voltage Factor | By Vendor | At detail stage | A | Acc To Catalog | A | 230 | A | After contract | A |
| 1. **CTs**
 |
|  | Manufacturer Country | By Vendor | Mag Electric | A | Mag Electric | A | Mag Electric | A | Novin Harris | C |
|  | Rated Operating Voltage | 400 VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Primary Current | By Vendor, Based on SLD | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Secondary Current | 1 A | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Insulation Class | By Vendor | E | A | F | A | F | A | F | A |
|  | Accuracy Class | Measuring: 1Protection: 5P10 | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
| 1. **Protection**
 |
|  | Manufacturer Country | By Vendor | Siemens | A | Schneider | A | Schneider | A | Schneider | A |
|  | Manufacturer Designation No. | By Vendor | Reyrolle | A | Eassergy | A | Eassergy | A | Eassergy | A |
|  | Type of Protection Relays For Incomers/Tie | Multi-Function, Microprocessor Based | 7SR | A | P3 | A | P3 | A | P3 | A |
|  | No. of Contacts | MIN. 4 | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Contact Rating Current | 5 A | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Auto Diagnostic & Self Supervision | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Serial Link Communication Port | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
| 1. **Measuring & Control System**
 |
|  | Manufacturer of Indicators / Country | By Vendor | Ziegler | A | Schneider | A | Schneider | A | BEW | C |
|  | Accuracy Class Of Indicators | CL.1 | Confirmed | A | Confirmed | A | Confirmed | A | 1.5 | C |
|  | Manufacturer of Selector Switch | By Vendor | TRS | A | KAVEH | A | Trs / Raad | A | Schneider | A |
|  | Manufacturer of Push Buttons | By Vendor | Schneider/Raad | A | Schneider | A | Raad | C | Schneider | A |
|  | Manufacturer of Indication Lamps | By Vendor | Schneider/Raad | A | Schneider | A | Raad | C | Schneider | A |
|  | Manufacturer of Terminals | By Vendor | Raad | A | Raad | A | Raad | A | Raad | A |
|  | Manufacturer of AUX. Relays | By Vendor | Omron | A | Weidmueller | A | Omron | A | Weidmueller | A |
|  | Remote Control Indication / Alarm / Inter trip / ETC. | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Mimic Diagram | Not Applicable | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Size of Control Wiring | 2.5 mm2 for CT'S1.5 mm2 for Other | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Ammeter / Voltmeter Manufacture | By Vendor | Ziegler | A | BEW | C | BEW | C | BEW | C |
|  | Ammeter / Voltmeter Class | CL.1 | CL: 1.5 | C | Confirmed | A | Confirmed | A | 1.5 | C |
|  | Ammeter / Voltmeter range | According to “BK-GCS-PEDCO-120-EL-SL-0002” | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Multi Meters Manufacture | By Vendor | Schneider | A | Schneider | A | DM6200 Schneider | A | Schneider | A |
|  | Multi Meters Class | CL.0.5 | Confirmed | A | Confirmed | A | Confirmed | A | 1 | C |
| 1. **Miscellaneous**
 |
|  | Routine Tests Foreseen | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Type Tests Foreseen | No, If Certified | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Two Years Op. & Comis. Spare Parts Proposed | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Special Tools | Yes, If Required | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Accessories | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Mimic Diagram for Each Cubicle | Yes for Incoming | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Dimension of One Cubicle (H X W X D) | By Vendor | Acc. to arrangement layout based on front or rear access | A | Acc. to arrangement layout based on front or rear access | A | Acc. to arrangement layout based on front or rear access | A | Acc. to arrangement layout based on front or rear access | A |
|  | Overall Dimension (H X W X D) | By Vendor | After Detail Desig | A | Acc. to arrangement layout based on front or rear access | A | Acc. to arrangement layout based on front or rear access | A | Acc. to arrangement layout based on front or rear access | A |
|  | Weight of One Cubicle | By Vendor | 250~320 Kg per cel | A | 250~320 Kg per cel | A | 250~320 Kg per cel | A | 250~320 Kg per cel | A |
|  | Total Weight of Cubicles | By Vendor | After Detail Desig | A | After Detail Desig | A | After Detail Desig | A | After Detail Desig | A |
|  | Time Schedule Prepared | By Vendor | Based on Offer | A | Confirmed | A | After P.O | A | After contract | A |
|  | Delivery Time | By Vendor | 120 Day | A | Confirmed | C | 3months | A | After contract | C |
|  | Any Deviations From Spec. | By Vendor |  Based on Offer | C | Confirmed | C | As Attached | C | Refer To Technical Proposal | C |
| 1. **Accessories**
 |
|  | Illumination (Y/N) | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Lifting Lugs (Y/N) | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Space Heater With Thermostat (Y/N) | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | C.B. Position Indicator | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Door Key (Y/N) | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | C.B. Charging / Retracting (Y/N) | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Voltage and Current Test Block for Protection Relays (Y/N) | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Lamp Test Facility (Y/N) | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Based On SLD | C |
|  | Automatic Shutter (Y/N) | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Floor Frame (Y/N) | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | C.B. Transfer Trolley (Y/N) | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Name Plate & Front Tag & Rear Side Tag (Y/N) | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Telescopic Rotary Handle for MCCB(Y/N)  | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
| 1. **Mechanical Interlock**
 |
|  | Door Shall Not Able To Open When C.B. Is Closed | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Impossibility of C.B. Rack-In / Rack-Out When C.B. Is Closed | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Padlock for C.B. | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | MCCB Open / Close From Closed Door Through Lockable Telescopic Rotary Handle | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
| 1. **Panel Space Heater Technical Data**
 |
|  | Voltage | 230 VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Power Consumption | By Vendor | 100 W | A | 80 W | A | 100W | A | 60 W | A |
| 1. **Panel Light Technical Data**
 |
|  | Type No. | By Vendor | LED | A | LED | A | LED | A | LED | A |
|  | Voltage | 230 VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Power Consumption | By Vendor | 8 W | A | 5 W | A | 8 W | A | 5 W | A |

**Status Legends:**

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N/A=Not Applicable

INA=Information Not Available

C=Clarification is Required

CA= Conditionally Acceptable

M = Requirement is Mandatory

|  |  | **TBE for LV Capacitor Bank** |
| --- | --- | --- |
| **MR** | **PMR For LV Switchgear, MCC & LV Capacitor Bank** **(BK-GCS-PEDCO-120-EL-MR-0002)** | **Purchaser Requirement** | **Ista Noavaran Niroo** | **Status** | **Pars Tableau** | **Status** | **Taban Tablo Shargh** | **Status** | **Runnin Sanat** | **Status** |
| **Item** | **Description** |
| 1. **General Information**
 |
|  | Quantity | 1 Set for Each LV Switchgear (Note 2) | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Tag Numbers | CB01 & CB02 | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Applicable Standards | IEC 60831IPS-M-EL-181(2)IPS-M-EL-143(3) | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Applicable Document | BK-GNRAL-PEDCO-000-EL-SP-0012BK-GCS-PEDCO-120-EL-CN-0011BK-GNRAL-PEDCO-000-EL-SP-0001 | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Manufacturer's Name | By Vendor | Ista Noavaran Niroo Co | A | Pars Tableau | A | Taban Tablo | A | Runnin Sanat | A |
| 1. **Environmental Conditions (Process Basis Design, BK-GNRAL-PEDCO-000-PR-DB-0001)**
 |
|  | Location  | Binak Oilfield in Bushehr Province | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Hazardous Area Classification | Safe | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Max. Outdoor Ambient Temperature | 50°C | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Minimum Indoor Ambient Temp. | -5°C | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Maximum Indoor Relative Humidity | 100% | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Altitude (Above Sea Level) | 12.5 m | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Seismic Factor | Zone 3 | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Installation  | Indoor | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
| 1. **Electrical Data**
 |
|  | System Voltage | 400V AC ±10% | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | System Frequency | 50 Hz ±5% | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | No. of Phases | 3 | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Control Voltage | 230 VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Space Heater Voltage | 230 VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Bus-Bar Rated Current | 315A | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Short Time Withstand Current | 50 kA, 1 Sec. | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Bus-Bars Material | Heat Shrink Copper | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Bus-Bars Joints | Silver Plated | Confirmed | A | Confirmed | A | Tin plated (Main busbar, not onlyjoint) | A | Confirmed | A |
| 1. **Enclosure Data**
 |
|  | Enclosure Type | Free Standing/Fixed Type / Front Access | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Degree of Protection | IP 42 | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Cable Entry | Bottom (by Cable Gland) | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Type & Size of Power Cable | According to “BK-GCS-PEDCO-120-EL-CN-0003”( 4C×120 mm2 CU/XLPE/SWA/PVC ) | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Control Cable | 2×(5C× 4 mm2) for Current & Voltage Sample | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Material | Painted Sheet Steel | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Color | RAL 7032 | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Dimensions (HxWxD) | By Vendor | At detail stage | A | At detail stage | A | 2200\*800\*800 | A | At detail stage | A |
|  | Sheet Steel Thickness (Body/Frame) | 2mm/2.5mm | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Weight | By Vendor | 300 ~ 350 Kg | A | 300 ~ 350 Kg | A | 300 ~ 350 Kg | A | 300 ~ 350 Kg | A |
| 1. **Capacitors**
 |
|  | Capacitor Manufacturer/Model No./Year | By Vendor | PKC | A | Hydra | C | FARAKOH/; IFASA/SABAKHAZEN | A | Palayesh Nirou | A |
|  | Rating of each Capacitor Bank | 140Kvar = 1x20Kvar Fix+ 6x20Kvar | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Capacitor Bank Rated Current | By Vendor | At detail stage | A | At detail stage | A | At detail stage | A | At detail stage | A |
|  | Capacitor Bank Rated Voltage | 440V | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Capacitor Bank Connection Type | Delta | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Capacitor Unit Temp. Category | -5/D | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Capacitor Unit Case Material | Aluminum | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Capacitor Unit Discharge time (to 75V) | <3 Minutes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
| 1. **Control Unit (Regulator)**
 |
|  | Manufacturer / Type | By Vendor | PKC | A | PKC | A | Schneider | A | Palayesh Nirou | A |
|  | Mode of Operation | Automatic & Manual | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Number of Steps | 5 Steps | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Selector Switch | Auto/Off/ManualSelector Switch For Each Step | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
| 1. **Fuses**
 |
|  | Manufacturer / Type | By Vendor | ETI | A | Pichaz | A | Pichaz | A | ETI | A |
|  | Rated Current | 1.5 times of Capacitor Rated Current | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Inrush Current | 100 times of Capacitor Rated Current | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Voltage | 500V | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Service Voltage | 400V±10% | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Frequency | 50Hz±5% | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
| 1. **Contactors**
 |
|  | Manufacturer / Type | By Vendor | Siemens | A | Schneider | A | RK / LIFASA | A | schneider | A |
|  | Rated Voltage | 690V AC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Service Voltage | 400V AC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Coil Voltage | 230 VAC (Note 2) | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Duty | AC6-b | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
| 1. **Incoming Circuit Breaker**
 |
|  | Manufacturer / Type | By Vendor | ABB / Siemens | A | Schneider | A | ABB | A | schneider | A |
|  | Type | MCCB, 4Pole, Fixed Type | Confirmed | A | Confirmed | A | Confirmed | A | 3 Pole | A |
|  | Rated Current | 315A | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Short Circuit Breaking Current | 50 kA | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Insulation Voltage | 1000 VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Service Voltage | 400V | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Internal Protections | 49, 50, 51 | Confirmed | A | Confirmed | A | 49 & 50 | A | 49 & 50 | A |
|  | Voltage Protection | 230 VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Trip and Status aux. switches | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
| 1. **Voltmeter with Selector Switch**
 |
|  | Manufacturer / Type | By Vendor | Ziegler | A | BEW | C | Voltmeter: BEWSelectoe: TRS | C | BEW | C |
|  | Operating Range | 0 -500V | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Accuracy Class | 1.5 | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
| 1. **Accessories**
 |
|  | Panel Lighting & Space Heater with Thermostat/Hygrostat | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Door Key | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Gland Plate | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Terminal Lugs | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Commissioning Spare Parts | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Two Year Operation Spare Parts | Yes | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Routine Test | Witnessed and Report | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Type Test CERTIFICATE | Certificat | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
| 1. **Inrush Reactor**
 |
|  | Inrush Reactor Requied (Y/N) | By Vendor | PKC / Zafar / Azmoon | A | PKC | A | Farakoh | A | PKC | A |
|  | Inductance (mH) | By Vendor | At detail stage | A | At detail stage | A | At detail stage | A | At detail stage | A |
|  | Type | By Vendor | At detail stage | A | At detail stage | A | At detail stage | A | At detail stage | A |

**Status Legends:**

A=Acceptable

N=Not Acceptable

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M = Requirement is Mandatory

**Conclusion Table:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Item** | **Equipment** | **Ista Noavaran Niroo** | **Pars Tableau** | **Taban Tablo Shargh** | **Runin Sanat Gostar** |
| **1** | **LV MCC Switchgear** | Acceptable  | Acceptable  | Acceptable  | Acceptable  |
| **2** | **LV Capacitor Bank** | Acceptable | Acceptable  | Acceptable  | Acceptable  |

**Conclusion Note:**

1. The maximum design temperature of LV switchgear is 40 °C.
2. Protection relay is not acceptable on the C.B ( Built-in type ) , Protection relay shall be externally type.