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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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| **PAGE** | **D00** | **D01** | **D02** | **D03** | **D04** |  | **PAGE** | **D00** | **D01** | **D02** | **D03** | **D04** |
| **1** | X | X |  |  |  | **51** |  |  |  |  |  |
| **2** | X | X |  |  |  | **52** |  |  |  |  |  |
| **3** | X | X |  |  |  | **53** |  |  |  |  |  |
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| **12** | X | X |  |  |  | **62** |  |  |  |  |  |
| **13** | X | X |  |  |  | **63** |  |  |  |  |  |
| **14** | X | X |  |  |  | **64** |  |  |  |  |  |
| **15** | X | X |  |  |  | **65** |  |  |  |  |  |
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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 (Peak current) 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 VDC  Outgoing: 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 only  joint) | 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: Cable  Outgoings: Cable | Confirmed  Confirmed | 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/ VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Rated Secondary Voltage | 110/ VAC , 230/ VAC | Confirmed | A | Confirmed | A | Confirmed | A | Confirmed | A |
|  | Accuracy Class | Measuring : 1  Protection : 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: 1  Protection: 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'S  1.5 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:**

A=Acceptable

N=Not Acceptable

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 60831  IPS-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-0012  BK-GCS-PEDCO-120-EL-CN-0011  BK-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 only joint) | 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/Manual  Selector 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: BEW Selectoe: 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

N/A=Not Applicable

INA=Information Not Available

C=Clarification is Required

CA= Conditionally Acceptable

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.