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| **طرح نگهداشت و افزایش تولید 27 مخزن** |
| **DATA SHEETS FOR EXPANSION OF LV SWITCHGEAR IN SIAHMAKAN GAS INJECTION****نگهداشت و افزایش تولید میدان نفتی بینک** |
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| D00 | Sep.2022 | IFC | H.Shakiba | M.Fakharian | M.Mehrshad |  |
| **Rev.** | **Date** | **Purpose of Issue/Status** | **Prepared by:** | **Checked by:** | **Approved by:** | **CLIENT Approval** |
| **Class: 2** | **CLIENT Doc. Number: F0Z-708633** |
| **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** |
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| **2** | X |  |  |  |  | **52** |  |  |  |  |  |
| **3** | X |  |  |  |  | **53** |  |  |  |  |  |
| **4** | X |  |  |  |  | **54** |  |  |  |  |  |
| **5** | X |  |  |  |  | **55** |  |  |  |  |  |
| **6** | X |  |  |  |  | **56** |  |  |  |  |  |
| **7** | X |  |  |  |  | **57** |  |  |  |  |  |
| **8** | X |  |  |  |  | **58** |  |  |  |  |  |
| **9** | X |  |  |  |  | **59** |  |  |  |  |  |
| **10** | X |  |  |  |  | **60** |  |  |  |  |  |
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| **Technical Data Sheet For LV Switchgear In SIAHMAKAN Gas Injection** |
| --- |
| **ITEM** | **DESCRIPTION** | **REQUIREMENT** | **VENDOR'S DATA** |
| **1** | **GENERAL** |
|  | Name of Project / Plant | Binak Oilfield in Bushehr Province  |  |
|  | Reference Doc. | 1. IPS-M-EL-143(3)
2. LV Single Line Diagram For Expansion Of Upstream LV Switchgear in Siahmakan Gas Injection

(BK-PPL-PEDCO-320-EL-SL-0001)1. Specification For LV Switchgear & Motor Control Centers (BK-GNRAL-PEDCO-000-EL-SP-0001)
2. Electrical System Design Criteria

(BK-GNRAL-PEDCO-000-EL-DC-0001)1. Process Basis of Design

(BK-GNRAL-PEDCO-000-PR-DB-0001) |  |
|  | Manufacturer of Cubicles | By Vendor |  |
|  | Manufacturer Type No./Country Origin | By Vendor |  |
|  | Standard | IEC60439, IEC60947, IPS-M-EL-143(3) |  |
|  | Type Of Cubicle - Fixed/ With Draw Able | With Draw Able |  |
|  | Rated Voltage & Variation | 400 VAC & ± 10% |  |
|  | Rated Frequency & Variation | 50 HZ & ± 5% |  |
|  | Service Voltage | 400 VAC |  |
|  | Number Of Phases | 3PH + PE + N |  |
|  | Number of Cubicles (With Spare) | By Vendor |  |
|  | Number of Bus Sections | 3 |  |
|  | Power Frequency (One Min) | 1.89 KV (ACC to Table 8 of IEC 61439-1) |  |
|  | Impulse Withstand | 6 KV (ACC to Table G.1 of IEC 61439-1) |  |
|  | Rated Normal Current of Bus bars | 800 A |  |
|  | Rated Short Current of Bus bars | 50 KA |  |
|  | Rated Peak Withstand Current | 125 KA |  |
|  | Rated Short Time Duration | 1 Sec. |  |
|  | System Earthing | Solidly Earthed At Transformer Neutral Point |  |
|  | Voltage of Control Circuit | Incoming/Tie: 110 VDCOutgoing: 230 VAC (by Isolation Transformer for each Cubicle, According to BK-PPL-PEDCO-320-EL-SL-0001 |  |
|  | Incoming Feeder Signaling Circuit | 110 VDC |  |
|  | Motor & Heater Outgoing Feeder Signaling Circuit | 230 VAC |  |
|  | Distribution Outgoing Feeder Signaling Circuit | 230 VAC |  |
|  | Panel Light Auto. Door Micro Switch Operated | 230 VAC |  |
|  | Internal Safety Interlocks | Yes |  |
| **2** | **SITE CONDITION** |
|  | Installation | Indoor, Safe Area |  |
|  | Max. Ambient Temperature | 52 °C |  |
|  | Min. Ambient Temperature | 5 °C |  |
|  | Relative Humidity (Max.) | 100% |  |
|  | Climate | Corrosive, Hot Atmosphere |  |
|  | Altitude Above Sea Level | 12.5 m |  |
| **3** | **CUBICLE CONSTRUCTION** |
|  | Enclosure | Metal Clad |  |
|  | Indoor / Outdoor | Indoor |  |
|  | Type of Installation | Floor Standing |  |
|  | Bus Bar Material | Hard Drown, High Conductivity Copper |  |
|  | Main Bus Bar Insulation Material | Flame Retardant, Non Hygroscopic Insulation Material |  |
|  | Bus Bar color | L1: Red , L2: Yellow , L3: Blue , N: Black |  |
|  | Shape of Main Bus Bars | By Vendor |  |
|  | Neutral Bus Bar Cross Section | By Vendor |  |
|  | Type / Material of Main Bus Bar Supporting Insulators | By Vendor |  |
|  | Bus Bar Joints | Silver Plated |  |
|  | Bus Bar Identification | By Vendor |  |
|  | Bus Bar Arrangement (Single / Duplicate) | By Vendor |  |
|  | Phase Bus Bar Cross Section | By Vendor |  |
|  | Earth Bus Bar Cross Section | By Vendor |  |
|  | Bus bar Cooling Method | Air Natural |  |
|  | Rear / Front Access | Front Access |  |
|  | Incomings / Outgoings To/From The Switchgear (Bus-Duct/Cable) | Incomings: CableOutgoings: Cable |  |
|  | Top / Bottom Entry | Cable: Bottom |  |
|  | Degree of Protection | IP42 |  |
|  | Min. Cubicle Sheet & Door Thickness For Enclosure | 2 mm |  |
|  | Tropic Design | Yes |  |
|  | Provision For Extension at Each End of Switchgear | Yes |  |
|  | Paint Color Shade | Ral 7032 (Light Grey) |  |
|  | Thickness of Paint Coating | 60 – 80 Micron |  |
| **4** | **CIRCUIT BREAKER (ACB)** |
|  | Manufacturer / Country | By Vendor |  |
|  | Manufacturer Type No. | By Vendor |  |
|  | Type Of Main CB (Air / Vacuum / Others) | Air |  |
|  | No. of Poles in Main ACB | 4 Pole |  |
|  | Rated Insulation Voltage | 1000 VAC |  |
|  | Rated Operating Voltage | 400 VAC |  |
|  | Rated Current | By Vendor, Based on Load List (BK-PPL-PEDCO-320-EL-LI-0001) |  |
|  | Rated Breaking Current | 50 KA |  |
|  | Rated Making Current  | 125 KA |  |
|  | S/C Withstanding Time | 1 Sec. |  |
|  | Closing Time | By Vendor |  |
|  | Tripping Time | By Vendor |  |
|  | Rated Electrical Life | By Vendor |  |
|  | Rated Short Circuit Life | By Vendor |  |
|  | Power Consumption of Closing Coil | By Vendor |  |
|  | Power Consumption of Tripping Coil | By Vendor |  |
|  | Power Consumption of Spring Charging Motor | By Vendor |  |
|  | Spring Charge Motor Voltage Supply | 110 VDC |  |
|  | No. of Circuit Breaker Operating With Charged Spring | 5 |  |
|  | Anti-Pumping Feature | Yes |  |
|  | Shutters | Yes |  |
|  | Additional Auxiliary Contacts | By Vendor |  |
|  | Mechanical Operations Counter | By Vendor |  |
|  | Manual Mechanical Trip Facility | By Vendor |  |
|  | Closed/Open Position Indication | Yes |  |
|  | Charged/Discharged Spring Indication | Yes |  |
|  | No. of Make Contacts | By Vendor |  |
|  | No. of Break Contacts | By Vendor |  |
|  | Rated Current at Voltage (By Vendor) | By Vendor |  |
|  | Weight of One Unit | By Vendor |  |
| **5** | **MCCB** |
|  | Manufacturer of MCCB | By Vendor |  |
|  | Rated Insulation Voltage | 1000 VAC |  |
|  | Rated Operating Voltage | 400 VAC |  |
|  | Rated Current | According to “BK-PPL-PEDCO-320-EL-SL-0001” |  |
|  | NO. of Poles | According to “BK-PPL-PEDCO-320-EL-SL-0001” |  |
| **6** | **SWITCH-FUSE** |
|  | Manufacturer of Switch-Fuse | By Vendor |  |
|  | Rated Insulation Voltage | 1000 VAC |  |
|  | Rated Operating Voltage | 400 VAC |  |
|  | Rated Current | According to “BK-PPL-PEDCO-320-EL-SL-0001” |  |
|  | NO. of Poles | 3 Pole |  |
| **7** | **CONTACTOR** |
|  | Manufacturer Country | By Vendor |  |
|  | Manufacturer Type No. | By Vendor |  |
|  | Type of Contactor (Air / Vacuum) | Air/AC3 |  |
|  | Rated Insulation Voltage | 1000 VAC |  |
|  | Rated Operating Voltage | 400 VAC |  |
|  | Rated Current | By Vendor, Based On SLD |  |
|  | Closing Time | By Vendor |  |
|  | Tripping Time | By Vendor |  |
|  | Power Consumption of Elec. Bobbin | By Vendor |  |
|  | Rated Electrical Life | By Vendor |  |
|  | Rated Short Circuit Life | By Vendor |  |
|  | Elect. Bobbin Voltage Supply | 230 VAC |  |
|  | Utilization Category | By Vendor |  |
|  | RC Element | Where Is Applicable |  |
|  | Weight of One Unit | By Vendor |  |
|  | NO. of Poles | 3 Pole |  |
| **8** | **THERMAL RELAYS** |
|  | Manufacturer Country | By Vendor |  |
|  | Manufacturer Type No. | By Vendor |  |
|  | Rated Operating Voltage | 400 VAC |  |
|  | Single Phasing Protection | Yes |  |
|  | Thermal Relay Adjustable Range | By Vendor ( ACC to Coordination type 2 ), According to “BK-PPL-PEDCO-320-EL-SL-0001” |  |
|  | Thermal Relay Reset Feature | Yes Via a Door Mounted Push-Button |  |
| **9** | **PT'S-FIXED TYPE** |
|  | Manufacturer Country | By Vendor |  |
|  | Manufacturer Type No. | By Vendor |  |
|  | Rated Operating Voltage | 400/$\sqrt{3}$ VAC |  |
|  | Rated Secondery Voltage | 110/$\sqrt{3}$ VAC , 230/$\sqrt{3}$ VAC |  |
|  | Accuracy Class | Measuring : 1Protection : 3P |  |
|  | Burden | By Vendor |  |
|  | Single-Phase / Three-Phase | 3 Phase |  |
|  | Type of Construction | By Vendor |  |
|  | Rated Voltage Factor | By Vendor |  |
|  | Dimension (L X W X H) | By Vendor |  |
|  | Weight | By Vendor |  |
| **10** | **CTs** |
|  | Manufacturer Country | By Vendor |  |
|  | Manufacturer Type No. | By Vendor |  |
|  | Rated Operating Voltage | 400 VAC |  |
|  | Rated Primary Current | By Vendor, Based on SLD |  |
|  | Rated Secondary Current | 1 A |  |
|  | Insulation Class | By Vendor |  |
|  | Accuracy Class | Measuring: 1Protection: 5P10 |  |
|  | Max. Thermal Withstand Current | By Vendor |  |
|  | Burden | By Vendor |  |
|  | Type of Construction | Cast Resin |  |
|  | Type of Installation | FIX |  |
|  | Dimension (L X W X H) | By Vendor |  |
|  | Weight | By Vendor |  |
| **11** | **PROTECTION** |
|  | Manufacturer Country | By Vendor |  |
|  | Manufacturer Designation No. | By Vendor |  |
|  | Type of Protection Relays For Incomers/Tie | Multi-Function, Microprocessor Based |  |
|  | No. of Contacts | MIN. 4 |  |
|  | Contact Rating Current | 5 A |  |
|  | Auto Diagnostic & Self Supervision | Yes |  |
|  | Serial Link Communication Port | Yes |  |
| **12** | **MEASURING & CONTROL SYSTEM** |
|  | Manufacturer of Indicators / Country | By Vendor |  |
|  | Accuracy Class Of Indicators | CL.1 |  |
|  | Manufacturer of Selector Switch | By Vendor |  |
|  | Manufacturer of Push Buttons | By Vendor |  |
|  | Manufacturer of Indication Lamps | By Vendor |  |
|  | Manufacturer of Terminals | By Vendor |  |
|  | Manufacturer of AUX. Relays | By Vendor |  |
|  | Remote Control Indication / Alarm / Intertrip / ETC. | Yes |  |
|  | Mimic Diagram | Not Applicable |  |
|  | Size of Control Wiring | 2.5 mm2 for CT'S1.5 mm2 for Other |  |
|  | Ammeter / Voltmeter Manufacture | By Vendor |  |
|  | Ammeter / Voltmeter Class | CL.1 |  |
|  | Ammeter / Voltmeter range | According to “BK-PPL-PEDCO-320-EL-SL-0001” |  |
|  | Multi Meters Manufacture | By Vendor |  |
|  | Multi Meters Class | CL.0.5 |  |
|  | Transducer Model & Manufacturer | By Vendor |  |
| **13** | **MISCELLANEOUS** |
|  | Routine Tests Foreseen | Yes |  |
|  | Type Tests Foreseen | No, If Certified |  |
|  | Two Years Op. & Comis. Spare Parts Proposed | Yes |  |
|  | Special Tools | Yes, If Required |  |
|  | Accessories | Yes |  |
|  | Mimic Diagram for Each Cubicle | Yes for Incoming |  |
|  | Dimension of One Cubicle (H X W X D) | By Vendor |  |
|  | Overall Dimension (H X W X D) | By Vendor |  |
|  | Weight of One Cubicle | By Vendor |  |
|  | Total Weight of Cubicles | By Vendor |  |
|  | Dynamic Load of One Cubicle | By Vendor |  |
|  | Time Schedule Prepared | By Vendor |  |
|  | Delivery Time | By Vendor |  |
|  | Any Deviations From Spec. | By Vendor |  |
|  | Cable Gland Delivery | Yes |  |
| **14** | **ACCESSORIES** |
|  | Illumination (Y/N) | Yes |  |
|  | Lifting Lugs (Y/N) | Yes |  |
|  | Space Heater With Thermostat (Y/N) | Yes |  |
|  | Humidity Control System (Y/N) | Yes |  |
|  | Mimic Diagram (Y/N) | Yes |  |
|  | C.B. Position Indicator | Yes |  |
|  | Door Key (Y/N) | Yes |  |
|  | C.B. Charging / Retracting (Y/N) | Yes |  |
|  | Installation Kit (Y/N) | Yes |  |
|  | Voltage and Current Test Block for Protection Relays (Y/N) | Yes |  |
|  | Lamp Test Facility (Y/N) | Yes |  |
|  | Automatic Shutter (Y/N) | Yes |  |
|  | Floor Frame (Y/N) | Yes |  |
|  | C.B. Transfer Trolley (Y/N) | Yes |  |
|  | Name Plate & Front Tag & Rear Side Tag (Y/N) | Yes |  |
|  | Telescopic Rotary Handle for MCCB(Y/N)  | Yes |  |
| **15** | **MECHANICAL INTERLOCK** |
|  | Door Shall Not Able To Open When C.B. Is Closed | Yes |  |
|  | Impossibility of C.B. Rack-In / Rack-Out When C.B. Is Closed | Yes |  |
|  | Padlock for C.B. | Yes |  |
|  | MCCB Open / Close From Closed Door Through Lockable Telescopic Rotary Handle | Yes |  |
| **16** | **PANEL SPACE HEATER TECHNICAL DATA** |
|  | Type No. | By Vendor |  |
|  | Control Type | By Vendor |  |
|  | Protection Type | By Vendor |  |
|  | Voltage | 230 VAC |  |
|  | Power Consumption | By Vendor |  |
| **17** | **PANEL LIGHT TECHNICAL DATAs** |
|  | Type No. | By Vendor |  |
|  | Control Type | By Vendor |  |
|  | Protection Type | By Vendor |  |
|  | Voltage | 230 VAC |  |
|  | Power Consumption | By Vendor |  |