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| **طرح نگهداشت و افزایش تولید 27 مخزن** |
| **DATA SHEETS FOR LV SWITCHGEAR****نگهداشت و افزایش تولید میدان نفتی بینک** |
|  |  |  |  |  |  |  |
| D03 | Apr.2023 | AFC | H.Shakiba | M.Fakharian | A.M.Mohseni |  |
| D02 | Jul.2022 | IFA | H.Shakiba | M.Fakharian | M.Mehrshad |  |
| D01 | May. 2021 | IFA | H.Shakiba | M.Fakharian | M.Mehrshad |  |
| D00 | Feb. 2021 | IFC | H.Shakiba | M.Fakharian | M.Mehrshad |  |
| **Rev.** | **Date** | **Purpose of Issue/Status** | **Prepared by:** | **Checked by:** | **Approved by:** | **Client Approval** |
| **Class:1** | **Client Doc. Number:** **F0Z-709022** |
| **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 | X | X |  | **51** |  |  |  |  |  |
| **2** | X | X | X | X |  | **52** |  |  |  |  |  |
| **3** | X | X | X |  |  | **53** |  |  |  |  |  |
| **4** | X | X | X |  |  | **54** |  |  |  |  |  |
| **5** | X | X |  |  |  | **55** |  |  |  |  |  |
| **6** | X | X |  |  |  | **56** |  |  |  |  |  |
| **7** | X | X |  |  |  | **57** |  |  |  |  |  |
| **8** | X | X |  |  |  | **58** |  |  |  |  |  |
| **9** | X | X |  |  |  | **59** |  |  |  |  |  |
| **10** |  | X | X |  |  | **60** |  |  |  |  |  |
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| **16** |  |  |  |  |  | **66** |  |  |  |  |  |
| **17** |  |  |  |  |  | **67** |  |  |  |  |  |
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| **Technical Data Sheet for LV Switchgear of Compressor Station** |
| --- |
| **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 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)
 |  |
|  | 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 | 2000 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-GCS-PEDCO-120-EL-SL-0002 |  |
|  | 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-GCS-PEDCO-120-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-GCS-PEDCO-120-EL-SL-0002” |  |
|  | NO. of Poles | According to “BK-GCS-PEDCO-120-EL-SL-0002” |  |
| **6** | **SWITCH-FUSE** |
|  | Manufacturer of Switch-Fuse | By Vendor |  |
|  | Rated Insulation Voltage | 1000 VAC |  |
|  | Rated Operating Voltage | 400 VAC |  |
|  | Rated Current | According to “BK-GCS-PEDCO-120-EL-SL-0002” |  |
|  | 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-GCS-PEDCO-120-EL-SL-0002” |  |
|  | 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-GCS-PEDCO-120-EL-SL-0002” |  |
|  | 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 |  |

**Note:**

1. All signal colors shall be listed and explained by Vendor.
2. According to IPS-M-EL-143(3), the rated ultimate short circuit breaking capacity (Icu) and rated service short circuit breaking capacity (Ics) shall be equal.
3. Technical data for all labels shall be given by Vendor.
4. For all CB sizing, SLD shall be considered as reference.
5. All CBs accessories shall be mentioned by Vendor such as:

 - Shunt trip coil & close coil

 - Spring charged motor and hand operated

 - Anti-pumping device

 - Circuit breaker racking-in/out lever

 - Mechanical signaling device for C.B. open / close

 - Operation counter

 - Earthing contact on truck

6- According to note 2 of “Electrical Typical Schematic Diagrams for LV Panel (BK-GCS-PEDCO-120-EL-DG-0002-D03)”: “Control circuit voltage for outgoing is 230 VAC which will be supplied for each lv cubicle. In other words for each LV cubicle one isolated dry type transformer shall be considered by vendor”.

 \*: These items will be finalized after preparations and finalized of related document such as power system study, Transformer sizing, load list etc.