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| **طرح نگهداشت و افزایش تولید 27 مخزن** | | | | | | |
| **TBE FOR POWER & CONTROL CABLES**  **نگهداشت و افزایش تولید میدان نفتی بینک** | | | | | | |
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| D00 | Aug.2024 | IFI | H.Shakiba | M.Fakharian | M.Sadeghian |  |
| **Rev.** | **Date** | **Purpose of Issue/Status** | **Prepared by:** | **Checked by:** | **Approved by:** | **Client Approval** |
| **Class:3** | | **Client Doc. Number:** **F0Z-709354** | | | | |
| **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 |  |  |  |  | **51** |  |  |  |  |  |
| **2** | X |  |  |  |  | **52** |  |  |  |  |  |
| **3** | X |  |  |  |  | **53** |  |  |  |  |  |
| **4** | X |  |  |  |  | **54** |  |  |  |  |  |
| **5** | X |  |  |  |  | **55** |  |  |  |  |  |
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| **7** | X |  |  |  |  | **57** |  |  |  |  |  |
| **8** | X |  |  |  |  | **58** |  |  |  |  |  |
| **9** | X |  |  |  |  | **59** |  |  |  |  |  |
| **10** | X |  |  |  |  | **60** |  |  |  |  |  |
| **11** | X |  |  |  |  | **61** |  |  |  |  |  |
| **12** | X |  |  |  |  | **62** |  |  |  |  |  |
| **13** | X |  |  |  |  | **63** |  |  |  |  |  |
| **14** | X |  |  |  |  | **64** |  |  |  |  |  |
| **15** | X |  |  |  |  | **65** |  |  |  |  |  |
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| **TBE for MV Power Cable** | | | | | | | | |
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| **MR** | **PMR for Power & Control Cable**  **(BK-GCS-PEDCO-120-EL-MR-0014)** | **Purchaser Requirement** | **YAZD Cable** | **Status** | **SIMCO Cable** | **Status** | **ABHAR Cable** | **Status** |
| **Item** | **Description** |
| 1. **Environmental Data (Process Basis Design, BK-GNRAL-PEDCO-000-PR-DB-0001)** | | | | | | | | |
|  | Location | Binak Oilfield in Bushehr Province | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Max. Outdoor Ambient Temperature | 52°C | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Min. Outdoor Ambient Temperature | 5°C | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Direct Sunlight Temperature | 85°C | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Maximum Relative Outdoor Humidity | 100% | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Altitude | 12.5 m Above Sea Level | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Installation Method | Direct Buried Cable | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
| 1. **General** | | | | | | | | |
|  | Cable Type | MV Power Cable | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Brief Description (Number of Core) | By Vendor | Un-priced invoice has been attached. | Ok | According. to MTO  BK-GCS-PEDCO-120-EL-MT-0003\_D01 | Ok | As per MTO | Ok |
|  | Manufacturer | By Vendor | Yazd wire & cable Co. | Ok | SIMCO | Ok | Abhar Cable | Ok |
|  | Country | By Vendor | Iran | Ok | IRAN | Ok | Iran | Ok |
|  | Standard | IEC 60502, IPS-M-EL-272 (2) | Ok | Ok | Confirmed | Ok | Confirmed except deviation list. | Ok |
|  | Supply Rated Voltage U0/U [KV] | 1.8/3 - 6/10 KV | Ok | Ok | 3.6/6 – 6/10 KV | Ok | Confirmed | Ok |
|  | Cable Rated Voltage U0/U(Um) [KV] | 1.8/3 (3.6) - 6/10 (12) KV | Ok | Ok | 3.6/6(7.2) – 6/10(12) KV | Ok | Confirmed | Ok |
|  | System Frequency | 50 Hz | Ok | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Quantity | According to Document  “BK-GCS-PEDCO-120-EL-LI-0002” | Un-priced invoice has been attached | Ok | According. to MTO  BK-GCS-PEDCO-120-EL-MT-0003\_D01 | Ok | According to Document  “BK-GCS-PEDCO-120-EL-MT-0003-D01” | Ok |
|  | Length[m] | According to Document  “BK-GCS-PEDCO-120-EL-LI-0002” | Un-priced invoice has been attached | Ok | According. to MTO  BK-GCS-PEDCO-120-EL-MT-0003\_D01 | Ok | According to Document  “BK-GCS-PEDCO-120-EL-MT-0003-D01” | Ok |
|  | Number of Drums | According to Document  “BK-GCS-PEDCO-120-EL-LI-0003” | Will be submitted after PO. | Ok | Confirmed | Ok | Confirmed | Ok |
| 1. **Construction** | | | | | | | | |
|  | Conductor Material | Plain Annealed Stranded Copper | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Conductor Cross Section [mm2] | According to Document  “BK-GCS-PEDCO-120-EL-LI-0002” | As per MTO | Ok | According. to MTO  BK-GCS-PEDCO-120-EL-MT-0003\_D01 | Ok | As per MTO | Ok |
|  | Conductor Construction | Solid | - | Ok | NA | Ok | N.A | Ok |
| Circular Stranded S<=25mm | - | Ok | NA | Ok | The conductor structure of all MV cables is RM. | Ok |
| Shaped Stranded S>=35mm | - | Ok | NA | Ok | N.A | Ok |
| Compressed Circular Stranded | OK | Ok | Confirmed | Ok | N.A | Ok |
|  | Maximum Conductor Temperature | 90°C (for XLPE Insulation) | OK | Ok | Confirmed | Ok | Confirmed | Ok |
| 70°C (for PVC Insulation) | - | Ok | NA | Ok | N.A | Ok |
|  | Maximum Conductor Temperature - Short Circuit | 250°C (for XLPE Insulation) | OK | Ok | Confirmed | Ok | Confirmed | Ok |
| 160°C (for PVC Insulation) | - | Ok | NA | Ok | N.A | Ok |
|  | Conductor Class | Class 2 | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Number of Cores | According to Document  “BK-GCS-PEDCO-120-EL-LI-0002” | As per MTO | Ok | According. to MTO  BK-GCS-PEDCO-120-EL-MT-0003\_D01 | Ok | As per MTO | Ok |
|  | Core Insulation Material | XLPE | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Core Insulation Thickness [mm] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As per IEC60502-2 | Ok |
|  | Core Insulation Colors/Marking | Red, Yellow & Blue | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
|  | Screen Material | Copper | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Screen Cross Section | 16 or 25 | OK | Ok | 16 | Ok | 16 mm2 | Ok |
|  | Filler Type | PVC | OK | Ok | Confirmed (If Applicable) | Ok | According to the data sheet of Abhar cable. | Ok |
|  | Bedding (Inner Sheath) Material | Extruded PVC | OK | Ok | Confirmed | Ok | According to the data sheet of Abhar cable. | Ok |
|  | Bedding Thickness | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | According to the data sheet of Abhar cable. | Ok |
|  | Lead Sheath Thickness | By Vendor (Considered for Process Area) | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As per IEC60502-2 | Ok |
|  | Under armor diameter of cable | VTA | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | According to the data sheet of Abhar cable. | Ok |
|  | Armor Type & Material | Galvanized Steel Wire for Multicore, Aluminum Wire for Single Cores | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Armor Wire Diameter [mm] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As per IEC60502-2 | Ok |
|  | Armor Coverage | Min.90% | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Jacket (Outer Sheath) Material | Extruded PVC | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Jacket Thickness[mm] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As per IEC60502-2 | Ok |
|  | Jacket Color | Red | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
|  | Diameter Under Armor [mm] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | According to the data sheet of Abhar cable. | Ok |
|  | Overall Diameter [mm] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | According to the data sheet of Abhar cable. | Ok |
|  | Minimum Bending Radius | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | According to the data sheet of Abhar cable. | Ok |
|  | Diameter Over Lead Sheath [mm] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | The diameter below the lead sheath is according to the Abhar cable data sheet. | Ok |
|  | Cable Marking | By Vendor | OK | Ok | Mentioned in SIMCO Technical Specification | Ok | According to the data sheet of Abhar cable. | Ok |
|  | Repeating Length [m] | 1m | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Marking Items | Type of cable | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
| Number of conductor and cross Section | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
| Manufacturer’s name | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
| Year of manufacture | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
| Type of insulation | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
| Standard No | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
| 1. **Electrical Characteristics** | | | | | | | | |
|  | DC Resistance of Conductor at 20°C [Ω/Km] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | According to the data sheet of Abhar cable | Ok |
|  | AC Resistance of Conductor at 20°C [Ω/Km] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As pre IEC60228 | Ok |
|  | AC Resistance of Conductor at 70°C [Ω/Km] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As pre IEC60228 | Ok |
|  | DC Resistance of Conductor at 30°C [Ω/Km] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As pre IEC60228 | Ok |
|  | AC Resistance of Conductor at 30°C [Ω/Km] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As pre IEC60228 | Ok |
|  | Phase Reactance [Ω/Km] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As pre IEC60228 | Ok |
|  | Ampacity at 20°C /2.5 Km /W Soil[A] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | According to the catalog of Abhar cable | Ok |
|  | Ampacity at 30°C Free Air [A] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | According to the catalog of Abhar cable | Ok |
| 1. **Mechanical Characteristics** | | | | | | | | |
|  | Maximum Insulation Temperature: | By Vendor | 90 | Ok | 90 | Ok | 90 °C | Ok |
|  | At Continuous Rating [°C ] | By Vendor | 90 | Ok | 90 | Ok | 90 °C | Ok |
|  | At Short Circuit [°C ] | By Vendor | 250 | Ok | 250 | Ok | 250 °C | Ok |
|  | Cable Weight [Kg/Km] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO technical specification | Ok | According to the data sheet of Abhar cable | Ok |
| 1. **Drum Characteristics** | | | | | | | | |
|  | Dimension[mm] | By Vendor | Will be submitted after PO. | Ok | According to Final Cable Cutting List | Ok | Confirmed | Ok |
|  | Drum Type No. | By Vendor | Will be submitted after PO. | Ok | According to Final Cable Cutting List | Ok | Confirmed | Ok |
|  | Cable Length Per Drum[m] | By Vendor | Will be submitted after PO. | Ok | According to Final Cable Cutting List | Ok | Confirmed | Ok |
|  | Drum Weight [Kg] | By Vendor | Will be submitted after PO. | Ok | According to Final Cable Cutting List | Ok | Confirmed | Ok |
|  | Material | By Vendor | Will be submitted after PO. | Ok | According to Final Cable Cutting List | Ok | Confirmed | Ok |
| 1. **Test Items** | | | | | | | | |
|  | Routine Tests: (as minimum)   * Conductor Resistance Measurement * High Voltage Power Frequency Test * Insulation Resistance Measurement * Partial Discharge Test | Yes  By Vendor | ITP has been attached | Ok | Confirmed According. to Standard | Ok | Confirm after P.O & P.I.M | Ok |

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| **Status Legends** | | | |
| A=Acceptable | N/A=Not Applicable | C=Clarification is required |  |
| N=Not Acceptable | INA=Information Not Available | CA= Conditionally Acceptable | M = Requirement is Mandatory |

| **TBE for LV Power Cable** | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **MR** | **PMR for Power & Control Cable**  **(BK-GCS-PEDCO-120-EL-MR-0014)** | **Purchaser Requirement** | **YAZD Cable** | **Status** | **SIMCO Cable** | **Status** | **ABHAR Cable** | **Status** |
| **Item** | **Description** |
| 1. **Environmental Data (Process Basis Design, BK-GNRAL-PEDCO-000-PR-DB-0001)** | | | | | | | | |
|  | Location | Binak Oilfield in Bushehr Province | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Max. Outdoor Ambient Temperature | 52°C | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Min. Outdoor Ambient Temperature | 5°C | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Direct Sunlight Temperature | 85°C | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Maximum Relative Outdoor Humidity | 100% | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Altitude | 12.5 m Above Sea Level | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Installation Method | Direct Buried Cable | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
| 1. **General** | | | | | | | | |
|  | Cable Type | LV Power Cable | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Brief Description (Number of Core) | By Vendor | Un-priced invoice has been attached | Ok | Acc. to MTO  BK-GCS-PEDCO-120-EL-MT-0003\_D01 | Ok | As per MTO | Ok |
|  | Manufacturer | By Vendor | Yazd wire & cable Co. | Ok | SIMCO | Ok | Abhar cable | Ok |
|  | Country | By Vendor | Iran | Ok | IRAN | Ok | Iran | Ok |
|  | Standard | IEC 60502, IPS-M-EL-271(2) | OK | Ok | Confirmed | Ok | Confirmed except deviation list. | Ok |
|  | Supply Rated Voltage U0/U [KV] | 0.6/1 KV | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Cable Rated Voltage U0/U(Um) [KV] | 0.6/1 (1.2) KV | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | System Frequency | 50 Hz | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Quantity | According to Document  “BK-GCS-PEDCO-120-EL-LI-0002” | Un-priced invoice has been attached | Ok | According. to MTO  BK-GCS-PEDCO-120-EL-MT-0003\_D01 | Ok | According to Document  “BK-GCS-PEDCO-120-EL-MT-0003-D01” | Ok |
|  | Length[m] | According to Document  “BK-GCS-PEDCO-120-EL-LI-0002” | Un-priced invoice has been attached | Ok | According. to MTO  BK-GCS-PEDCO-120-EL-MT-0003\_D01 | Ok | According to Document  “BK-GCS-PEDCO-120-EL-MT-0003-D01” | Ok |
|  | Number of Drums | According to Document  “BK-GCS-PEDCO-120-EL-LI-0003” | Will be submitted after PO. | Ok | Confirmed | Ok | Confirmed | Ok |
| 1. **Construction** | | | | | | | | |
|  | Conductor Material | Plain Annealed Stranded Copper | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Conductor Cross Section [mm2] | According to Document  “BK-GCS-PEDCO-120-EL-LI-0002” | As per MTO | Ok | Acc. to MTO  BK-GCS-PEDCO-120-EL-MT-0003\_D01 | Ok | As per MTO | Ok |
|  | Conductor Construction | Solid | Stranded (class 2) | Ok | NA | Ok | N.A | Ok |
| Circular Stranded S<=25mm | Circular Stranded S<=35 mm2 | Ok | Circular Stranded S<=35mm | Ok | Circular Stranded S<=35mm | Ok |
| Shaped Stranded S>=35mm | Shaped Stranded S>=50 mm2 (3 & 4 core cable) | Ok | Shaped Stranded S>=50mm  (Multi Core Cable) | Ok | Shaped Stranded S>=50mm | Ok |
| Compressed Circular Stranded | S>=16 up to including mm2 | Ok | NA | Ok | N.A | Ok |
|  | Maximum Conductor Temperature | 90°C (for XLPE Insulation) | OK | Ok | Confirmed | Ok | Confirmed | Ok |
| 70°C (for PVC Insulation) | OK | Ok | NA | Ok | Confirmed | Ok |
|  | Maximum Conductor Temperature - Short Circuit | 250°C (for XLPE Insulation) | OK | Ok | Confirmed | Ok | Confirmed | Ok |
| 160°C (for PVC Insulation) | OK | Ok | NA | Ok | Confirmed | Ok |
|  | Conductor Class | Class 2 | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Number of Cores | According to Document  “BK-GCS-PEDCO-120-EL-LI-0002” | As per MTO | Ok | Acc. to MTO  BK-GCS-PEDCO-120-EL-MT-0003\_D01 | Ok | As per MTO | Ok |
|  | Core Insulation Material | XLPE (or PVC if Specified in Cable List) | As per MTO | Ok | XLPE | Ok | Confirmed | Ok |
|  | Core Insulation Thickness [mm] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO technical specification | Ok | As per IEC60502-1 | Ok |
|  | Core Insulation Colors/Marking | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO technical specification | Ok | Confirm after P.O | Ok |
|  | Phase Conductors | Red, Yellow and Blue | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
|  | For AC Neutral or Other Connections | Black | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
|  | For Two Core Cable (DC) | Positive: Red , Negative: Black | OK | Ok | NA | Ok | Confirm after P.O | Ok |
|  | Lead Sheath Thickness | By Vendor (Considered for Process Area) | As per vendor technical proposal | Ok | Mentioned in SIMCO technical specification | Ok | As per IEC60502-1 | Ok |
|  | Diameter Over Lead Sheath [mm] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO technical specification | Ok | The diameter below the lead sheath is according to the Abhar cable data sheet. | Ok |
|  | Armor Type & Material | Galvanized Steel Wire for Multicore, Aluminum Wire for Single Cores | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Armor Wire Diameter [mm] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO technical specification | Ok | As per IEC60502-1 | Ok |
|  | Bedding Type | Extruded PVC | OK | Ok | Confirmed | Ok | According to the data sheet of Abhar cable | Ok |
|  | Filler Type | PVC | OK | Ok | Confirmed (IF Applicable) | Ok | According to the data sheet of Abhar cable | Ok |
|  | Jacket (Outer Sheath) Material | Extruded PVC | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Jacket Thickness[mm] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO technical specification | Ok | According to the data sheet of Abhar cable | Ok |
|  | Jacket Color | Black | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
|  | Diameter Under Armor [mm] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO technical specification | Ok | According to the data sheet of Abhar cable | Ok |
|  | Overall Diameter [mm] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO technical specification | Ok | According to the data sheet of Abhar cable | Ok |
|  | Minimum Bending Radius | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO technical specification | Ok | According to the data sheet of Abhar cable | Ok |
|  | Cable Marking | By Vendor | OK, As per vendor technical proposal | Ok | Mentioned in SIMCO technical specification | Ok | According to the data sheet of Abhar cable | Ok |
|  | Repeating Length [m] | 1m | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Marking Items | Type of cable | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
| Number of conductor and cross Section | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
| Manufacturer’s name | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
| Year of manufacture | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
| Type of insulation | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
| Standard No | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
| 1. **Electrical Characteristics** | | | | | | | | |
|  | DC Resistance of Conductor at 20°C [Ω/Km] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | According to the data sheet of Abhar cable | Ok |
|  | AC Resistance of Conductor at 20°C [Ω/Km] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As per IEC60228 | Ok |
|  | AC Resistance of Conductor at 70°C [Ω/Km] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As per IEC60228 | Ok |
|  | DC Resistance of Conductor at 30°C [Ω/Km] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As per IEC60228 | Ok |
|  | AC Resistance of Conductor at 30°C [Ω/Km] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As per IEC60228 | Ok |
|  | Phase Reactance [Ω/Km] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As per IEC60228 | Ok |
|  | Ampacity at 20°C /2.5 Km /W Soil[A] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | According to the catalog of Abhar cable | Ok |
|  | Ampacity at 30°C Free Air [A] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | According to the catalog of Abhar cable | Ok |
| 1. **Mechanical Characteristics** | | | | | | | | |
|  | Maximum Insulation Temperature: | By Vendor | XLPE: 90 | Ok | 90 | Ok | 90 °C For XLPE insulated, 70 °C For PVC insulated | Ok |
|  | At Continuous Rating [°C ] | By Vendor | XLPE: 90 | Ok | 90 | Ok | 90 °C For XLPE insulated, 70 °C For PVC insulated | Ok |
|  | At Short Circuit [°C ] | By Vendor | XLPE: 250 | Ok | 250 | Ok | 250 °C For XLPE insulated, 160 °C For PVC insulated | Ok |
|  | Cable Weight [Kg/Km] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | According to the data sheet of Abhar cable | Ok |
| 1. **Drum Characteristics** | | | | | | | | |
|  | Dimension[mm] | By Vendor | Will be submitted after PO. | Ok | According to Final Cable Cutting List | Ok | Confirmed | Ok |
|  | Drum Type No. | By Vendor | Will be submitted after PO. | Ok | According to Final Cable Cutting List | Ok | Confirmed | Ok |
|  | Cable Length Per Drum[m] | By Vendor | Will be submitted after PO. | Ok | According to Final Cable Cutting List | Ok | Confirmed | Ok |
|  | Drum Weight [Kg] | By Vendor | Will be submitted after PO. | Ok | According to Final Cable Cutting List | Ok | Confirmed | Ok |
|  | Material | By Vendor | Wooden/Metal | Ok | According to Final Cable Cutting List | Ok | Confirmed | Ok |
| 1. **Test Items** | | | | | | | | |
|  | Routine Tests: (as minimum)   * Conductor Resistance Measurement * High Voltage Power Frequency Test * Insulation Resistance Measurement * Partial Discharge Test | Yes  By Vendor | ITP has been attached. | Ok | Confirmed According. to Standard  (partial discharge (PD) Test is not applicable for LV Cable) | Ok | Confirm after P.O & P.I.M | Ok |

|  |  |  |  |
| --- | --- | --- | --- |
| **Status Legends** | | | |
| A=Acceptable | N/A=Not Applicable | C=Clarification is required |  |
| N=Not Acceptable | INA=Information Not Available | CA= Conditionally Acceptable | M = Requirement is Mandatory |

| **TBE for LV Control Cable** | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **MR** | **PMR for Power & Control Cable**  **(BK-GCS-PEDCO-120-EL-MR-0014)** | **Purchaser Requirement** | **YAZD Cable** | **Status** | **SIMCO Cable** | **Status** | **ABHAR Cable** | **Status** |
| **Item** | **Description** |
| 1. **Environmental Data (Process Basis Design, BK-GNRAL-PEDCO-000-PR-DB-0001)** | | | | | | | | |
|  | Location | Binak Oilfield in Bushehr Province | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Max. Outdoor Ambient Temperature | 52°C | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Min. Outdoor Ambient Temperature | 5°C | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Direct Sunlight Temperature | 85°C | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Maximum Relative Outdoor Humidity | 100% | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Altitude | 12.5 m Above Sea Level | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Installation Method | Direct Buried Cable | Confirmed | Ok | Confirmed | Ok | Confirmed | Ok |
| 1. **General** | | | | | | | | |
|  | Cable Type | LV Power Cable | LV control cable | Ok | LV Control Cable | Ok | Confirmed | Ok |
|  | Brief Description (Number of Core) | By Vendor | Un-priced invoice has been attached | Ok | According to MTO  BK-GCS-PEDCO-120-EL-MT-0003\_D01 | Ok | As per MTO | Ok |
|  | Manufacturer | By Vendor | Yazd wire & cable Co. | Ok | SIMCO | Ok | Abhar cable | Ok |
|  | Country | By Vendor | Iran | Ok | Iran | Ok | Iran | Ok |
|  | Standard | IEC 60502, IPS-M-EL-271(2) | OK | Ok | Confirmed | Ok | Confirmed except deviation list. | Ok |
|  | Supply Rated Voltage U0/U [KV] | 0.6/1 KV | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Cable Rated Voltage U0/U(Um) [KV] | 0.6/1 (1.2) KV | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | System Frequency | 50 Hz | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Quantity | According to Document  “BK-GCS-PEDCO-120-EL-LI-0002” | Un-priced invoice has been attached | Ok | Acc. to MTO  BK-GCS-PEDCO-120-EL-MT-0003\_D01 | Ok | According to Document  “BK-GCS-PEDCO-120-EL-MT-0003-D01” | Ok |
|  | Length[m] | According to Document  “BK-GCS-PEDCO-120-EL-LI-0002” | Un-priced invoice has been attached | Ok | Acc. to MTO  BK-GCS-PEDCO-120-EL-MT-0003\_D01 | Ok | According to Document  “BK-GCS-PEDCO-120-EL-MT-0003-D01” | Ok |
|  | Number of Drums | According to Document  “BK-GCS-PEDCO-120-EL-LI-0003” | Will be submitted after PO. | Ok | Confirmed | Ok | Confirmed | Ok |
| 1. **Construction** | | | | | | | | |
|  | Conductor Material | Plain Annealed Stranded Copper | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Conductor Cross Section [mm2] | According to Document  “BK-GCS-PEDCO-120-EL-LI-0002” | Asper MTO | Ok | Acc. to MTO  BK-GCS-PEDCO-120-EL-MT-0003\_D01 | Ok | As per MTO | Ok |
|  | Conductor Construction | Solid | Stranded (class 2) | Ok | NA | Ok | N.A | Ok |
| Circular Stranded S<=25mm | - | Ok | Circular Stranded | Ok | Circular Stranded S<=35mm | Ok |
| Shaped Stranded S>=35mm | - | Ok | NA | Ok | Shaped Stranded S>=50mm | Ok |
| Compressed Circular Stranded | - | Ok | NA | Ok | N.A | Ok |
|  | Maximum Conductor Temperature | 90°C (for XLPE Insulation) | OK | Ok | NA | Ok | Confirmed | Ok |
| 70°C (for PVC Insulation) | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Maximum Conductor Temperature - Short Circuit | 250°C (for XLPE Insulation) | OK | Ok | NA | Ok | Confirmed | Ok |
| 160°C (for PVC Insulation) | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Conductor Class | Class 2 | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Number of Cores | According to Document  “BK-GCS-PEDCO-120-EL-LI-0002” | As per MTO | Ok | Confirmed | Ok | As per MTO | Ok |
|  | Core Insulation Material | XLPE (or PVC if Specified in Cable List) | PVC | Ok | PVC | Ok | Confirmed | Ok |
|  | Core Insulation Thickness [mm] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As per IEC60502-1 | Ok |
|  | Core Insulation Colors/Marking | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | Confirm after P.O | Ok |
|  | Phase Conductors | Red, Yellow and Blue | Black with white No. | Ok | Black and Sequentially White Numbered | Ok | Confirm after P.O | Ok |
|  | For AC Neutral or Other Connections | Black | - | Ok | NA | Ok | Confirm after P.O | Ok |
|  | For Two Core Cable (DC) | Positive: Red , Negative: Black | - | Ok | NA | Ok | Confirm after P.O | Ok |
|  | Lead Sheath Thickness | By Vendor (Considered for Process Area) | As per vendor technical proposal | Ok | Mentioned In SIMCO Technical Specification | Ok | As per IEC60502-1 | Ok |
|  | Diameter Over Lead Sheath [mm] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical specification | Ok | The diameter below the lead sheath is according to the Abhar cable data sheet. | Ok |
|  | Armor Type & Material | Galvanized Steel Wire for Multicore, Aluminum Wire for Single Cores | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Armor Wire Diameter [mm] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As per IEC60502-1 | Ok |
|  | Bedding Type | Extruded PVC | OK | Ok | Confirmed | Ok | According to the data sheet of Abhar cable | Ok |
|  | Filler Type | PVC | OK | Ok | Confirmed (If Applicable) | Ok | According to the data sheet of Abhar cable | Ok |
|  | Jacket (Outer Sheath) Material | Extruded PVC | OK | Ok | Confirmed | Ok | Confirmed | Ok |
|  | Jacket Thickness[mm] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As per IEC60502-1 | Ok |
|  | Jacket Color | Black | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
|  | Diameter Under Armor [mm] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | According to the data sheet of Abhar cable | Ok |
|  | Overall Diameter [mm] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | According to the data sheet of Abhar cable | Ok |
|  | Minimum Bending Radius | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | According to the data sheet of Abhar cable | Ok |
|  | Cable Marking | By Vendor | OK, As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | According to the data sheet of Abhar cable | Ok |
|  | Repeating Length [m] | 1m | OK | Ok | Confirmed | Ok | According to the data sheet of Abhar cable | Ok |
|  | Marking Items | Type of cable | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
| Number of Conductor and Cross Section | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
| Manufacturer’s name | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
| Year of Manufacture | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
| Type of Insulation | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
| Standard No | OK | Ok | Confirmed | Ok | Confirm after P.O | Ok |
| 1. **Electrical Characteristics** | | | | | | | | |
|  | DC Resistance of Conductor at 20°C [Ω/Km] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | According to the data sheet of Abhar cable | Ok |
|  | AC Resistance of Conductor at 20°C [Ω/Km] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As per IEC60228 | Ok |
|  | AC Resistance of Conductor at 70°C [Ω/Km] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As per IEC60228 | Ok |
|  | DC Resistance of Conductor at 30°C [Ω/Km] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As per IEC60228 | Ok |
|  | AC Resistance of Conductor at 30°C [Ω/Km] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As per IEC60228 | Ok |
|  | Phase Reactance [Ω/Km] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | As per IEC60228 | Ok |
|  | Ampacity at 20°C /2.5 Km /W Soil[A] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | According to the catalog of Abhar cable | Ok |
|  | Ampacity at 30°C Free Air [A] | By Vendor | As per vendor technical proposal | Ok | Mentioned in SIMCO Technical Specification | Ok | According to the catalog of Abhar cable | Ok |
| 1. **Mechanical Characteristics** | | | | | | | | |
|  | Maximum Insulation Temperature: | By Vendor |  | Ok | 70 |  | 90 °C For XLPE insulated, 70 °C For PVC insulated | Ok |
|  | At Continuous Rating [°C ] | By Vendor | PVC: 70 | Ok | 70 |  | 90 °C For XLPE insulated, 70 °C For PVC insulated | Ok |
|  | At Short Circuit [°C ] | By Vendor | PVC:160 | Ok | 160 |  | 250 °C For XLPE insulated, 160 °C For PVC insulated | Ok |
|  | Cable Weight [Kg/Km] | By Vendor | According to YAZD Technical | Ok | Mentioned in SIMCO Technical Specification |  | According to the data sheet of Abhar cable | Ok |
| 1. **Drum Characteristics** | | | | | | | | |  |  | As per vendor technical proposal |
|  | Dimension[mm] | By Vendor | Will be submitted after PO. | Ok | According to Final Cable Cutting List |  | Confirmed | Ok |
|  | Drum Type No. | By Vendor | Will be submitted after PO. | Ok | According to Final Cable Cutting List |  | Confirmed | Ok |
|  | Cable Length Per Drum[m] | By Vendor | Will be submitted after PO. | Ok | According to Final Cable Cutting List |  | Confirmed | Ok |
|  | Drum Weight [Kg] | By Vendor | Will be submitted after PO. | Ok | According to Final Cable Cutting List |  | Confirmed | Ok |
|  | Material | By Vendor | Wooden/Metal | Ok | According to Final Cable Cutting List |  | Confirmed | Ok |
| 1. **Test Items** | | | | | | | | |
|  | Routine Tests: (as minimum)   * Conductor Resistance Measurement * High Voltage Power Frequency Test * Insulation Resistance Measurement * Partial Discharge Test | Yes  By Vendor | ITP has been attached. | Ok | Confirmed acc. to Standard  (Partial Discharge (PD) Test is not applicable for .Control Cable) |  | Confirm after P.O & P.I.M | Ok |

|  |  |  |  |
| --- | --- | --- | --- |
| **Status Legends** | | | |
| A=Acceptable | N/A=Not Applicable | C=Clarification is required |  |
| N=Not Acceptable | INA=Information Not Available | CA= Conditionally Acceptable | M = Requirement is Mandatory |

**Conclusion Table:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item** | **Equipment** | **YAZD Cable** | **SIMCO Cable** | **ABHAR Cable** |
| **1** | **MV Power Cable** | Accepted | Accepted | Accepted |
| **2** | **LV Power Cable** | Accepted | Accepted | Accepted |
| **3** | **Control Power Cable** | Accepted | Accepted | Accepted |

**Conclusion Note:**

All vendors have no deviations.