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| **طرح نگهداشت و افزایش تولید 27 مخزن** | | | | | | |
| **DATA SHEETS FOR DIESEL GENERATOR OF WELL PADS**  **نگهداشت و افزایش تولید میدان نفتی بینک** | | | | | | |
| D05 | Aug. 2023 | AFC | H.Shakiba | M.Fakharian | A.M.Mohseni |  |
| D04 | May. 2023 | AFC | H.Shakiba | M.Fakharian | A.M.Mohseni |  |
| D03 | Oct. 2022 | IFA | H.Shakiba | M.Fakharian | M.Mehrshad |  |
| D02 | Aug. 2022 | IFA | H.Shakiba | M.Fakharian | M.Mehrshad |  |
| D01 | Apr. 2022 | IFA | H.Shakiba | M.Fakharian | M.Mehrshad |  |
| D00 | Sep. 2021 | IFC | H.Shakiba | M.Fakharian | Sh.Ghalikar |  |
| **Rev.** | **Date** | **Purpose of Issue/Status** | **Prepared by:** | **Checked by:** | **Approved by:** | **Client Approval** |
| **Class: 1** | | **Client Doc. Number: F0Z-707391** | | | | |
| **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** | **D05** |  | **PAGE** | **D00** | **D01** | **D02** | **D03** | **D04** | **D05** |
| **1** | X | X | X | X | X | X | **51** |  |  |  |  |  |  |
| **2** | X | X | X | X | X | X | **52** |  |  |  |  |  |  |
| **3** | X | X | X |  |  |  | **53** |  |  |  |  |  |  |
| **4** | X | X | X | X |  |  | **54** |  |  |  |  |  |  |
| **5** | X | X | X |  |  |  | **55** |  |  |  |  |  |  |
| **6** |  | X | X | X |  | X | **56** |  |  |  |  |  |  |
| **7** |  | X | X |  |  |  | **57** |  |  |  |  |  |  |
| **8** |  | X | X | X |  |  | **58** |  |  |  |  |  |  |
| **9** |  | X | X |  |  | X | **59** |  |  |  |  |  |  |
| **10** |  |  |  |  |  | X | **60** |  |  |  |  |  |  |
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| **Technical Data Sheet for Diesel Generator of Well Pads** | | | |
| --- | --- | --- | --- |
| **Item** | **Description** | **Requirement** | **Supplier's Data** |
| **1** | **GENERAL** | | |
|  | Location | Binak Oilfield in Bushehr Province |  |
|  | Reference | IPS-E-EL-100 (1)  IPS-M-EL-138 (1)  IPS-M-PM-290 (1) |  |
|  | Max. Outdoor Ambient Temperature | 52°C |  |
|  | Min. Outdoor Ambient Temperature | -5°C |  |
|  | Direct Sunlight Temperature | 85°C |  |
|  | Maximum Relative Outdoor Humidity | 100% |  |
|  | Altitude | 12.5 m Above Sea Level |  |
|  | Installation Method | Outdoor (Under Shelter) |  |
| **2** | **ENGINE SPECIFICATIONS** | | |
|  | Manufacturer | By Vendor |  |
|  | Model | By Vendor |  |
|  | Type | Industrial, 4 strokes, Direct Injection |  |
|  | Duty | Emergency Standby  (Calculated for Continuous Operation) |  |
|  | Aspiration | Turbo Charged, Intercooler |  |
|  | Cylinder Configuration | By Vendor |  |
|  | Number of Cylinders | By Vendor |  |
|  | Displacement (Liter) | By Vendor |  |
|  | Bore/Stroke (mm) | By Vendor |  |
|  | Compression Ratio | By Vendor |  |
|  | Governor Type | Electronic |  |
|  | Air Cleaner Type | Heavy Duty |  |
|  | Engine Speed (rpm) | 1500 |  |
|  | Derating Factor at Site Conditions (55°C) | (MFR Shall Advise Value) |  |
|  | ISO Gross Shaft Power (kW) at: | - |  |
| Continuous | > 175.7 |  |
| Prime | > 202 |  |
| Maximum Standby | > 193.3 |  |
|  | ISO Net Shaft Power (kW) at: | - |  |
| Continuous | 165.5 |  |
| Prime | > 190.3 |  |
| Maximum Standby | > 182 |  |
|  | Cooling Fan Power Requirement (kW) | 10 (Assumption) |  |
|  | Bore Mean Effective Pressure (Bar) at: | - |  |
| Continuous Power | By Vendor |  |
| Prime Power | By Vendor |  |
| Standby Power | By Vendor |  |
|  | Piston Speed | By Vendor |  |
|  | Starting System | Electrical |  |
|  | Type of Batteries | Nickel Cadmium (Type H, Vented) |  |
|  | Quantity of Batteries | 20 |  |
|  | Size of Batteries | By Vendor |  |
|  | Max. Startup & Loading Time to Full Load | 10 Sec. |  |
| **3** | **LUBRICATING SYSTEM** | | |
|  | Type | Forced Feed by Gear Oil Pump |  |
|  | Total oil Capacity min. / max. (Liter) | By Vendor |  |
|  | Oil Filter | By Vendor |  |
|  | Oil Cooler | Water Cooled |  |
|  | Oil Type Required | By Vendor |  |
|  | Lube oil Consumption (gr/h) at: | - |  |
| Continuous Power | By Vendor |  |
| Prime Power | By Vendor |  |
| Standby Power | By Vendor |  |
| **4** | **FUEL SYSTEM** | | |
|  | Type of Fuel | Gas Oil |  |
|  | Fuel Filter Type | By Vendor |  |
|  | Permissible Suction Head | By Vendor |  |
|  | Permissible Return Head | By Vendor |  |
|  | Daily Tank | For 8 Hours Operation |  |
|  | Specified Fuel Consumption (gr/kWh) at: | - |  |
| 100% Maximum Standby Power | By Vendor |  |
| Prime Power | By Vendor |  |
| 100% Continuous Power | By Vendor |  |
| **5** | **COOLING SYSTEM** | | |
|  | Total Coolant Capacity (Lt) | By Vendor |  |
|  | Water Pump Type | Centrifugal |  |
|  | Temp. Rise Across Engine (ºC) at: | - |  |
| Continuous Power | By Vendor |  |
| Prime Power | By Vendor |  |
| Standby Power | By Vendor |  |
|  | Heat Rejection to Exhaust (kW) Prime Power | By Vendor |  |
|  | Heat Rejection to Coolant (kW) Prime Power | By Vendor |  |
|  | Heat Rejection to Intercooler (kW) Prime Power | By Vendor |  |
|  | Heat Rejection by Radiation From Engine Surface (kW) Prime Power | By Vendor |  |
|  | Cooling Air Required for Radiator (m3/h) Prime Power | By Vendor |  |
| **6** | **AIR INTAKE** | | |
|  | Combustion Air Flow (m3/h) at: | - |  |
| Standby Power | By Vendor |  |
| Prime Power | By Vendor |  |
| Continuous Power | By Vendor |  |
|  | Max. Air Intake Restriction of Engine (hPa) | - |  |
| With New Filter | By Vendor |  |
| With Used Filter | By Vendor |  |
|  | Alternator Cooling Air (m3/h) | By Vendor |  |
| **7** | **EXHAUST SYSTEM** | | |
|  | Max. Allowable Back Pressure  for Exhaust Line (Pa) | By Vendor |  |
|  | Exhaust Flow (at Standby Power) (m3/h) | By Vendor |  |
|  | Exhaust Gas Temp After Turbine  (at Standby Power) (ºC) | By Vendor |  |
|  | Silencer Type | Residential |  |
|  | Spark Arrester | Required |  |
| **8** | **ENGINE AUXILIARIES** | | |
|  | Alternator Manufacturer | By Vendor |  |
|  | Alternator Voltage (V) | By Vendor |  |
|  | Alternator Current (A) | By Vendor |  |
|  | Starter Manufacturer | By Vendor |  |
|  | Starter Motor Voltage (V) | By Vendor |  |
|  | Starter Motor Power (kW) | By Vendor |  |
| **9** | **GENERATOR SPECIFICATIONS** | | |
|  | Quantity / Duty | 1 X 100% / Continuous | D05 |
|  | Manufacturer / Type | By Vendor |  |
|  | Continuous Rating (MCR) at Standard Condition for Class F Temperature Rise (KVA) | > 250 kVA to Meet Continuous Operation  (Note 1) |  |
|  | De-rating Factor for Ambient Temperature Kt | (MFR Shall Advise His Value) |  |
|  | De-rating Factor for Altitude Ka | 1 |  |
|  | Total Generator de-Rating Factor Kd=Ka\*Kt | (MFR Shall Advise His Value) |  |
|  | Continuous Rating (MCR) at Site Conditions for Class F Temp. Rise (KVA) | >178.6 kVA to Meet Continuous Operation |  |
|  | Permissible Overload  (Class B Temp. Rise & Standby Duty) (KVA) | 10% of Rated Current for a Period of One Hour |  |
|  | Starting Capability  (12% Voltage Dip at Gen. Terminal) | By Vendor (Note 2) |  |
|  | Unbalance Loading Capacity (%) | 15% |  |
|  | Power Factor | 0.80 |  |
|  | Terminal Voltage (V) | 400 |  |
|  | Stator Winding Connection | Series Star |  |
|  | Frequency (Hz) | 50 |  |
|  | Grounding | Solidly Grounded |  |
|  | Neutral Point | Brought Out |  |
|  | Insulation Class | F |  |
|  | Temp. Rise for Continuous Duty | B |  |
|  | Ingress Protection of Terminal Box | IP55 |  |
|  | Ingress Protection for Generator | IP23 |  |
|  | Short Circuit Ratio at Rated Volts & Current | According to SLD (BK-SSGRL-PEDCO-110-EL-SL-0002) |  |
|  | Synchronous Reactance Xd  (base 600kVA, 400V, Saturated) (p.u.) | By Vendor |  |
|  | Direct Axis Transient Reactance X’d1 (p.u.) | By Vendor |  |
|  | Direct Axis sub-trans. Reactance X”d (p.u.) | By Vendor |  |
|  | Quadrature Axis Reactance Xq (p.u.) | By Vendor |  |
|  | Quadrature Axis sub-trans. Reactance X”q(p.u.) | By Vendor |  |
|  | Zero Sequence Reactance X0 (p.u.) | By Vendor |  |
|  | Negative Sequence Reactance X2 (p.u.) | By Vendor |  |
|  | Leakage Reactance XL (p.u.) | By Vendor |  |
|  | Time Constants (sec): | - |  |
| Td’ | By Vendor |  |
| Td” | By Vendor |  |
| Ta | By Vendor |  |
|  | Generator Efficiency at (%): | - |  |
| 1/2 Full Load | By Vendor |  |
| 3/4 Full Load | By Vendor |  |
| 4/4 Full Load | By Vendor |  |
|  | Number of Bearings | 1 (2 is Preferred) |  |
|  | Type of Bearings / Lubrication | Anti Friction / Grease |  |
|  | Generator Space Heater | Required |  |
| Voltage (V) | 230 (V) |  |
| Power (W) | By Vendor |  |
|  | Exciter Type | Self-Excited (PMG is preferred)  Brushless, 3 Phase Sensing |  |
|  | Exciter Voltage | By Vendor |  |
|  | Exciter Manufacturer | By Vendor |  |
|  | AVR Model | By Vendor |  |
|  | Voltage Regulation | ±5% |  |
|  | Exciter Current at (A): | - |  |
| Continuous Operation | By Vendor |  |
| Short Time Overload | By Vendor |  |
| **10** | **CONTROL PANEL** | | |
|  | Manufacturer | By Vendor |  |
|  | Standard | IEC, IPS-M-EL-143(3) |  |
|  | Type | Fixed |  |
|  | Construction | Self-Standing |  |
|  | Sheet Steel Thickness | 2mm Wall / 2.5 mm Frame |  |
|  | Access | Front Via Hinged Door |  |
|  | Location | Outdoor (Under Shelter) |  |
|  | Ingress Protection | IP54 |  |
|  | Busbar System | 3Ph+N+PE |  |
|  | Rated Busbar Current (A) | 630 |  |
|  | Busbar Material | Copper (Insulated With Heat Shrink) |  |
|  | Protection Functions  (Embedded in ACB Protection Unit) | According to SLD (BK-SSGRL-PEDCO-110-EL-SL-0002) |  |
|  | Protection Functions  (Other than ACB Protection Unit) | According to SLD (BK-SSGRL-PEDCO-110-EL-SL-0002) |  |
|  | Controller Manufacturer / Model no. | By Vendor |  |
|  | Indicators on Panel | According to SLD (BK-SSGRL-PEDCO-110-EL-SL-0002) (Open, Close, Fault) |  |
|  | Transducers (4~20mA output) | Generator Voltage  Frequency |  |
|  | Generator Neutral CT | According to SLD (BK-SSGRL-PEDCO-110-EL-SL-0002) |  |
|  | Earth Fault Protections | Required |  |
|  | Panel Accessories | Anti Condensation Heater  Panel Lighting  Removable Gland Plate |  |
|  | Finish Color | RAL 7032 |  |
|  | Cable Entry | Bottom via Cable Gland |  |
|  | Cable Specification & Size  From Generator to Local Panel:  From Local Panel to LV Switchgear: | According to Cable Sizing |  |
| **11** | **SWITCH DEVICE** | | |
|  | Type of Switching Device | ACB |  |
|  | Manufacturer | By Vendor |  |
|  | Type Designation | By Vendor |  |
|  | Operating Mechanism | Motor Operated, Spring Charged,  Stored Energy, Trip Free Mechanism |  |
|  | Number of Poles | 4 |  |
|  | Rated Current | 630 |  |
|  | Rated Voltage | 690 |  |
|  | Standard | IEC |  |
|  | Rated Breaking Current | Not Less Than 35kA |  |
|  | Charging Motor Operating Voltage | 24 (Fed From Diesel Batteries) |  |
|  | Trip Unit | Electronic type |  |
|  | Trip Unit Functions | According to SLD (BK-SSGRL-PEDCO-110-EL-SL-0002) |  |
|  | Trip Unit Model | By Vendor |  |
| **12** | **GENERATOR ACCESSORIES** | | |
|  | RTD (Pt100) | Yes (9 RTD’s for S > 500kVA) |  |
|  | Lifting Bolts | Yes |  |
|  | Earthing Bolt | Yes |  |
|  | Drain Plug | Yes |  |
| **13** | **GENERAL** | | |
|  | Noise Level | Not Exceed 81 dB (A) in No Load Running |  |
|  | Weight of Diesel Engine Without Oil & Water (kg) | By Vendor |  |
|  | Weight of Generator (kg) | By Vendor |  |
|  | Weight of Diesel Generator Skid (kg) | By Vendor |  |
|  | Overall Dimension of Diesel Generator Skid (W x D x H) (mm) | By Vendor |  |
|  | Dimension of Control Panel  (W x D x H) (mm) | By Vendor |  |

\* Note 1 of item 9.3: According to document “Calculation Note for Diesel Generator Sizing of Well Pads (BK-SSGRL-PEDCO-110-EL-CN-0008-D03)” , a generator with 198.5 KVA is sufficient, but for future loads, a diesel with 250 KVA will be supplied.

D05

\* Note 2 of item 9.9: Since in well pads, there is no motor feeder type on switchgear, therefore starting of biggest motor has not been studied.