PROPOSAL

Presented To:

Derwick Associates, S.A.

for

Relay Protection

Morichal Facility

*Prepared By*





Proposal No. 710-3650 Rev 1

August 31, 2010

This document is privileged and contains confidential information intended for use only by

Derwick Associates.

1. **Introduction**

Energy Parts Solutions (“EPS”) is pleased to present this scope of work for the design, programming an installation of the 115kV and 13.8kV Relay Protection for the two (2) new GE LM-6000 generators being installed at the Morichal Facility located in Venezuela.

1. **Work Scope**

The scope of work will include new primary and backup protection and controls for the two generators G1 and G2, two Generator Step Up (GSU) transformers TX-3 and TX-4 and 115kv circuit breakers H1020 and H720. The scope will include a new pre-engineered control house with lighting and power, free standing relay/control and metering panels, transformer on-line DGA monitors and interconnection control cabling between the 115kV yard, 13.8kV bus and the control house. All relays will be IEC 61850 compliant and manufactured by Schweitzer. The relay and metering panels will consist of free standing cabinets with swing out panels, prewired with test blocks and terminal blocks. Shorting type blocks will be used for all CT leads. All control wiring will be #12 awg with CT leads being #10 awg. Each panel will have a separate fuse block for AC and DC power.

Interconnection cables will be installed between the existing control house and the new control house to have mimic operation of the H1020 and H720 circuit breakers. The 50BF protection will be extended to the various bank circuit breakers for breaker failure protection. The metering and controls will be mapped to a new remote terminal unit utilizing DNP3.0 which can then be connected to the existing fiber ring. Revenue metering will be on the 115kV side using ION 8800 meters; a meter will also be located on the station service transformer for net metering purposes. All control switches will be Electroswitch, SCADA ready with lighted nameplate for indication and breaker coil monitoring. Protective relays will be programmed, tested and functionally tested along with the control system following installation.

The enclosed One-Line diagram provides the proposed protection scheme for the two new generators interconnection to the existing 115kV yard. The primary generator protection will be provided by a SEL-700G. The 15kV generator breakers will be equipped with a SEL-351 for overcurrent protection and backup generator protection. The station service feeder breakers will also be equipped with SEL-351 breakers for overcurrent protection. Primary transformer protection will be provided by a SEL-487E Transformer Protection Relay. The transformer backup protection will be provided by a SEL-787 Transformer Protection Relay. The overcurrent and breaker failure protection for the 115kV breakers will be provided by SEL-351 relays.

PDVSA will be providing the new 115kV circuit breaker for the H1020 bay, the two 70/90MVA transformers, 13.8kV switchgear and LM6000 units. All required yard excavation, foundations and installation of conduits or trench ways will be performed by PDVSA. All existing 115kV equipment will be reused throughout the remainder of the yard. BOP is by PDVSA.

Below is an outline of the scope of work required for the proposed 13.8kV and 115kV protection scheme for the two (2) new generators at the Morichal generating facility.

**Electrical Design**

* One Line diagram
* Three line diagram
* Schematic diagrams
* New panel layout/arrangement drawing
* New panel wiring diagrams and interconnect drawings

**Transformer TX-3 Protection Cabinet**

* SEL-487 Transformers Primary Protection
* SEL-787 Transformers Backup Protection
* ElectroSwitch LOR lockout relays
* FT-1 or FT-19R test switches for each relay and LOR

**Transformer TX-4 Protection Cabinet**

* SEL-487 Transformers Primary Protection
* SEL-787 Transformers Backup Protection
* ElectroSwitch LOR lockout relays
* FT-1 or FT-19R test switches for each relay and LOR

**CB H720 Protection Cabinet**

* SEL-351 115kV Overcurrent Protection
* ElectroSwitch 52CSR control relay
* ElectroSwitch LOR lockout relays
* FT-1 or FT-19R test switches for each relay and LOR

**CB H1020 Protection Cabinet**

* SEL-351 115kV Overcurrent Protection
* ElectroSwitch 52CSR control relay
* ElectroSwitch LOR lockout relays
* FT-1 or FT-19R test switches for each relay and LOR

**Annunciator Cabinet**

* Generator G1 Annunciator Panel
* Generator G2 Annunciator Panel
* Satellite clock

**15kV Protection (located in 15kV Switchgear)**

* SEL-700G Primary Generator Protection
* SEL-351 Generator Breaker Protection
* SEL-351 Feeder Breaker Protection

**Metering Panel**

* Generator G1 115kV Metering Ion 8800
* Generator G1 15kV (station service) Metering Ion 8800
* Generator G2 115kV Metering Ion 8800
* Generator G2 15kV (station service) Metering Ion 8800

**Control House Enclosure – Pre-Engineered**

* Battery Room
* 125VDC battery system
* Battery Charger
* Ventilation
* Convenience outlets and lighting
* Install Transformer TX-3 Protection Cabinet
* Install Transformer TX-4 Protection Cabinet
* Install CB H720 Protection Cabinet
* Install CB H1020 Protection Cabinet
* Install Metering cabinet
* Install G1/G2 Annunciator Panel

**Control Wiring**

* Install of DC circuits in control house
* Install new control cabling from 15kV switchgear to Control House.
* Install new control cabling from switchyard current transformers Control House.
* Install new control cabling from circuit breakers H1020, H1120, H720 and H820 to Control House
* Install new control cabling from Transformers TX-3 and TX-4 to Control House.
* Terminate control wiring in new relay panels.

**SCADA**

* Provide and install RTU compatible with existing plant system and IEC 61850 compliant.
* Develop I/O points list.

**TRANSFORMER ON-LINE DGA**

* Provide and install Kelman TransFIX transformer monitor on each GSU.
* Develop program and I/O points list.

**Relay Settings/Programs**

* Develop Relay Protective Setting.
* Develop Programs for SEL relays.
* Develop testing and commissioning requirements for new relay protection schemes.

**Testing/Commissioning**

* Relay
  + Check tightness of connections
  + Functional test of each elements used in the protection scheme.
  + Verify operation of light-emitting diodes, display, and targets.
  + Check all internal logic functions used in the protection scheme.
  + Check all output contacts
  + Check operation of all active digital inputs
* Current Transformers
  + Check tightness of connections
  + Perform Insulation-resistance test of each current transformer and its secondary wiring with respect to ground at 1000 volts dc for one minute.
  + Perform a polarity test of each current transformer.
  + Perform a ratio-verification test
* Voltage Transformers
  + Check tightness of connections
  + Perform insulation-resistance tests winding-to-winding and each winding-to-ground.
  + Perform a turns-ratio test on all tap positions
* Wire check of all protection and control circuits to ensure wiring is installed in accordance with design drawings
* Functional testing of all Protection and control circuits.

1. **Assumptions and Clarifications**

The following assumptions and clarifications have been made in the preparation of this proposal:

* Please see attached schedule for this project. We are currently working to decrease the schedule.
* The above references proposal represents our understanding of your requirements based on our engineering review conducted during the week of July 5th, 2010. If for any reason you do not agree with the above proposed protection scheme please let us know immediately so that we can modify your proposal accordingly.

1. **Pricing**

The scope of work outlined above will be performed for the following pricing:

|  |  |
| --- | --- |
| **Description** | **Price** |
| Engineering, Programming and Expenses | $564,464 |
| Installation Labor | $303,360 |
| Testing/Commissioning | $210,000 |
| Material | $1,290,000 |
| **TOTAL** | **$2,367,824** |

* 1. Payment Information

Wire information for Energy Parts Solutions:

JPMorgan Chase & Co.

ABA Routing No.: 021000021

SWIFT CODE: CHASUS33

Account Number: 886042027

This proposal is based on the following payment milestones:

35% Upon placement of order

25% Upon submittal of drawings

25% Upon mobilization to site for installation

15% Upon completion

1. **Terms & Conditions**

This proposal shall be valid for thirty (30) days; provided, however, the obligation to treat this proposal as confidential, and that it cannot be shared with any third party without the prior written consent of ProEnergy, shall survive.

This proposal, and any resulting contract or agreement, shall be subject to the terms and conditions set forth in the attached Supplemental Terms.

1. **Follow Up**

Please contact the following person at ProEnergy for information regarding this proposal:

Joaquin Mavares, Director of International Sales or Omar Petit, Regional Sales Manager

[jmavares@proenergyservices.com](mailto:jmavares@proenergyservices.com) [opetit@proenergyservices.com](mailto:opetit@proenergyservices.com)

Office: 660-829-5100 Office: 660-829-5100

Cell: 713-992-1790 Cell: 660-281-8588

1. **Conclusion**

***Why select ProEnergy Services?***

EPS is the right teaming partner for Derwick! EPS has talent, depth of experience and resources unparalleled in the power generation industry. When you succeed, we succeed. EPS will win your confidence and your business one job at a time, starting now!

**Attachment A**

**Supplemental Terms**

These Supplemental Terms complement and are included as part of Energy Parts Solution’s Proposal No. 710-3650 Rev 1 dated August 31, 2010 to Derwick for the Morichal Relay Protection and would be included in any resulting Contract:

1. Terms obligating ProEnergy to accept pre-existing site conditions and drawing specifications shall only apply in the event ProEnergy has actually been to the sight or inspected the drawings prior to commencement of the work.

2. For invoice payments not received by ProEnergy within 30 days from the date of receipt, a late fee of the lesser of 1 ½ % per month or the highest rate allow by applicable law may be assessed. If Client fails to timely make payment ProEnergy may also suspend or terminate performance of any and all of its work.

3. No retainage will apply in the event ProEnergy is required to post a performance bond. In no event shall retainage exceed 10% of each invoiced amount.

4. Any prohibition on placing a lien on the project by ProEnergy shall be subject to Client fulfilling its payment obligations under the Contract.

5. The parties shall indemnify, defend and hold one other harmless from and against any and all liabilities, claims, demands, suits, losses, damages, costs and expenses (including reasonable attorney fees and court costs) for bodily injury to or death of any third person, or damage to or destruction of any property of third party, caused by any negligent act or omission on the part of the indemnifying party its officers, employees, contractors or agents, except to the extent such liabilities, claims, suits, losses, damages, costs and expenses result from any negligent or willful act or omission on the part of the indemnified party, its officers, employees, contractors or agents.

6. ProEnergy’s obligation to indemnify and protect Client against infringement of third party intellectual property rights is subject to: (i) ProEnergy’s right to settle or defend such claim or seek the right of continued use or modify or replace the infringing work, (ii) only work which is otherwise not provided according to Client’s design or instructions, (iii) the work being used by Client for its intended use under the Contract, and (iv) any work not manufactured or developed directly by ProEnergy will be limited only to the indemnity, if any, of the manufacturer or vendor of said work.

7. ProEnergy shall not be responsible or liable for delays in performance of its obligations under the Contract due to any event of force majeure or any other cause beyond its reasonable control.

8. ProEnergy warrants that its work shall be performed in a competent, diligent and workmanlike manner, of good quality and material, and in compliance with any mutually agreed written instructions or specifications. ProEnergy’s work shall be warranted for a period of one (1) year from the date of completing the work. Any repairs or replacements made to ProEnergy’s work during the warranty period shall be warranted for the remainder of the original warranty term or 90 days, whichever is longer. This provision sets forth the exclusive remedies for all claims based on failure of or defect in the ProEnergy’s work provided under the Contract whether the failure arises before, during or after the warranty period and whether said claim is based on contract, indemnity, warranty, tort (including negligence), strict liability or otherwise. **NO IMPLIED, STATUTORY, OR COMMON LAW WARRANTY OF ANY KIND, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY.** The duties, liabilities and obligations of ProEnergy do not extend to any repairs, adjustments, alterations, replacements or maintenance that may be required as a result of normal wear and tear, normal degradation in the performance of equipment, or as a result of (a) improper repair or alteration by Client or other persons, and (b) misuse, negligence or damage by Client or other persons (c) excessive operation at peak capacity, frequent starting, type of fuel, detrimental air inlet conditions, or erosion, corrosion or material deposit of fluids. The warranty and remedies are further conditioned upon (i) the proper storage, installation, operation and maintenance of the equipment and conformance with the operation and instruction manuals provided by the suppliers and manufacturers and (ii) repair or modification pursuant to the instructions of the suppliers and manufacturers and as otherwise directed by ProEnergy.

9. Care, custody, control and risk of loss for the work of ProEnergy shall pass to Client upon the earlier of when the work is completed or when it is taken over and used by Client.

10. The total liability of ProEnergy for all claims of any kind, whether based on contract, warranty, tort (including negligence), indemnity, strict liability or otherwise, for any loss or damage arising out of, connected with, or resulting from the Contract or its work shall in no case exceed the total contract price for the work giving rise to such claim plus any insurance proceeds recovered under the coverages furnished by ProEnergy under the Contract. Notwithstanding anything in the Contract or at law to the contrary, ProEnergy shall in no event be liable for exemplary, special, incidental, indirect or consequential damages of any kind including, but not limited to, loss of use, profits or revenue. ProEnergy shall have no liability for its competent performance of instructions given by Client or its personnel or representatives in the event such instructions prove to be defective.

11. ProEnergy will be given at least 10 days advance written notice and an opportunity to cure before Client may terminate the Contract for a breach of any material term of the Contract by ProEnergy.

12. In the event ProEnergy agrees to the payment of liquidated damages (LDs) for unexcused shortfalls in any guaranteed performance or delays in any guaranteed completion date(s) then (i) the payment of LDs shall be Client’s exclusive remedy (ii) the total amount of LDs shall not exceed 10% of the total contract price unless otherwise agreed, and (iii) a corresponding bonus shall be paid by Client to ProEnergy in the event of better than guaranteed performance or early completion by ProEnergy.

13. Any dispute which cannot be settled amicably between the parties under the Contract will be submitted to binding and final arbitration under the Rules of the American Arbitration Associationand such proceeding will be held in a mutually agreeable location.

14. ProEnergy is not responsible for furnishing any performance bonds and builder’s risk or professional liability insurance unless specifically included in its proposal and proposal price.