CONTRACT NO. PIC B-1191A SUBSTATION 10J AND SATELLITE SUBSTATION 101

DESCRIPTION OF PROJECT

The work of this contract will include all Engineering, Procurement and Construction (EPC) activities to provide a 380 / 115 / 34.5 kV substation 10J (SS10J) in land block C1A, in Madinat Yanbu al-Sinaiyah (MYAS) and also to provide 380 kV transmission circuits on lattice steel towers to interconnect SS10J. This contract will also provide 34.5 / 13.8 kV Satellite Substation 101 (SS101) to be located in land block C1A and connect it to SS10J. Major elements of the work include the following:

1. 380 / 115 / 34.5 kV Substation 10J (SS10J):

   - Site preparation including fencing and connection to utilities.

   - SS10J building including building structure and basement, internal partitions, equipment shelters, internal utilities, fire water storage and pumping and battery electrolyte spill neutralization system.

   - Switchgears at SS10J:

     380 kV, indoor, SF6 Gas Insulated Switchgear (GIS) with station control system, on-line diagnostic system and revenue metering; four (4) bays in 1-1/2 breaker configuration.

     115 kV, indoor, SF6 GIS with controls, monitoring and revenue metering integrated into the SS10J station control system; two (2) incoming, seven (7) outgoing and one (1) bus coupler circuit breakers arranged in single breaker, double bus configuration.

     34.5 kV, indoor, metal clad switchgear with bus duct connections to transformers, bus duct connection between sections, controls, monitoring, revenue metering and protective relaying systems. Lineup consisting of three (3) incoming circuit breakers, two (2) buses tie circuit breakers and twelve (12) outgoing circuit breakers.

   - Transformers at SS10J:

     Two (2) 300 / 400 / 500 MVA, 380 kV – 115 kV transformers with deluge fire suppression system.

     Three (3) 100 / 125 MVA, 115 kV – 34.5 kV transformers with deluge fire suppression system.

   - Gantry equipment including 380 kV SF6 gas-to-air bushings, lightning arresters and capacitive coupled voltage transformers

(CCVTs) all with structural steel bases, foundations and surrounding fence with lockable gate.

- SF6 GIS busbar (GIB), outdoor type, for connections between each 380 kV and 115 kV GIS and transformers and between 380 kV GIS and gantry equipment.

- SF6 GIS busbar, outdoor type with cable end units for terminating 380 kV cable circuits.

- Related protection, control, metering, modification of protective relay systems at Southern Sector Power Plant (SSPP) site 380 kV Switchyard and MYAS Power Plant (MYASPP) 380 kV Switchyard, Power Line Carrier (PLC) equipment and connection with tower line circuits.

- Integration of substation Supervisory Control and Data Acquisition (SCADA) system and Automatic Load Shedding (ALS) system into the MYASPP Load Dispatch Center (LDC) including master and MIS station modifications.

- Digital Fault Recording (DFR) and Dynamic System Monitoring (DSM) systems.

2. 34.5 / 13.8 kV Satellite Substation 101 (SS101):

- Site preparation including fencing and connection to utilities.

- SS101 building including building structure and basement, internal partitions, equipment shelters, internal utilities, fire water storage and pumping and battery electrolyte spill neutralization system.

- 34.5 kV, indoor, metal clad switchgear with controls, monitoring, revenue metering and protective relaying systems.

- 13.8 kV, indoor, metal clad switchgear with bus duct connections to transformers, controls, monitoring and protective relaying systems. Lineup consisting of two (2) incoming, one (1) bus tie and sixteen (16) outgoing circuit breakers.

- Two (2) 40/50 MVA, 34.5 kV – 13.8 kV, transformers with neutral grounding resistors, oil spill control and deluge fire suppression system.

- Integration of substation Supervisory Control and Data Acquisition (SCADA) system into the MYASPP Load Dispatch Center (LDC) including master and MIS station modifications.

3. 380 kV transmission circuits, approximately 0.4 km long on lattice steel towers:

- One (1) special lattice tension tower for installation in the existing 380 kV tower line to provide for cutting into line No. 7 and extension to SS10J.
- One (1) lattice tension dead end tower at the SS10J site.
- Conductors and suspension insulators
- Two (2) optical ground wires (OPGWs)
- Tower foundations, grounding systems, gantry structure, station post insulators at gantry structure, painting of towers and gantry and aviation warning devices.

4. 34.5 kV circuits from SS10J to supply power to SS101:

- Two (2) 34.5 kV cable circuits in underground duct bank and manhole system from SS10J to SS101.
- Fiber optic communication cables installed in duct bank and manhole system.