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Southwest Baghdad electricity substation adds stability

By Grant Sattler
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The 400kV Gas Insulated Switchgear is housed indoors and connects the 400kV transmission lines with 132kV distribution lines. (USACE photo)

BAGHDAD, Iraq – Businesses and residences of southwest Baghdad will soon benefit from the recent completion of electricity transmission lines and the energizing of a major substation today.

The al-Rasheed 400kV substation was energized May 28, 2008 on the 400kV electrical grid only a few days after the Iraqi Ministry of Electricity completed the

hook up of a new 11 kilometer 400kV transmission line to the station.

“While this is not a generation station, it will however increase reliability of power for all people in southwest Baghdad,” said Navy Lt. Cmdr. Andrew Johnson, Gulf Region Division government lead for electricity transmission and distribution projects in Iraq. “It will connect them directly to the 400kV grid and it is a much more reli-



Gulf Region Division, station personnel and the Siemens commissioning engineer talk about bringing the substation on line in the 400kV Gas Insulated Switchgear building. (USACE photo)

able, much more stable source of power than what they are used to having.”

Johnson said the energizing of the substation is a tremendous example of partnership. “I think that it’s awesome,” he said. “It’s a success story of interaction between the Government of Iraq’s Ministry of Electricity and the Army Corps of Engineers where the two sides work together and come to a common point at the point in time when they are supposed to. I think it is one of the success stories of the reconstruction of Iraq.”

Johnson explained that a substation converts electricity from one voltage level to another. In the case of the al Rasheed 400kV substation, modern Gas Insulated Switchgear in the facility protects the new transmission lines while new transformers “step down” the 400 kV power from the transmission lines to 132 kV for distribu-

tion to southwest Baghdad. In those neighborhoods power is stepped down further by transformers to the consumer level of 220 volts, 50 amperes.

Johnson said reliability, from the perspective of the consumer, is having power when you expect to have power, but that service in Iraq will remain well below the western standard of 24 hours of power a day for several more years. Only lines feeding essential services such as hospitals, police stations and water and sewage facilities, are energized around the clock due to limited generation capacity.

“While we are not able to bridge the difference in [generation] capacity and demand...we can at least guarantee them that 40-50 percent of their day they will have power, rather than the 10 or 20 percent that they are having now,” he said.



Workers install components of the switchgear. (USACE photo)

Across Iraq, the construction of new, dependable electricity transmission and distribution lines, substations and transformers goes hand in hand with increasing electricity generation in gradually improving the extremely underfunded, antiquated electric grid.

"This is a brand new substation with brand new transmission lines coming out of it...this will be an increase in capacity for transmission of power to their homes, and on a day to day basis they will see more electricity for longer periods," Johnson said.

Maj. Timothy Reed, Civil Affairs Officer for the 1st Brigade, 4th Infantry Division operating in southwest Baghdad, said Soldiers on the street do see an impact after completion of reconstruction projects. "The big thing is people are more satisfied

when things get done, when they have more electricity they are more welcoming. You'll see more people come out and greet you," Reed said. "It's always a great time to go out and meet the people and shake the hands. Because you know you are doing the right thing, they know you are doing the right thing. They are more open to you. They are more willing to give you more tips when you show that you provide for them, they will provide for you."

Work on the almost \$38 million Iraq Relief and Reconstruction Fund project began April 15, 2006. Although a new substation, the project was actually a rebuild of a previous effort.

Construction of the substation originally known as Baghdad Central 400kV substation began under the Oil for Food program

in 2001 but was abandoned in 2003 when approximately 80 percent complete.

In the aftermath of the downfall of Saddam Hussein's regime, the substation suffered heavy looting and all moveable and readily re-usable equipment was stolen. The buildings also suffered extensive damage and most low voltage and control cables were stripped. All protection and all 400 kV and 132kV control cubicle panels were damaged beyond repair, according to reports.

Starting essentially from scratch, the project installed the 400kV Gas Insulated Switchgear and 400kV Air Insulated Switchgear for four overhead line bays and four 250MVA transformer bays that are configured as a dozen - 400/132kV 83MVA single phase auto transformers and an additional spare.

Also included in the project was the 132kV Gas Insulated Switchgear rehabilitation, replacement of the 11kV switchgear, low voltage switchgear, low voltage cables and control cables; and refurbishment of all buildings and building services for the facility.



The substation is operated from a modern control room. (USACE photo)



Operators control the substation from state of the art control panels. (USACE photo)

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