

## **RMEK SCADA Control Center, Telecommunication and SS Automation System for 3 Northern Governates**

### **Executive Summary**

The Ministry of Electricity of KRG, Iraq awarded the contract for complete Engineering, Procurement and Construction works necessary to establish a SCADA and Communication center at KRCC/Azadi Building, RMEK, Erbil. The objective of this JICA (Japan International Cooperation Agency) funded EPC contract is to install the 1<sup>st</sup> Phase of the Transmission SCADA Control Center for the 3 Governates; namely Erbil, Dohuk & Sulaymaniyah. The contract was awarded Uskom on an EPC basis and had a record completion target of 8 months for a project of this magnitude and complexity. The project is completed in full harmony of RMEK and Uskom teams meeting all targets and satisfaction of our valuable Client.

The electrical power system owned and operated by the Regional Ministry of Electricity in Erbil, Dohuk and Sulaymaniyah has been subjected to rapid expansion and growth in the recent years.

Presently the RMEK interconnected power grid handles over 4500 MW of peak power demand and is connected to generating plants with installed capacity exceeding 6000 MW. Approximately 90% of the generating plants are owned by the private sector (IPPs). The supplied demand is currently curtailed through a load shedding program due to limitations of energy generated.

The old practice of network control, which was extensively based on voice communication, is no longer adequate to maintain an acceptable overview of the system. This becomes especially critical in the event of disturbances where normal operating conditions cannot be re-established as rapidly as it would be necessary to limit the duration of outages and thus minimize the amount of undelivered energy and losses of revenues.



The system control function essentially requires real time data of the power system and effective voice communication system.

However, till date RMEK was compelled to control and manage its power system with substantial constraints with no access to real time system data and with limited and outdated voice communication facilities.



Non availability of these essential and basic facilities greatly compromised the reliability, quality, economy, and safety of the electricity supply provided to the entire region. Further, it also affects enforcement of technical and commercial conditions in power purchase from the IPPs.

The project has aimed at establishing basic, minimum and immediate requirements for data at 23 and voice communications at 52 HV substations and power stations, which is essential for effective management of the KRG power system in the interim. The systems established under this project would facilitate close monitoring and coordination of IPP operations and enforcement of technical and commercial conditions as per power purchase agreements. Further it would ensure effective monitoring and management of the losses contributing to overall economy of electricity supply by RMEK.

The system is designed as the 1<sup>st</sup> building block to be expanded to cover all remaining RMEK substations and generation plants at next phases planned for implementation in coming years.

## **Brief Project Description**

### **SCADA National Load Control Center**

The SCADA Control Center is established at RMEK Erbil SCADA Control Building and is equipped with modern and functional dispatcher facilities and a large videowall display.

The system presently monitors and controls 23 HV Stations and has capacity to be expanded to cover more than 150+ RTUs which is above the presently planned transmission network.

Further expansion for advanced applications is available by modularly adding and/or updates into the system.

The communication ports are redundant and each RTU or substation automation system communicates to SCADA Master with 2 FE ports with IEC60870-5-104 protocol.

### **Telecom Transmission, Management and Telephone System**

The transmission and telephone system is also part of this contract. The optical transmission system covers 52 power stations and substations.

The system is based on SDH technology operating over OPGW Based fiber optic media with STM-1 and STM-4 rates and all user interfaces are based on Ethernet over SDH.

SDH equipment are fully redundant and provide redundant FE interfaces for RTU/Local SCADA communication with Control Center. The optical system has ethernet ports for telephone communication and provide VoIP voice access over ethernet at all nodes.

SDH system is as well connected to a Network Management System (NMS) and complete system is managed from NMS including provisioning and trail management capabilities.

The telephone network is based on Selta SAM 4000 equipment. The SAM 4000 E installed at Control Center is in full redundancy and includes a redundant voice recording system.

