

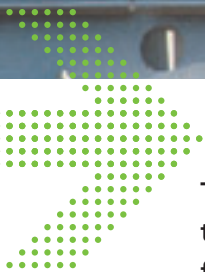


Case study • Power utility

Alcatel-Lucent 

EGYPTIAN ELECTRICITY TRANSMISSION COMPANY, EGYPT

MONITORING THE TRANSMISSION GRID IN REAL TIME



The Egyptian Electricity Transmission Company (ETTC) — responsible for Egypt's transmission grid — needed a secure and cost-effective network to support SCADA functionality and voice and data communications for its new regional control center. It called on Alcatel-Lucent to design, build and commission a turnkey, integrated communications solution to meet these needs.

EETC's Perspective

CHALLENGES

The Egyptian Electricity Transmission Company (EETC) required a telecommunications network (including fiber optic links, microwave links and power line carrier) to support SCADA functionality and telephone communications, providing mission-critical services for the transmission grid. The network had to link the new EETC regional control center (RCC) to substations throughout Egypt's West Nile Delta region. The new RCC also had to be linked to the other RCCs and to the National Energy Control Center (NECC).

The project's key objectives were to:

- **Monitor the transmission grid in real time** from the RCCs and all substations in the West Delta region.
- **Ensure efficient, cost-effective traffic control and routing.**
- **Provide high-speed data and voice links** between the high-voltage substations and the West Delta RCC.

EETC selected Alcatel-Lucent for the West Delta Regional Control Center (WDRCC) project because of its expertise in network integration, capacity for managing large network deployments and local presence in Egypt.

SOLUTION

Alcatel-Lucent was responsible for the design, construction and commissioning of a turnkey integrated communications solution to simultaneously support a SCADA (supervisory control and data acquisition) system, and voice and data communications. Key components included:

- **Optical network** based on 1,000 km of OPGW fiber optic cables installed on power lines.
- **Access network** for hotline, voice telephony and low-speed data to connect the SCADA system.
- **Connection of the WDRCC** to two other RCCs over microwave links.
- **Two voice networks:** a secure hotline network and a voice network for administrative use.

BENEFITS

- Efficient, cost-effective traffic control and routing across all network levels.
- Real-time monitoring of the grid, ensuring fewer network disturbances and shorter durations for any outages.

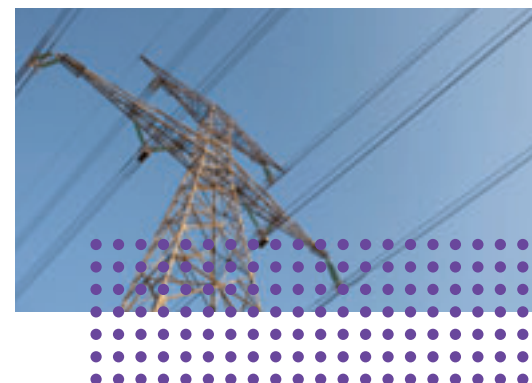
ABOUT EETC

- A government-owned company, EETC is responsible for the transmission grid in Egypt.
- The company manages, operates and maintains the high voltage (HV) and extra-high-voltage (EHV) power transmission grid nationwide.
- EETC purchases bulk power produced by Egypt's power plants and sells bulk power to the nation's electricity distribution companies and HV and EHV customers.



"EETC selected Alcatel-Lucent to design, build and deploy a telecommunications network for the new Regional Control Center in the West Nile Delta region because of its outstanding network integration skills, expertise in managing large network deployments and local presence in Egypt."

Eng. Ahmed Ra'afat, Executive Board Member, North Region of EETC



Alcatel-Lucent's Perspective

CUSTOMER REQUIREMENTS

EETC's main objective was to provide telecommunications to serve the electricity transmission system in a secure, redundant way throughout the West Nile Delta region. The regional control center, located in Damanhur City, had to enable EETC to monitor the electricity grid in the region. Moreover, the network needed to provide high-speed data and voice links between high-voltage substations and the WDRCC, which monitors power delivery throughout the relevant power network.

OUR METHODOLOGY

For strategic reasons, the Alcatel-Lucent team split the project into two stages:

Stage 1: deployment of optical fiber cables (OPGW and ADSS) on high-voltage lines. Cables were installed along approximately 1,000 km of 66 KV and 220 KV power lines.



Patrick Desforges
Alcatel-Lucent
General Project Manager

"Alcatel-Lucent assumed full responsibility for the West Nile Delta project, delivering a state-of-the-art, robust, integrated communications solution, enabling EETC to focus on meeting Egypt's ever-increasing demand for power transmission."

Stage 2: deployment of the communications

infrastructure (transmission, access and telephony) to facilitate voice and data communications between the RCC and 55 substations, as well as a telephony system for operations use.

DELIVERY CHALLENGES

Health, safety and environmental constraints:

To meet the project's demanding safety requirements, Alcatel-Lucent established strategic relationships with existing field service contractors, who carried out all deployment activities.

Network designed to support mission-critical services:

The network architecture had to be carefully designed to support a variety of critical services, including teleprotection (with its very stringent network requirements), legacy SCADA communications, operational voice, hotline, etc.

Project schedule compliance:

To comply with a strict timetable for technical interfaces, Alcatel-Lucent established tight coordination with Areva T&D, which handled implementation of the SCADA package, construction of the regional control center and refurbishing of the substations.

THE ADDED VALUE

Alcatel-Lucent's solution brought EETC the capacity and flexibility of a modern network, providing highly reliable communications that are needed to support EETC's evolution to modern energy technologies.





The EETC's Solution at a Glance

THE BUSINESS SOLUTION

Alcatel-Lucent provided the Egyptian Electricity Transmission Company (EETC) with a turnkey, integrated communications solution that supports a SCADA system and voice and data communications for a new regional control center in Egypt's West Nile Delta region, an irrigated, rural area with a high population density.

The Alcatel-Lucent network uses fiber optic links, microwave links and power line carrier to connect EETC's new West Delta Regional Control Center with 55 substations throughout the region, as well as other regional control centers and the National Energy Control Center.

THE TECHNICAL SOLUTION

Alcatel-Lucent services

- Engineering, supply, deployment, installation, and commissioning of the telecommunication network
- Training of operations staff

Optical network

- 1,000 km of OPGW fiber optic cables installed on power lines

SDH transmission equipment

- SDH Optical Multi-Service Node (OMSN) system based on 3 SDH STM1 interconnected loops and muxes to provide various analog and digital interfaces
- SDH ADM in all substations (1650 SMC - Optinex Family)
- 1353 SH/1354 RM for the centralized network management system (EML level)

Access network for hotline, voice telephony and low-speed data to connect the SCADA system

- Alcatel-Lucent 1511 BA multi-service mux, an access node built around a first-order PCM multiplexer
- Alcatel-Lucent 1353 AC, with a single point of access for network element provisioning, troubleshooting, and maintenance



West Delta Regional Control Center (WDRCC), Damanhur City, Egypt

Voice networks

- A voice network for administrative use (4 Alcatel-Lucent OmniPCX Enterprise IP PBXs)
- A secure hotline network (1 Alcatel-Lucent OmniPCX Enterprise IP PBX) with voice recording unit

Power back-up

- 48V DC uninterruptible power supply (UPS)

www.alcatel-lucent.com

Alcatel, Lucent, Alcatel-Lucent, the Alcatel-Lucent logo are trademarks of Alcatel-Lucent. All other trademarks are the property of their respective owners. Alcatel-Lucent assumes no responsibility for the accuracy of the information presented, which is subject to change without notice.

Photos: Alcatel-Lucent, EETC – Design: Enjoy-Artco – Content: Editech.

04/2009 – All rights reserved © 2009 Alcatel-Lucent.