

# Paraguay Power Company Deploys JumboSwitch® as Lower Cost Alternative to SONET/SDH System

## Case Study

### The Challenge:

#### Finding a Budget-friendly Alternative to SONET/SDH

Power Utilities in South America have traditionally used SDH/SONET systems for their substation communications networks.

However, when the National Power Company of Paraguay (ANDE) received a budget-busting six figure price quote for each SDH/SONET node for a proposed substation network expansion and upgrade, they immediately began researching lower cost Ethernet/IP alternatives.

ANDE's requirements for the new communications system were rigorous. It needed to support teleprotection relay circuit latency requirements of less than 12 msec. (round trip), provide E1 connectivity to PBXs located at two substations, and enable dedicated POTS service with PBX capability to all nodes.

### Solution:

#### Cost Effective Multi-service Ethernet Platform

TC Communication's JumboSwitch Multi-service Ethernet Platform met all ANDE requirements. Costing less than a comparable SDH/SONET system, the JumboSwitch provided all the required interfaces for ANDE's applications: Ethernet, Teleprotection (RS-232), E1 over IP and VoIP with virtual PBX capability.

In addition, the JumboSwitch system offered a comprehensive network management system – TCVIEW® – to empower technicians to deploy, maintain and reconfigure a JumboSwitch network with minimal training.

For example, configuring a point-to-point Teleprotection circuit with the JumboSwitch is a simple matter of programming the source IP address to the destination IP address. Conversely, configuring this same circuit on a SDH/SONET system is more complicated and time consuming.

Before making a decision, ANDE sent a special "substation project" team to Irvine, California to visit and inspect the TC Communications headquarters and manufacturing facility. In addition, the team traveled to LeMars, Iowa to get an in-depth tour and review of an extensive 40-node JumboSwitch network currently being used by the Northwest Iowa Power Cooperative.

The right decision was clear.



### Objective

- Establish lower cost Ethernet/ IP alternative to SDH/SONET node for substation network expansion and upgrade
- Support teleprotection relay circuit latency requirements of less than 12 msec. (round trip), provide E1 connectivity to PBXs located at two substations, and enable dedicated POTS service with PBX capability to all nodes

### Products Used

- [JumboSwitch®](#)
- [TCView®: Network management Software](#)
- [TC3845-1: T1/E1 over IP](#)
- [TC3847-3: Turbo Serial over IP](#)
- [TC3848-1/-2: VoIP](#)

### Key Benefits

- Significant cost savings over comparable SONET/SDH system
- Comprehensive network management

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## Results:

### Seamless Installation & Hands-on Training

The installation was smooth from start to finish. ANDE deployed the JumboSwitch's E1 over IP card to link to its Remote Terminal Units (RTU), the "Turbo serial" RS-232 low latency card for Teleprotection relays, and the VoIP card to enable voice communications between the substations and back to the central office. (See diagram on page 3).

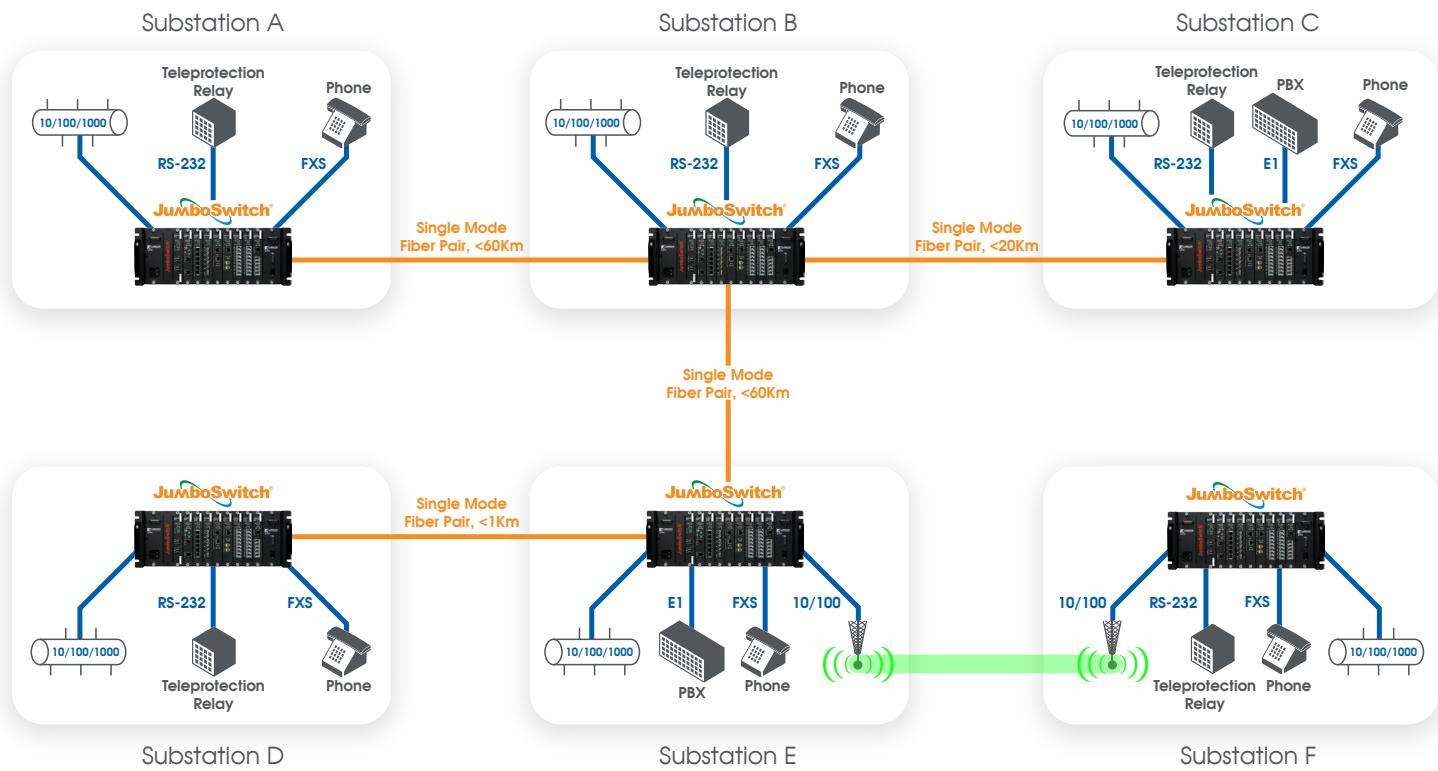
Hands-on training was conducted in both Spanish and English languages by a team of four JumboSwitch engineers, (including one fluent in Spanish), from TC Communications. The team traveled to ANDE headquarters in Asuncion, Paraguay and spent five days training and demonstrating JumboSwitch's features to approximately 15 of ANDE's technical employees.



## About TC Communications

TC Communications designs industry focused communications products in Power, Public Safety, Rail, Military, Aviation, and Oil & Gas. Our products assist in the evolution of legacy networks and specialize in bridging the gap in the transition to IP networks. Our mission is to design products that are easy to use and won't break. All TC products are designed, tested, and supported in Irvine, California since 1991.

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The JumboSwitch network connects five substations around the city of Asuncion, Paraguay back to the Central Office. The 250km self-healing ring network infrastructure is comprised of single mode fiber and one microwave link.



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