

# Unión Eléctrica– Cuba

## Self-Healing, Supervised Network for a Reliable Power Supply



### PROJECT AT A GLANCE

#### Project type

Implementation of a self-healing, supervised network

#### Customer

Unión Eléctrica (electric utility)

#### Location

Havana, Cuba

#### Applications

Underground MV Network

#### Equipments Installed

Primary:

Easergy T200I type SHG

Secondary:

Easergy L500 SCADA

### CUSTOMER BENEFITS

- Self-healing solution enables fault isolation and service restoration in under 30 seconds
- Comprehensive electrical network management
- Security of supply and minimized loss of revenue
- Efficient maintenance
- Valuable training for technical staff
- Decentralized control
- Quick deployment, no DMS required
- Provide early information about the upcoming investments
- Peace of mind



Cuba's main economic and touristic centre, Havana has now a self-healing grid

### The Customer

Unión Eléctrica is a public service firm that generates, transmits, distributes, and commercializes electric energy. It brings together 35 companies including power-generating plants, provincial distribution companies, consulting and so on.

The company has an installed capacity of 3267 MW and covers 95% of Cuba, with over 2.9 million customers along the country.

### The Challenge

Unión Eléctrica has experienced in the past, power **outages** in its distribution grid. A slight fault could have a **huge** impact !  
The default responsible for an **outage** was nearly impossible to localize. The network was very **old** and **obsolete**, without any **automation**.

To better serve its customers, Unión Eléctrica through its purchased subsidiary Energoimport wanted to upgrade the electrical grid, which for the most part dated back in 1950s.

So the challenge facing the utility was to give its grid a new lease of life and come up with a cost-effective, automated solution to quickly re-energize its MV network in case of a fault, identifying the fault location quickly and reconnecting the maximum number of consumers and businesses possible.

The purpose of the Self-Healing Grid (SHG) technology is to help automate the process of restoration of supply to keep interruptions, if any, to a bare minimum. Unlike the conventional centralized control approach, SHG is a totally decentralized approach. In case of power fault, every substation communicates with each other to execute the best instruction. The average localization and restoration time with SHG is **less than 30 seconds!**



## The Partnership

Having considered its options, Energoimport turned to Schneider Electric. The reason? Mainly, the two companies already had a business relationship, having worked together for the past 20 years. Schneider Electric, this time, was asked to undertake 2 projects secured through a complex financial agreement.

## The Solution

The objective of the first project was to overhaul the dispatching system of the whole transmission network of the country, the second, the modernization and reliability improvement of the electrical grid in old Havana. For the latter, where EAC Beynost was especially involved, the Cuban customer wanted to improve significantly its **SAIDI** (System Average Interruption Duration Index) in a short period of **time** and with minor additional **costs**.

Schneider Electric, thanks to a decentralized pre-engineered **TVDA** (Tested Validated Documented Architecture), and suggested an innovative solution: automated loops with Self-Healing Grid (**SHG**), which acts like a reflex system and requires very little human intervention.

The Self Healing Grid (SHG) automation system uses a set of Easergy T200I switch controllers customized to meet tropical requirements in Cuba. It executes an automatic sequence to locate and isolate MV network faults or short circuits and then re-energizes the healthy parts if it is safe to do so.

The MV electrical network is a single ring supplied from two circuit breakers and having a single open point.

During the process of a SHG, the T200s in a ring communicate with their immediate neighbours through Modbus. Media used for peer-to-peer communication is either Ethernet or GPRS.

For the old Havana project, 16 MV loops were to be equipped with Schneider Electric decentralized SHG solution.

To begin, 4 loops all equipped with comprehensive new MV-LV substations to be set (including Trihal transformers, motorized RM6, Easergy T200I with the SHG soft, and L500), were ordered in 2013 and commissioned mid 2014. A showroom, with the display of the SHG solution was also put together. Unión Eléctrica technical staff has actually been trained in it.

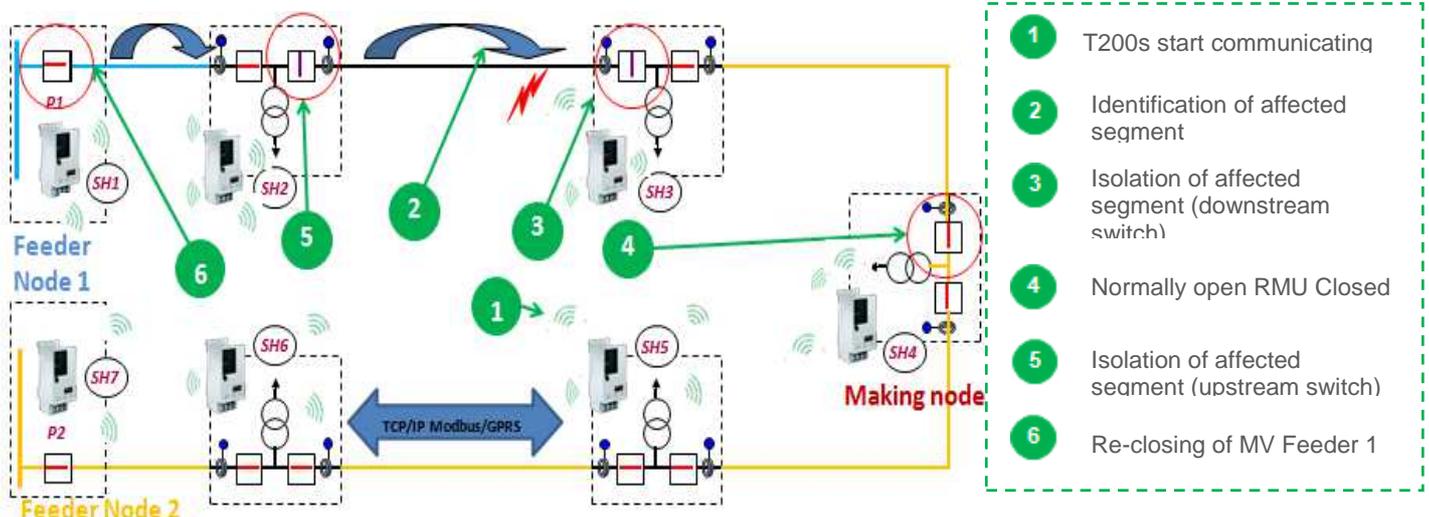
The first part of the old Havana project, led by **Projects & Engineering Center** with the support of **EAC Beynost**, through the automation part, took around 18 months to complete, from first concepts to commissioning.

## The Bottom Line

Schneider Electric proved once again its short time to market capacity and was able to understand and satisfy the customer's requirements by proposing an adequate solution. Its capacity to manage this type of project within a particular contractual framework resulting from a complex financial context was also a key factor.

The solution adapted to the very demanding environmental conditions also convinced the customer, along with several successful previous contracts established relations of trust.

For the utility, the system offers lots of benefits, including more efficiency and valuable training for technical staff. That means greater power availability for greater customers' satisfaction !



# Self-Healing Grid Process