MOSCAD Provides Brazil's Electric Utility with a Leap Forward in Technology

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CEMIG is one of Brazil's leading power utilities, operating in the areas of electricity generation, transmission and distribution. Since the distribution network covers a vast geographical area, CEMIG manages the area by regions, using a Regional Operating Central (ROC) in each region.

The Challenge

In the past, CEMIG used control equipment which was purchased from various companies, such as ABB, Westinghouse and Siemens. This equipment was considered by CEMIG to be outdated, and was no longer able to meet their requirements.

CEMIG wanted to implement a Global Substation Automation System in the Minas Gerais state, and was looking for a solution that would answer all present, as well as future needs.

The Solution

The Motorola system proposed by its integrator in Brazil, Control S/A, was chosen by CEMIG as their system of the future.

Control S/A supplied CEMIG with two regional control systems for the ROCs in the cities of Paractu and Uberaba. The first system has 6 MOSCAD RTUs, and the second has 13 MOSCAD RTUs. Both systems control a total of 3500 I/O points (analog and digital). The centrals are based on the Realflex SCADA software by 5BJ Software Systems. *(See system diagram on next page)*

The RTUs are used to control and monitor transformers, breakers, bays, reclosers and other general purpose devices.

The RTUs are linked to Field Interface Units (FIUs), communicating by means of Motorola's advanced MDLC protocol. The FIU converts the MDLC protocol to the MODBUS protocol, for communication with the Realflex central.

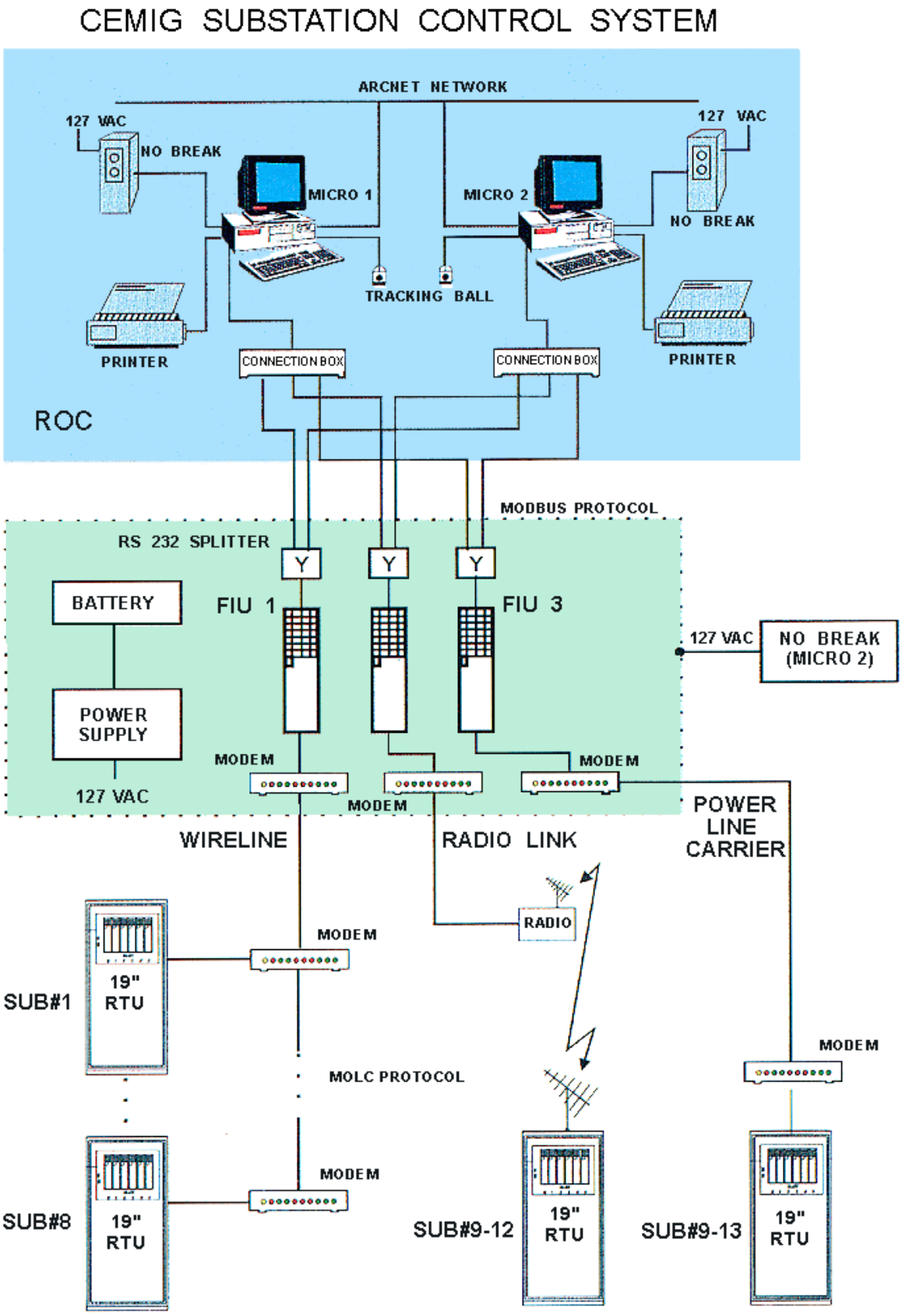
The physical communications media used to connect between the RTUs and FIUs varies, depending on the limitations of the terrain. The CEMIG system implements UHF/VHF radio links, leased lines and power line carriers. Each central features a hot-standby configuration, in order to provide the system with full redundancy.

Benefits

CEMIG have expressed their satisfaction at the way the system has worked out, for the following reasons:

The versatility of the communications equipment, which allows moving critical data in a quick and reliable manner, using numerous physical media.

The programming flexibility of the MOSCAD RTU, which makes it easy to tailor the RTUs to the customer's site requirements. This represents a considerable leap forward in the technology, as compared to their previous system.


CEMIG SUBSTATION CONTROL SYSTEM
ARCNET NETWORK
127 VAC
NO BREAK
MICRO 1
MICRO 2
127 VAC
NO BREAK
TRACKING BALL
PRINTER
CONNECTION BOX
CONNECTION BOX
PRINTER
ROC
MODBUS PROTOCOL
RS 232 SPLITTER
Y
Y
Y
BATTERY
FIU 1
FIU 3
127 VAC
NO BREAK (MICRO 2)
POWER SUPPLY
MODEM
MODEM
127 VAC
MODEM
WIRELINE
RADIO LINK
POWER LINE CARRIER
RADIO
MODEM
SUB#1
19" RTU
MOLC PROTOCOL
MODEM
MODEM
SUB#8
19" RTU
SUB#9-12
19" RTU
SUB#9-13
19" RTU

The MOSCAD RTUs received very high approval ratings from two of Brazil's top standards institutes, the INPE and the IPT. These institutes stated that, based on its wide range of modules and tools, the MOSCAD RTUs are well suited for any SCADA application, particularly for the electrical substations environment.

The customer anticipates that once they will assume maintenance of the system themselves, they will be able to get the most out of the system. The customer also plans to expand the infrastructure even more once they will start self-maintaining the system.

In summary: the customer is satisfied with the performance and reliability of the Motorola

system, as well as the support they received from the Motorola team. This success story will inevitably lead to additional sales in Brazil, as well as repeat sales to one of Brazil's largest government-owned companies.

Congratulations to Control S/A for a job well done in Brazil!