

PROJECT NARRATIVE



System Description

Owner: GAMEK

A/E: OPTIMA Moscow

Plant Name: Capanda Hydroelectric Power Plant

Product Type: Ovation

Unit #: 3 and 4 plus auxiliaries

Unit Size: 130 MW each

Location: Quanza River Basin, Republic of Angola

Plant Type: Hydroelectric plant with LMZ Francis turbines

Application: (HPP) Hydro Power Plant control including Balance of Plant, Switchgear 220kV control, Switch-gear 0,4kV control, Data Acquisition

Contract Initiation: November 2002

Ship Date: November 2003

Operational Date: May 2004

Major System Components

- 1 Fast Ethernet Network
- 6 Redundant Controllers
- 2 Dual Operator Workstations
- 1 Engineer/Operator Workstation
- 1 Ovation Historian
- 6 Serial Interface Links

Distributed Control System I/O

Points:

2566 Total I/O Points
200 Data Linked Points



MEDIO KWANZA DEVELOPMENT DEPARTMENT (GAMEK) Capanda Hydroelectric Dam Located on the Quanza River, Malange, Republic of Angola, Africa

Since attaining independence from Portugal in 1975, Angola has been in a state of nearly constant civil war. This has caused significant portions of the country's power generation and transmission facilities to be damaged, resulting in chronic water and power outages throughout much of the country's interior.

In 2002, Angola announced plans for a major rehabilitation of its power sector infrastructure. A key element of this plan is the 520-megawatt Capanda Hydroelectric Dam in Malange, which is about 190 miles (300 km) east of Angola's capital city, Luanda.

The success of this project was crucial to Angola's power supply, as it more than doubled the country's generating capacity. For a project of this magnitude and importance, the directors at GAMEK, owner of the plant, wanted to work with a financially stable corporation with a powerful control system. They chose Emerson Process Management and the Ovation™ expert control system.

The Capanda hydro project was a two-phase process, with two 130-megawatt turbines installed during each phase. The 520-megawatt undertaking was the largest civil engineering project in Angola. Moreover, it was truly a global effort, with business partners coming from Angola, Brazil, Russia, and the United States.

The Capanda hydro project was Emerson's first time working with Optima Moscow, the A/E firm for the project. Together, Optima and Emerson custom-designed the system logics, as well as 20 system-specific graphics. The Ovation system includes GPS time synchronization and a router to create an Ethernet connection with third-party devices. This allows a safe connection to the plant LAN.

By choosing Ovation and Emerson, the Capanda Hydroelectric Power Plant realizes the following benefits:

- High-speed (1 gbps), Fast Ethernet Network that guarantees real-time data transmission without loss, degradation, or delay
- GPS (global positioning system) time sources to maintain synchronization to within +/-1msec resolution through the use of nested clocks.
- Powerful Ovation Controllers to achieve maximum process availability while executing simple or complex modulating and sequential control strategies.
- Expert, structured project management plan that includes a dedicated project engineer to meet every project milestone in a timely and successful manner.