

CASE STUDY

# BYNE



## Operational communication system – Itaipu Binacional

Implementation of an integrated critical communication system in control and supervision rooms

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## The world's leading hydropower plant in energy generation relies on the BYNE ControlONE solution for its critical communication.

Source: ITAIPU.

### THE PROJECT

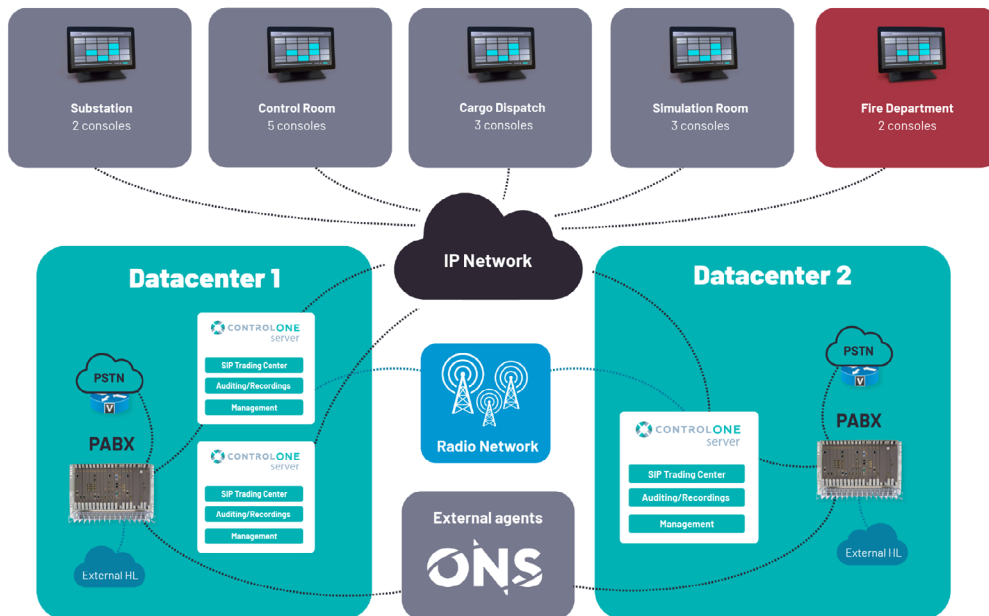
**Communication** is a critical issue for Itaipu Binacional, which supplies electricity to Brazil and Paraguay. To ensure the **high availability** requirement, the company's operation centers include a Central Supervision and Control Room ("CCR"), a Cargo Dispatch Control Room ("SDC"), and the Right Bank Supervision and Control Room. The coordinated work of these teams must meet **high-efficiency requirements** and occur in **real time**. To ensure the high service standard, the BYNE ControlONE critical communication system was implemented in

2014. The project included the installation of **critical communication consoles**, **hotline** integration, and **recording** with an integrated call evaluation system. Recently, the solution to cater to the Itaipu fire department was expanded, making operational communication easier and more agile and secure.

*BYNE's solution modernized ITAIPU Binacional's communication system and integrated all the operation centers, the fire department, and the left and right banks. Moreover, consoles were installed in the training simulator room of the operational teams.*

### PROJECT ARCHITECTURE

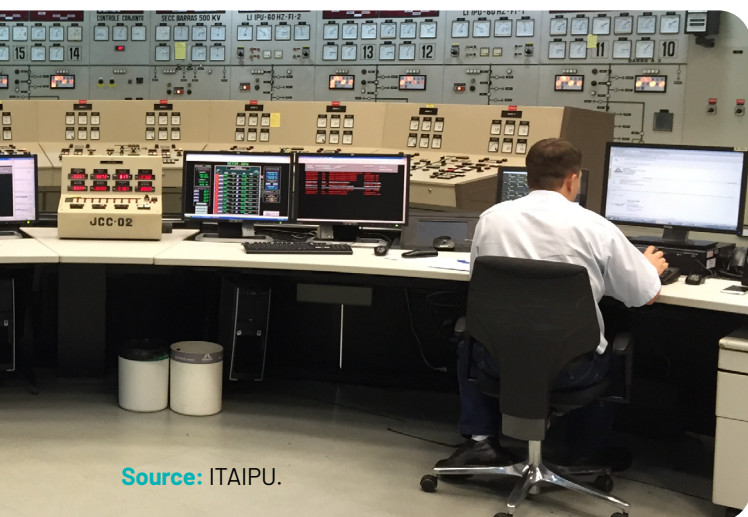
The installed solution comprises Byne ControlONE high-availability servers, telephone switch with 2+2 redundancy, redundant LAN network with optical fiber, 15 consoles with touchscreen screens, and wireless audio devices.



## CHALLENGES

The technology previously installed in Itaipu needed to be modernized. In this case, the project required the following requirements:

- Critical communication system based on IP technology;
- Redundant components to ensure high availability;
- Hardware following market standards, to facilitate future upgrades;
- Redundant IP recording system with web architecture that includes easy consultation, search, listening, and copying for internal and external audit;
- Call evaluation system integrated into the recorder for post-operation team analysis;
- Integration with essential analog circuits (hotlines), corporate ISDN, and SIP trunking;
- Platform with the possibility of future expansion;
- Smooth migration process with minimal impact to operations.



Source: ITAIPU.

## OUR SOLUTION

BYNE provided a solution that met the critical communication requirements of Itaipu Binacional. The project, carried out in partnership with Wecom, included the installation of operation consoles in three control and supervision rooms, a unified communication solution with the public network, internal extensions, and hotlines. Moreover, the infrastructure of fully redundant servers, switches, and telephone exchange was installed.



Source: ITAIPU.

The client-server architecture, as well as hardware independence, makes it possible to easily expand the installed software and server and console hardware. The solution also has integrations via SIP protocol and CSTAv3, which allows operators and dispatchers to monitor the status of hotlines. To ensure that all the benefits of the solution were used efficiently and quickly, training was provided for more than 100 operators

and dispatchers from the three control and supervision rooms, according to the different requirements. In addition, the engineering and maintenance teams were trained to master the solution.

The BYNE solution met all the critical elements of the project, in line with Itaipu Binacional's own indicators.

*BYNE played a strategic role in the project, providing its unique expertise to integrate BYNE ControlONE into the existing hotlines infrastructure, telephone exchange, and switches, and met all the requirements for Itaipu communication.*



Edgar Quadros - Technical Support Analyst

## CLIENT BENEFITS

The solution implemented by BYNE ensured the reliability, availability, and agility required for the critical communication of Itaipu Binacional. The key benefits of the solution include the following:

**No-fuss maintenance:** the periodic care of the solutions is fully monitored through SNMP (Simple Network Management Protocol) and its own dashboards, with an indication of use and capacity, as well as proactive alerts. In case of failures, the terminals can be replaced with minimal impact on the operation.

**High Availability :** the solution has been equipped with a minimum MTBF (Mean Time Between Failures) requirement of 50,000 hours, ensuring uninterrupted operation.

**Integration:** BYNE ControlONE provided integration with digital radio communication, unifying all operational communication on a single platform.

**Extended service life:** the consoles have no moving part, such as fans or mechanical hard drives, which ensures maximum equipment durability, especially in an environment such as CCR, where there is constant vibration.

## ABOUT THE CLIENT

The Itaipu Binacional hydroelectric plant is an international company created by a treaty between Brazil and Paraguay in April 1973. It is a world leader in the production of clean and renewable energy.



Since the start of its operation in May 1984, cumulative production has exceeded 2.7 billion megawatt-hours (MWh). In 2020, the plant supplied 10.8% of Brazil's energy demand and 88.5% of Paraguay's energy demand. The company holds several awards for efficiency, public health accountability, and environmental protection.

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