

CASE STUDY:

CONTROLS UPGRADE ADDS RESILIENCY AND OPERATION FLEXIBILITY.



TOMONI.
Data Foundation and Enablers,
O&M Optimization
Netmation 4S DCS and Major
Equipment Control Systems
Upgraded
Netmation Protect Pack

PLANT DETAILS

- Enel Generación Costanera
- MHI GTCC entered service in 1998
- Full turnkey by MHI
- Buenos Aires, Argentina

EQUIPMENT NOTES

- 2 Mitsubishi M701F Gas Turbines
- 1 Mitsubishi Steam Turbine
- 2 Mitsubishi HRSG
- GTCC major equipment control systems upgraded to DIASYS Netmation 4S with Netmation Protect Pack
- Upgrades installed: Phase 1 2019, Phase 2 2021

CHALLENGE

Enel Generación Costanera is the largest thermal power plant in Argentina, with a natural gas-fueled 851 MW combined-cycle power block that entered commercial operation in 1998. Costanera is strategically located in the heart of Buenos Aires and is one of the most important GTCC plants in South America. Enel has a strong commitment to protect the environment and strengthen energy supply security by extending the useful life of this plant with advanced technology that improves reliability, sustainability and availability. Rapidly evolving advancements in real-time data analytics, remote O&M support and data-driven predictive maintenance challenged the existing two-decade-old control platform.

Keeping the digital control systems of important generating units updated to the latest reliability and cybersecurity standards is always a challenging task. ENEL viewed the upgrade of the Costanera GTCC DCS and power block control systems as a key enabler for digitalization required to support decarbonization, the increased penetration of renewables and long-term sustainability. The challenge was how to implement the upgrade in a preplanned and phased manner that had the least disruption to normal plant operation.

SOLUTION



After a rigorous evaluation, Enel chose an upgrade to Mitsubishi Power's DIASYS Netmation 4S controls platform,

in two phases:

- Phase 1 in 2019 included HMI upgrades using virtualized servers and thin-client displays to improve cybersecurity and mitigate equipment obsolescence, Netmation Protect Pack (NPP) cybersecurity management, OPC Server for plant-wide data management and associated cybersecurity firewalls.
- Phase 2 in 2021 included CPU replacement to higher-capacity triple-redundant controllers and full D-ring-redundant I/O network.

All main systems were modularized, prefabricated and factory-tested with simulation prior to shipment to simplify on-site work and reduce commissioning time. Existing cabinets, I/O terminal panels, sensors and cabling were reused.

The system was designed to support predictive analytics and remote O&M management for the entire plant. Cybersecurity was directly integrated into the design, ensuring that the power plant is protected against the increasing prevalence of cyberthreats.

RESULT

Mitsubishi's experience as a power block equipment and total plant designer, and rigorous preplanning together with Enel, resulted in as-planned execution of this major control system upgrade, which included valve calibrations and combustion tuning during the difficult period of the pandemic. The upgrade was completed early, and startup in combined-cycle mode had no problems.

The Costanera GTCC is now running with improved reliability, fault tolerance and online self-diagnostics. The higher reliability and enhanced maintainability enable long-term cost savings with the ability to more easily integrate future advanced control and remote support technology. This upgrade has added resiliency and operation flexibility to support Enel's reliability and sustainability goals.

“Both phases of the solution implementation were excellently planned and executed by the joint team of Mitsubishi USA and Japan. Not only does this new controls platform improve plant reliability, but it also positions the plant for the future with a comprehensive data infrastructure and cybersecure connectivity to incorporate future advancements in data analytics.”

Alejo Nuin

Plant Manager, Enel Generación Costanera S.A.

TOMONI[®] is a suite of intelligent solutions that accelerates decarbonization with power plant design, O&M and system knowledge, together with strong customer and partner collaborations. TOMONI leverages advanced controls, artificial intelligence and machine learning with multi-layered cybersecurity to make energy systems smarter, more profitable and ultimately more autonomous on the road to a sustainable future.



- Data Foundation & Enablers
- O&M Optimization
- Performance Improvement
- Flexible Operations