AES ANDRES—EMERGENCY BYPASS STACK PROJECT

The AES Dominicana 2x1 combined cycle power plant (319MW) located at AES Andres, Boca Chica suffered a severe lightning strike that caused damage to the facility's control systems and ultimately resulted in a catastrophic failure of the steam turbine with blades breaking loose and escaping the turbine enclosure.

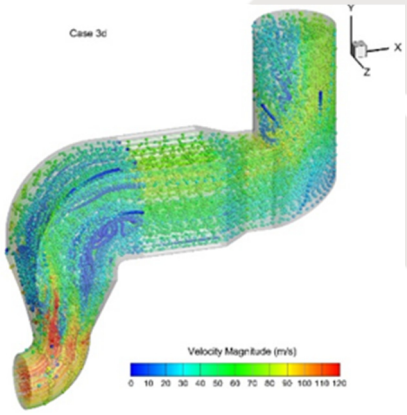
AES Andres, Boca Chica
Dominican Republic

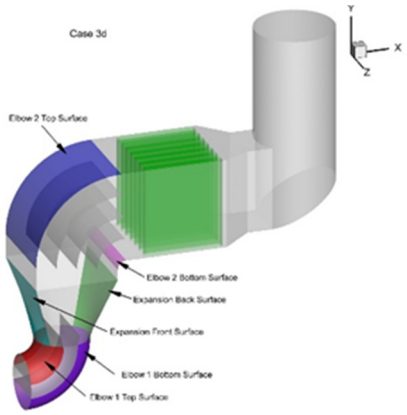
Facility Summary

2 X 1 Combined Cycle Power Plant

319 MW

AES Dominicana





CFD Models

Project Issues

This facility was the largest power plant in the country and the immediate loss of the generation caused grid failures and blackouts within the country. The gas turbines were able to come back on line in steam turbine bypass mode but were limited to part load operation as the plant was constructed without a bypass stack.

The Public Electricity Corporation (CDEEE) reported in the press that the government utilized power from more expensive temporary gas turbine generators in order to compensate for the impact of the part load operation of the AES Dominicana power plant.

McHale Contracted Tasks

In response to the emergency need for power, the Power Service Group (PSG) engaged McHale & Associates to join an engineering consortium to help AES come up with a bypass stack solution so that the gas turbines could be operated at full simple cycle base load while the damage to the steam turbine was being prepared.

Problem Resolution

Between October 2018 and December 2018, McHale played a lead role during the conceptual design of the bypass stack by first conducting plume modeling and stack height analysis for environmental performance compliance. Next, McHale assisted PSG source an appropriate stack & stack silencer, ensuring that the components could be modified for the specific gas turbine utilized at AES Andres. Together with our alliance partner, McHale performed a CFD analysis of the design and coordinated with Tennessee Tech University to conduct Scale Modeling verifications.

McHale coordinated and led the flow design, technical specifications and integrated the construction design team with the structural design. In a highly compressed time frame, McHale coordinated the design team collaboration, design approvals and reviews.

Work Outcome

In a few short months of fabrication and shipping, the bypass stack was successfully placed in service and the gas turbines were able to operate in full load for generation. The full load bypass operation was successfully utilized until the end of the steam turbine repair and the facility was returned to combined cycle operation.

Bypass Stack
(one day before startup)