



Berlin, El Salvador

Facility Summary

Geothermal Power Plant
40 MW

SSD Berlin—Unit 3



SSD BERLIN UNIT 3 —40MW GEOTHERMAL POWER PLANT

McHale conducted a complete review and independent evaluation of the SSD-Berlin Unit 3 El Salvador 40 MW Geothermal Power Plant, which included a complete audit of the flow measurement strategy and equipment implemented by the facility. This included a comprehensive uncertainty analysis and inspection of the calibration information into the flow calculation software of the control system.

Project Issues

The United States Department of State had issued travel warnings for El Salvador regarding security for U.S. citizens.

Problem Resolution

McHale developed a test procedure to conduct the testing scope. It was developed in accordance with existing performance testing guidelines and the client's specifications. This consisted in the development of a testing procedure that included client requirements, including correction curves for all major equipment, including steam turbine thermal kit and exhaust loss curve, a full set of P&ID's and electrical one-line diagrams, design heat balances for the plant and design information for all major equipment.

McHale developed calculations and tables for data reduction and results analysis. The data reduction and results analysis provided:

- Complete mass and energy balance
- Measurements of flows, pressures, and temperatures
- Unit 3 efficiency
- Pump performance as relative to the manufacturer pump curves
- Cooling tower performance based on CTI thermal testing

McHale assembled the proper calculations and tables for data reduction and results analysis. Calculations were performed as per the test procedure. The data reduction and results analysis tools were used to perform on-site, preliminary data reduction and analysis. McHale generated printouts for sample calculations, preliminary results and the final test report.

Work Outcome

During the analysis, McHale discovered and proved misapplications in the DCS control calculation, differential pressure measurement equipment calibration, and fundamental understanding of the two-phase flow on the flow measurement equipment.