Geothermal Plant Generates Clean, Sustainable, Reliable Power

The San Jacinto-Tizate geothermal power plant replaces some costly fossil-fuel imports and offers a significant annual reduction in CO₂ emissions.

The San Jacinto-Tizate geothermal powerplant in Nicaragua powers 15% of Nicaragua’s electricity needs. It is located on the 9,800-acre San Jacinto-Tizate geothermal area, considered one of the most productive volcanic reservoirs in Latin America. “San Jacinto-Tizate geothermal project is benefiting Nicaragua by providing the country with clean, renewable power at lower cost than imported fuel oil,” says Tono Rodgriguez, Latin America head of operations for Ram Power. “This benefits the citizens of Nicaragua by expanding the access to power while reducing costs.”

Polaris Energy Nicaragua (PENSA), a wholly owned subsidiary of Ram Power, developed the project with an international team before stepping into the role of operator. PENSA selected POWER Engineers as its powerplant engineer.

POWER Engineers completed the design, construction documentation and commissioning for the first of two Fuji 36-MW turbine plants in 2011, with operation beginning in 2012. A few months later, POWER returned to Nicaragua to guide the installation of the second Fuji 36-MW turbine, which brought the total project output capacity to 72-MW net.

Energy Abounds at Nashville Music Center

The Music City Center in Nashville, Tenn., produces lots of energy. That energy results from the installation of two 69-kV underground-cable circuits that power the $585-million convention center. To accommodate the facility, Nashville Electric Service (NES) decommissioned their 60-year-old Demonbreun Substation and replaced it with a gas-insulated substation that could be enclosed and hidden from public view. NES designed and built a 3,300-ft tunnel beneath city streets. This allowed them to remove overhead lines and poles, improving the center’s visual appeal.

The 8-ft-dia tunnel required a custom-built tunnel-boring machine. Access to the tunnel is provided by shafts at each end, built at significantly different depths due to grade elevations. The north end rests at 60 ft while the south end drops to 150 ft.

The transmission cables had to maintain a minimum bending radius and accommodate forces produced when the cable heats up and cools down during use. “The cables were hung in a catenary between supports to allow them to expand and contract,” says Mike Mueller, project manager with POWER Engineers.

POWER served on the engineering, procurement and construction team for the cable installation. Brackets were fabricated and anchored into the shafts’ 2-ft-thick concrete walls to clamp the cables which were hung at 10-ft intervals and held in place with clamps capable of withstanding the strong magnetic forces that can occur during a short-circuit event. These supports were also staggered to provide stress relief. “Since the cables are installed in the air—a relatively poor heat conductor—it was important to carefully calculate the current carrying capacity of the circuits,” Mueller says.

The 1.5-million-sq-ft center which opened in May is performing well, and the circuits are handling the power according to plan.

Association Touts Standardized Method for Measuring Sustainability

The classification of sustainability practices has improved considerably since the introduction of Envision™, a standardized framework developed by the Institute for Sustainable Infrastructure (ISI) and the Zofnass Program for Sustainable Infrastructure at the Harvard Graduate School of Design. Envision™ improves a project’s sustainability performance from technical, social, environmental and economic perspectives. Envision™ allows owners and designers to be publicly recognized for collaborating with communities and for using a life-cycle and restorative approach to infrastructure projects.

POWER Engineers’ President Jack Hand says, “Every project that comes across our desks should be looked at with respect to creating a globally sustainable environment. Envision is one way we measure and improve our sustainable practices.”

POWER Engineers is a charter member of ISI. To learn more about ISI, visit: sustainableinfrastructure.org