

SECACAO HYDROELECTRIC PROJECT

Construction Management

The Secacao Hydroelectric Project is a 15.6 MW new hydroelectric development constructed by a private Guatemalan corporation in rural northeastern Guatemala. The project is located on Rio Trece Aguas, about 80 km from the city of Coban. Design conditions are approximately 760 meters of head at a flow of 3.6 cubic meters per second. Water is conveyed from an intake structure via a 42-inch diameter steel penstock approximately 2,500 meters to a powerhouse containing a single two-jet horizontal pelton turbine and a synchronous generator rated at 19,300 kVA. A 65-km transmission line at 69 kV was constructed to deliver the project output to the utility grid. The developers sell all project output to the state utility, INDE, under the terms of a long-term power purchase agreement.



EES Consulting personnel were originally retained to assist in evaluating turbine and generator bids for the project. Based on the large number of alternatives proposed by equipment vendors, EESC staff worked with the client to refine the project design criteria and to develop specifications to provide the vendors with a common basis for bidding. The scope then expanded to include overall project design review, bid document and contract terms and conditions development, contract negotiation, shop drawing reviews and overall construction management and start-up assistance.

EES Consulting staff worked with the owner's engineers to develop a detailed plant operating philosophy to guide both the equipment selection and the overall plant final design. Detailed specifications for the controls system, penstock design and installation, spare parts, operation and maintenance procedures and plant commissioning, start-up and testing procedures were prepared. A complete water-to-wire equipment bid package was developed, including contractual terms and conditions (also developed by EES Consulting staff). The package was rebid and staff performed a detailed bid analysis and award recommendation. EES Consulting staff then participated in detailed negotiations with the apparent low bidder in the USA, Guatemala, and Austria and helped to develop a conformed contract, which was executed on December 20, 1996. EES Consulting staff performed several equipment inspections at the factory during fabrication. Delivery of all equipment was completed in February 1998. A variety of construction management tasks were performed including shop drawing reviews, equipment inspections and insuring conformance with the contract and the specifications. Jack Snyder of EES Consulting spent 3 months at the jobsite providing installation inspection on all equipment and controls and acting as start-up coordinator. The Project has operated very successfully since start-up in 1998.

EES Consulting has recently been retained to perform preliminary design of a small re-regulating reservoir to be constructed just upstream of the project dam to allow the project to maximize on-peak energy production.