

Alaska Energy Cost Reduction Program

Grantee:

Alaska Power & Telephone Company

Project Name:

South Fork Hydroelectric

Authority Contract Number

2195156

Grant Project Completion Report

Background:

Prince of Wales Island (POW) is the third largest island in the United States and lies to the west of the town of Ketchikan in Southeast Alaska. The larger communities on POW are electrically intertied and supplied by power primarily from the Black Bear Lake Hydroelectric project (BBL). The electrical transmission system has been expanded over the last 10 years to include Craig, Klawock, Viking Lumber sawmill, Thorne Bay, Kasaan, Hollis and Hydaburg. These additions along with system load growth have fully utilized the capacity and energy available from Black Bear Lake (BBL) hydroelectric facility and supplemental diesel powered generation has been required increasingly to meet the system loads. To minimize dependency on high cost diesel generated energy, Alaska Power & Telephone (AP&T) began investigating renewable resource energy sources on POW Island. Studies and evaluation of various renewable resource energy projects ultimately led to the selection of South Fork Hydro as the next project for development on POW.

Stream flow and water temperature data collection began in 1997 on the South Fork of Black Bear Creek. This small drainage basin adjacent to the BBL Hydroelectric storage facility showed potential to operate a 2 MW hydroelectric generator providing 7.5 gWh of energy on an average water year. This eliminates approximately 536,000 gallons of diesel fuel per year. Project feasibility was enhanced by the project's close proximity of existing roads, power and communications lines serving the BBL facility. In addition, the project is entirely on private land and exempt from FERC licensing. The environmental impact is very low since the project consists of a very small diversion dam, buried pipeline, compact powerhouse and no fish upstream of the tailrace.

In May of 2001, AP&T applied for grant funding under the Alaska Energy Cost Reduction Projects solicitation AEA-01-110 to design and construct the South Fork Hydro Project. In August of 2002, AP&T entered into a grant/loan agreement with the AEA to fund the project. Design, permitting and revisions to the loan and security agreements delayed the beginning of construction until the spring of 2004.

Activities:

AP&T was the general contractor on the project, securing the necessary permits, providing engineering design and constructing the project with their own work force and seasonal labor.

Long lead time materials, turbine, generator and penstock were ordered in April 2004. Roads and sedimentation pond were completed by June 2004. The penstock was substantially completed by October 2004 and the diversion dam by March 2005. The powerhouse building and tailrace were completed in July 2005. Powerhouse equipment, transmission line and substation were installed and commissioned by November 2005.

Project Cost:

AEA Grant	\$1,896,932
AEA Power Projects Loan Fund	\$1,645,868
Alaska Power & Telephone	\$430,880
Total Project Budget	\$3,973,680
Labor Costs	\$1,301,494
Direct Materials	\$1,767,896
Other Materials	\$790,284
Vehicle Costs	\$114,006
Total Project Cost	\$3,973,680
Total Electrical Capacity (kW)	2,000

Project Outcomes:

The run-of- river South Fork Hydroelectric facility has already accumulated over 1000 hours of operation supplementing the BBL facility. The power plant controls have been incorporated into the BBL SCADA system enabling plant operators to remotely monitor and control the new facility. While South Fork Hydro has limited storage capacity, it will significantly reduce the energy requirement from BBL enabling BBL to maintain water in storage for low rainfall periods. This will significantly reduce the area's dependence on diesel generated energy.

Problems Encountered:

Initial testing turned up several problems with the turbine, generator and hydraulic unit that created significant commissioning delays due to warranty issues and issues associated with multinational equipment supply. None of these were major problems, and the plant has performed as planned.

Conclusions and Recommendations:

The project is a very valuable asset that will reduce energy costs by providing environmentally clean renewable resource energy for the interconnected communities on Prince of Wales Island.