

HALL OF FAME

LaBarge Dam and Powerhouse: Crossing into a New Century

The 850-kW LaBarge Dam and Powerhouse, the Hydro Hall of Fame inductee for 2001, continues to generate hydropower for three small communities in southwestern Michigan 100 years after it first began operating. The facility has endured two energy crises and has changed ownership three times, yet it still serves the function for which it was created. LaBarge stands as a proud reminder of hydropower's enduring quality.

By Scott D. Goodwin

When three businessmen in Grand Rapids, Michigan, opened the LaBarge Dam and Powerhouse in southwestern Michigan in 1901, they were not thinking about operating a power plant that would endure for more than 100 years. Wesley Hyde, S.D. Kopf, and Charles Mercer only knew that local manufacturers and residents were clamoring for change in the sleepy towns of Caledonia, Hastings, and Nashville. City leaders believed that electricity would improve the profitability of local manufacturing plants, which were powered by steam at the time. City streets lit with electric lighting would foster residential growth in the small towns. And, wealthy residents pushed for electric service so they could enjoy the convenience of electric appliances. The three men believed that providing the area with electricity could prove to be a fruitful business venture.

Kopf used his expertise gained as vice president of M.B. Wheeler Electric Co. to guide daily operations of the company, which was christened the Thornapple River Electric Light and Power Co. Hyde was principal stockholder of the company. Mercer also owned a sizable chunk of the \$100,000 shares of stock issued by the company. Kopf, an electrician and general manager of the fledgling company, bought the electrical

equipment from manufacturers in Chicago. Kopf moved from Grand Rapids to Hastings in 1901 to be closer to the dam and powerhouse. He directed the small company's



The 850-kW LaBarge Dam and Powerhouse, built in 1901 at the site of a sawmill, brought electricity and a more modern way of life to residents and local manufacturers of three communities in southwestern Michigan. (Photo courtesy Caledonia Historical Commission)

affairs from a tiny storefront office in Hastings. The town of Hastings signed a five-year street lighting contract with the company. The other towns soon followed.

The entrepreneurs hired construction crews to erect a timber-crib dam, with 18 feet of head, on the Thornapple River. The powerhouse was constructed of wood on property previously occupied by the LaBarge Sawmill in the center of the town of Caledonia. The new power plant boasted 850 kW of installed capacity. The equipment consisted of one horizontal double runner unit and one

vertical Francis unit.

The plant continued to generate power from 1901 to 1940. Details about its operation during this time are not available.

By the 1940s, the three entrepreneurs were nearing retirement age and decided to get out of the power generation business. They sold

LaBarge Dam and Powerhouse to Consumers Power Company, which was acquiring many small facilities in the area at the time. Consumers operated the plant until 1965. The

utility shut down the plant that year because other power generation methods proved less expensive.

All of the vertical unit equipment – except for the penstock, head gate, and draft tube – was removed presumably for use in other Consumers power plants. Most of the horizontal unit equipment remained intact, except for the governor and hydraulic system, the D.C. exciter, the copper from the generator, and the switch panels.

What remained of the powerhouse was sold, along with the dam, to Commonwealth Power in 1982. No



In the early 1980's, the exterior of the LaBarge powerhouse was modernized, and the original horizontal Francis unit was retrofitted. Today, the project – after 100 years – continues to generate clean, renewable electricity.

Maintenance had been done on the plant since 1965. Robert Evans, an attorney in the power industry and Commonwealth's owner, was known for rebuilding aging hydropower plants throughout southern Michigan. He purchased LaBarge and other hydro plants in part to benefit from the accelerated depreciation, energy and investment tax credits, and incentives offered under the Public Utilities Regulatory Policy Act of 1978. The law, known as PURPA, requires utilities to buy power from independent companies that can produce power for less than what it would cost those utilities to generate it.

Evans hired Wesley Scott from

Whites Bridge Hydro, based in Brighton, Michigan, to restore LaBarge and upgrade the equipment. The wood frame powerhouse was replaced by a steel-frame, metal panel structure. The existing concrete turbine pit and tailrace were left intact. The 550-kW Allis Chalmers generating unit was retrofitted into the existing turbine pit, and once again produced 740 horsepower. Scott and his crew replaced the guide bearings, thrust bearings, and the radial gate seals. They installed new hydraulic units, electrical panels, and a gantry service crane. The crew removed sediment that had collected around the generator pit. They also installed a

used vertical Leffel 36 Z turbine and a used Electric Machinery generator, and installed a surge tank for the vertical turbine.

American Energy, Inc. purchased Commonwealth Power in April 2000. The hydropower generated at LaBarge is sold under a wholesale electricity contract to Consumers Energy (formerly Consumers Power). In October 1998, Commonwealth signed a tentative agreement to transfer the land surrounding the dam and powerhouse to Caledonia township to be used as a public park. Commonwealth retains the rights to the dam and powerhouse.

The 2001 inductee into the Hydro Hall of Fame – LaBarge Dam and Powerhouse – is generating electricity today much as it did 100 years ago. Built on the site of a nineteenth century sawmill, the historic LaBarge facility has continually transformed the flow of the Thornapple River into valuable benefits for citizens in surrounding communities. The plant's continued operation pays tribute to the enduring strength of hydropower.

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Technical Information LaBarge Dam and Powerhouse

General Information

Location: On the Thornapple River approximately 12 miles southeast of Grand Rapids in Michigan
 Owner: American Energy, Inc.
 Capacity: 850 kW
 Head: 18 feet
 Average Streamflow: 410 cfs
 Average Annual Generation: 4,650 MWh

Equipment

Turbines (2)
 Unit 1: (original to the plant)
 Francis turbine
 Manufactured by Allis Chalmers
 Rated at 740 horsepower

Unit 2:
 Francis turbine vertical 36 Z runner
 (Original: Francis turbine vertical runner)
 Manufactured by James Leffel
 (Original unit had been manufactured by Allis Chalmers)
 400 horsepower (both original and replacement)
 150 rpm (both original and replacement)

Generators (2)

Unit 1:
 610 kVa, 550 kW
 60 cycle, 150 rpm, 3 phase
 Unit 2:
 340 kVa, 300 kW
 60 cycle, 165 rpm, 3 phase

Construction

Intake
 Powerhouse
 31 feet wide
 41 feet long
 40 feet tall
 Concrete
Draft Tubes
 Unit 1: Concrete-elbow draft tube 9 feet in diameter
 Unit 2: Steel vertical draft tube 6 feet in diameter
Transmission
 Transmission line runs approximately 70 feet underground to the Consumers Energy substation located next to the powerhouse