

Stairs Station:

*Competing for the Power Market
100 Years Ago*



The Stairs Station southeast of Salt Lake City, Utah, turning 100 years old in 1995, can be discussed only in connection with the Granite Station, 2 miles downstream. (Granite turns 100 in 1996.) In the early days, the two facilities were intense competitors.

In 1895, when Stairs was completed, Utah still was one year away from statehood. The hydroelectric industry in the territory was in its infancy, with some 60 companies operating small, isolated hydro plants scattered throughout sparsely populated mountain canyons.

The vast majority of the plants were built to serve a specific, local need: a mine, a mill, a small town. In the case of Stairs, its electricity was fed three miles into downtown Salt Lake City to the electric trolley system. The contract to serve the city was the reason for the early tensions between the two small companies building Stairs and Granite.

R.M. Jones, a Salt Lake City civil engineer and inventor, studied the hydropower possibilities of Big Cottonwood River and its canyon, and in 1893 applied to city officials for a franchise. He named his company Utah Power, and began construction of: a diversion dam a mile above the Stairs site; a flume down the mountain; and the Stairs facility itself.

Another group of men, all with financial interests in the city's street car system, began construction of another power plant (Granite) near the mouth of the canyon. One of the men, Frank H. Gillespie, claimed prior rights on the river, and vehemently protested the activities of Utah Power.

After Stairs was completed and producing electricity, Gillespie and his men tried a late-night gamble to hurry Granite into production. During that night, they constructed a flume over the dam at the Stairs plant, planning to draw water from



Intense competition existed between small power companies in the 1890s. During construction of the Stairs and Granite hydro-power stations near Salt Lake City, Utah, such competition erupted in late-night sabotage. The companies hired guards armed with shotguns to protect their property.

the pool to turn the turbine at Granite.

According to an article in the February 4, 1896, edition of *The Salt Lake Tribune*, the flume disappeared the next night at the hands of a Utah Power crew led by a man named Francis Armstrong. The story reported: "Mr. Gillespie's men were completely routed and a flume which they had constructed over the Utah Power company's dam during the preceding night was demolished and destroyed by sledges and axes in the

hands of the company's ... determined men. While the work was being carried on, Mr. Armstrong and one of his assistants stood by fondling double-barreled shotguns."

Based on legends from the era, other acts of late night sabotage occurred, leading both factions to post armed guards each night. It is not known how peace, or co-existence, was achieved between the two groups, but it was. Granite went on line in 1896, using water that flowed through a flume from the Stairs diversion dam.

The system of small, isolated hydroelectric plants serving specific needs lasted only another decade or two. Each had a limited market, which could disappear if a mine played out or a mill burned, and equally limited power supplies and capital. In 1912, Utah Power & Light Co. (UP&L)—now a subsidiary of PacifiCorp—was formed, and gradually bought out the small plants. It built bigger, more modern plants and created one integrated grid. It is the current owner of both the Stairs and Granite hydro stations.

Dave Graham, hydro foreman for UP&L, said Stairs and Granite can operate independently of one another, but form a coordinated unit in sharing water from the Big Cottonwood River. Electric power from both plants is transmitted to the Butlerville Substation at the base of the canyon. This substation supplies power to the Brighton Ski Resort 12 miles up the canyon. When the resort



This open wooden flume connects Utah Power & Light Co.'s Stairs and Granite hydroelectric plants in Big Cottonwood Canyon southeast of Salt Lake City, Utah. UP&L employee Bill Lindsay caulks the wood in this circa 1955 picture.

Technical Information

Stairs Station

General Information

Location: 3 miles southeast of Salt Lake City, Utah, on the Big Cottonwood River

Owner: Utah Power & Light Co., of Salt Lake City

FERC License: 597

Capacity: 1.2 MW

Head: 357 feet

Expected Annual Generation: 4,789 megawatt-hours

On-Line Date: 1895

Equipment

Turbine (1 unit)

S. Morgan Smith horizontal Francis

600 rpm

1,500 horsepower

Generator (1 unit)

Westinghouse

3 phase; 60 Hertz; 2400 volts

Construction

Intake

Concrete structure with screen and gate valve; riveted steel pipe to surge tank

Powerhouse

Two-story brick building
33 feet wide; 90 feet long

Draft Tubes

Steel pipe through concrete floor
Wood formed concrete box emptying into tailrace

Transmission

2,300-volt to 12,500-volt above ground lines to Utah Power & Light Butlerville Substation

water. Granite is fed, primarily, by a rectangular, open wooden flume, 5 feet wide and 4 feet high, from the Stairs Diversion Dam. The flume follows the contour of the mountain for nearly 2 miles. The maximum flow through the flume is 48 cfs.

The 1.2-MW Stairs plant was modernized and automated in 1956. When generator windings at Granite burned in 1980, that plant was also modernized and automated.

Beyond 100

The criterion for selection of inductees for the Hydro Hall of Fame this year was facilities that, in 1995, have been engaged in hydroelectric power production for 100 years. We are aware of three additional facilities that have been operating for more than 100 years. They are:

— **Fulton.** This 1.25-MW plant on the Oswego River in Fulton, New York, was commissioned in 1884. The powerhouse initially was equipped as a direct current plant for arc lighting. By the turn of the century, it was fitted with alternating current generators. Owned by Niagara Mohawk Power Corporation, the site was first developed in 1823 when the Oswego Canal Company constructed a canal to channel water from the river to provide mechanical power.

— **Georgetown Hydro.** This 1.5-MW plant on South Clear Creek in Georgetown, Colorado, was commissioned in 1893. Its owner, Public Service Company of Colorado, was known as Denver Gas and Electric Co. when Georgetown was built. The facility originally was equipped with one unit; a second was added in 1900 to raise the capacity to its current rating.

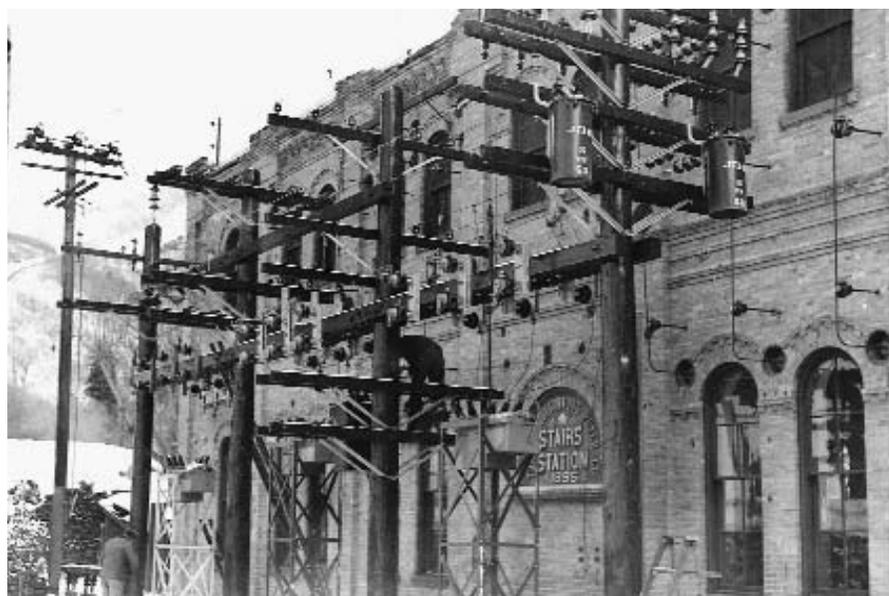
— **Mill Creek #1.** This 940-kW plant on Mill Creek in Mertone, California, is owned by Southern California Edison. The facility began operating in 1893. Forty years later, a new horizontal Pelton unit replaced the original equipment.

If you are aware of other facilities 100 years old or older, or plants anticipating a 100-year celebration in the near future, we'd appreciate you alerting us.



was built in the 1940s, Stairs and Granite supplied all of the power necessary to operate the resort's ski lifts, but the larger and more numerous ski lifts in operation now require more power than the two can generate.

The coordination of Stairs and Granite, both run-of-the-river facilities, begins at the Storm Mountain Diversion Dam, 1 mile above Stairs. Water flows from the dam down the mountain to Stairs in a 48-inch-diameter pipe that becomes a 48-inch-diameter penstock. This conduit can carry a maximum flow of 52 cubic feet per second (cfs) of



The 1.2-MW Stairs hydroelectric station on the Big Cottonwood River southeast of Salt Lake City, Utah, was modernized and semi-automated in the mid-1950s. The plant has been in continuous operation since its construction in 1895.