A NATIONAL HISTORIC MECHANICAL ENGINEERING LANDMARK

ROCKY RIVER PUMPED-STORAGE HYDROELECTRIC STATION

New Milford, Connecticut

September 13, 1980

The American Society of Mechanical Engineers

A Century of Service

1880 ★ 1980

In the beginning, the Housatonic was a straight river, rising in western New York State below the Great Lakes Region, and flowing southeasterly to the sea. In those prehistoric days, the Hudson was probably a tributary of the Delaware River which encroached its way northward until it intercepted and stole the Housatonic's head waters.

Today, the Housatonic is about 148 miles long, from its source near Washington Station in Massachusetts, to its mouth at Stratford, Connecticut, where it empties into Long Island Sound. About 83 miles are in Connecticut, and from the Massachusetts-Connecticut state line to Shelton the river drops about 645 feet. From Shelton to the Sound the river is tidal.

Indians of the Mohegan family of the great Algonquin race, who migrated from the Hudson Valley, were the first inhabitants of the Housatonic Valley and gave the river its name, "the place beyond the hills", in their language.

Captain Adrian Block, a Dutch explorer, was the first white man to see the river when, in 1613, he sailed down Long Island Sound from New Amsterdam. Block called it the "River of the Red Hills" but the Indian name—Housatonic—is the one that endured.

In 1639, the English built the first two plantations at the mouth of the river and other settlements continued until 1780 when all 47 towns now existing in the valley had been established.

Since the earliest colonial days, the Housatonic River has been a source of power. The first dams were built to operate gristmills and sawmills.

As the nineteenth century drew to a close, hydroelectric power and electrical transmission began to replace some of the hydro-mechanical power then in use.

The first hydroelectric plant in New England was built in 1889 on the Farmington River in Connecticut, and electricity generated was carried to Hartford over one of the first long-distance, aluminum wire transmission lines in the country. The world's first hydroelectric station went into operation at Appleton, Wisconsin, seven years earlier. These were small-scale experimental facilities and the first large-scale hydroelectric development did not go into service until 1895 when the first Niagara Falls plant began operating.

It was not until the fall of 1902 that construction was started on the first large hydroelectric station in Connecticut and one of the first in the country. Located on the Housatonic River in New Milford, the Bulls Bridge plant went into service in 1903.

In the early part of the 1900s, other hydro plants were built on the Housatonic. The Falls Village plant of the Connecticut Power Company in Canaan began producing electricity in 1914 and The Connecticut Light and Power Company's Stevenson Station on the Housatonic went into operation in 1919.

With the completion of the Stevenson project there was more than 30,000 kilowatts of generating capacity installed on the Housatonic but only a small portion of this was firm capacity. Unlike the Niagara River, with its large drainage area and the regulatory effect of the Great Lakes, the Housatonic has a very irregular flow, varying considerably from season to season and year to year.

To firm up the existing and proposed hydro capacity on the river, some natural or artifical means for regulation of the river was needed. Rocky River, the first large-scale pumped-storage development in the United States, seemed to be the answer.

As early as 1917, three plans had been considered, one for storage only, which could not be economically justified, and two with larger storage capacity and pumps located just below the Bulls Bridge powerhouse.

In 1926, a plan for generation and pumping was adopted and work started. The development was unusual at the time because it was the first of its type in the United States.

The first known pumped-storage development was in Zurich, Switzerland, in 1882, which was hydro-mechanical until 1891 and the first in the United States, also hydro-mechanical, was about 1885.

At that time, the Rocky River traveled north through the hills, passed through the village of Jerusalem, and ran into the Housatonic north of the center of New Milford.

To flood the Rocky River basin, 5,420 acres had to be prepared. There were four ponds, Squantz, Barse, Crick and Neversink. The valley was occupied by farms, homes, schools, churches, and two cemeteries. It was necessary to abandon homes, relocate highways and cemeteries and clear timber and brush from 4,500 acres below to 440 contour line.

Construction of the main dam and power plant, along with four smaller dikes, began in 1926.

Construction was under the direction of the United Gas Improvement Company of Philadelphia. A construction camp near the dam site housed 600 men, and four smaller camps were located throughout the basin. Known as UGI-ville, the community consisted of houses, shops, a mess hall, offices and other buildings. As many as 1,000 men worked on construction which was completed in 1928.

The main dam is located on Rocky River about one mile above its confluence with the Housatonic River. An earth-filled dam with a concrete and timber core wall, it is 952 feet long and has a maximum height of 100 feet.

To take care of some low points in the rim of the basin, five smaller dams or dikes were needed. Two are located near Danbury and three others near Lanesville.

Near the main dam is a 3,190-foot canal leading from the reservoir to the intake. The canal dike is practically an extension of the main dam.

The station's penstock, partially built of wood staves, runs from the canal dike down the hillside 1,007 feet to a surge tank and from there extends 670 feet to the powerhouse located on the west bank of the Housatonic River. In 1965, after 34 years of service, the original wooden penstock section was replaced.

Inside the station electricity is generated by a 38,430 horsepower vertical shaft Francis reaction type turbine connected directly to the generator.

The station's two original pumps were 8,100-horsepower each, 54 inches, vertical shaft, single inlet, single-stage centrifugal volute pumps with a rating of not less than 112,500 gallons per minute (250 cubic feet per second) delivered against a maximum head of 240 feet. When installed, they were the largest in the United States.

The generator was rated at 30,000 kilovolt-amperes, 24,000 kilowatts at 80 percent capacity factor, 3-phase, 60-cycle, 13,900 volts, 36 poles, 200 revolutions per minute.

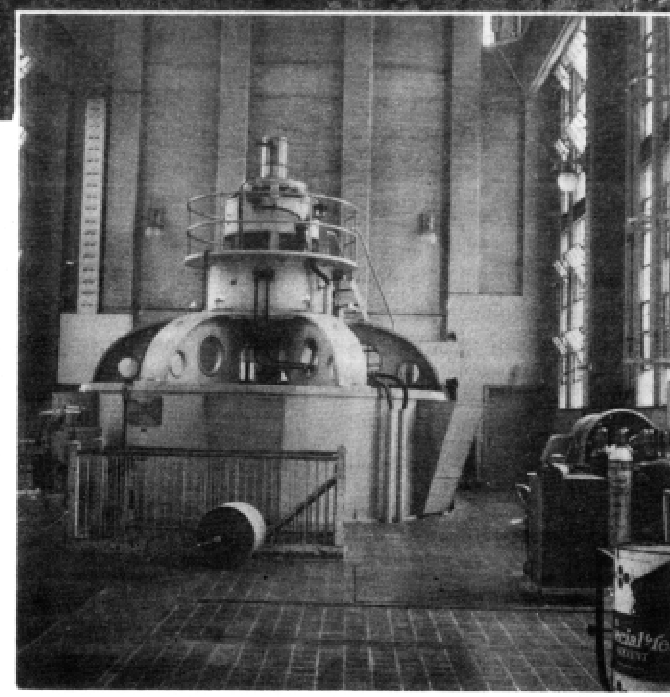
From the time it went into operation, it was recognized that with some loss of efficiency, the station's two large pumps could be operated in reverse to act as generators. In 1951, the necessary modifications were made and the output capability of the plant was increased to 31,000 kilowatts.

The station's upper reservoir, Lake Candlewood, was named for nearby Candlewood Mountain. The largest man-made lake in the state, it covers more than eight square miles, is about 11 miles long, has more than 60 miles of shoreline and holds more than 6 billion cubic feet of water.

Five towns, Brookfield, Danbury, New Fairfield, New Milford, and Sherman border the lake. Recreational facilities operated by these towns and the state of Connecticut surround the lake along with hundreds of private homes and commercial establishments.

Pumped-storage facilities, while they cannot meet the long-term needs for electricity, provide economical generation during periods of high use. In the case of Rocky River, there is an additional advantage. Water used to generate electricity there is also used to generate electricity at two other hydroelectric stations located downstream.

Now more than 50 years old, the Rocky River station still provides customers with electricity at less cost than that which must be produced from oil. During winter months, Rocky River is operated for extended periods in an effort to reduce the amount of oil needed to meet the electric needs of consumers in Connecticut and western Massachusetts.



National Historic Mechanical Engineering Landmark Program

In September 1971, the ASME Council reactivated the Society's History and Heritage program with the formation of a National History and Heritage Committee. The overall objective of the committee is to promote a general awareness of our technical heritage among both engineers and the general public. A charge given the committee is to gather data on all works and artifacts with a mechanical engineering connection which are historically significant to the profession—an ambitious goal, and one achieved largely through the volunteer efforts of the Section and Divisions History and Heritage Committees and interested ASME members.

Accordingly, two major programs are carried out by the Sections and Divisions under the direction of the National Committee: 1) a listing of industrial operations and related mechanical engineering artifacts in local Historic Engineering Records; and 2) a National Historic Mechanical Engineering Landmark program. The former is a record of detailed studies of sites in each local area; the latter is a demarcation of local sites which are of national significance—people or events which have contributed to the general development of civilization.

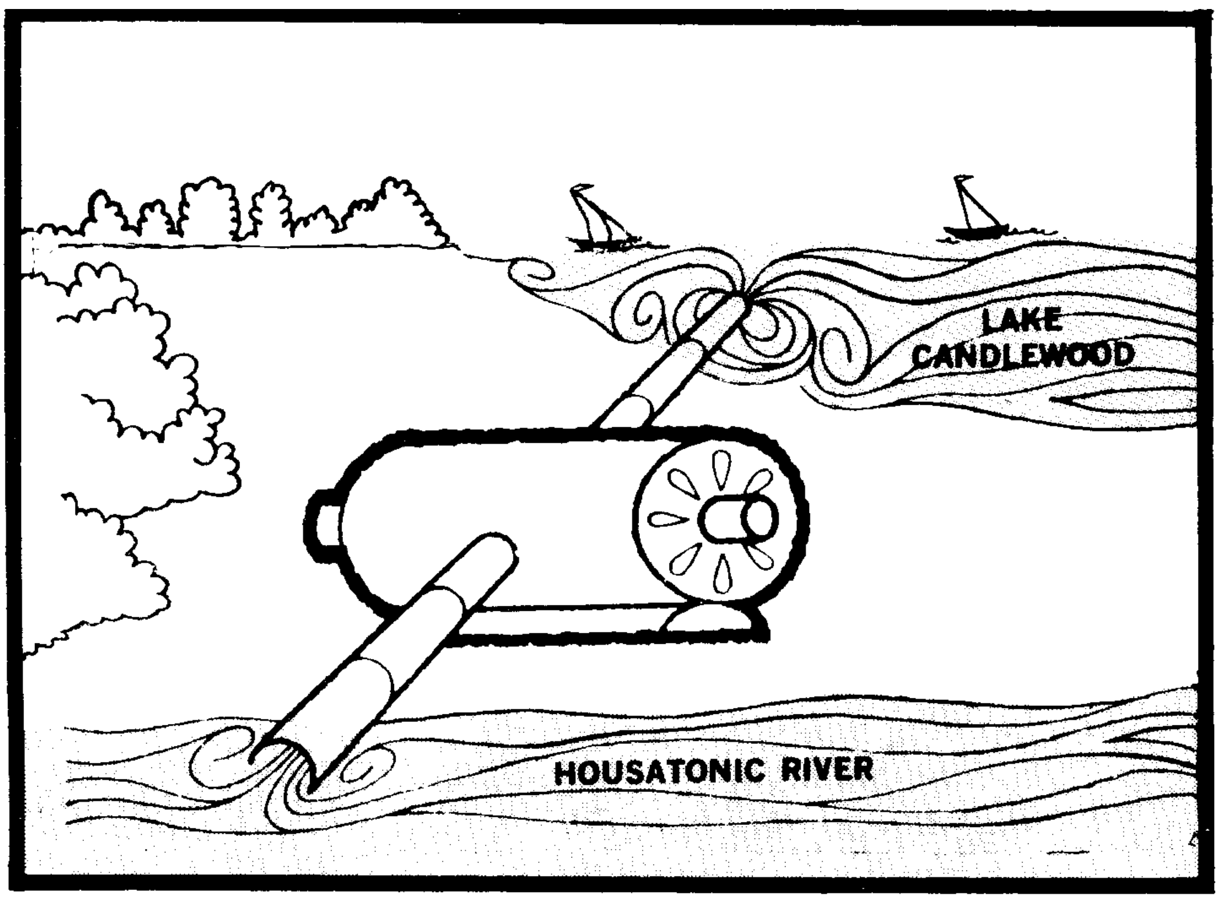
In addition, the Society cooperates with the Smithsonian Institution in a joint project which provides contributions of historical material to the National Museum of History and Technology in Washington, D.C. The Institution's permanent exhibition of mechanical engineering memorabilia is under the direction of a curator, who also serves as an ex officio member of the ASME National History and Heritage Committee.

The Rocky River Station, New Milford, Connecticut is the fifty-second landmark to be designated since the program began in 1973. The others are:

Ferries and Cliff House Cable Railway Power House, *San Francisco, CA*
Leavitt Pumping Engine, Chestnut Hill Pumping Station, *Brookline, MA*
A.B. Wood Low-Head High-Volume Screw Pump, *New Orleans, LA*
Portsmouth-Kittery Naval Shipbuilding Activity, *Porthmouth, NH*
102-inch Boyden Hydraulic Turbines, *Cohoes, NY*
5000-kW Vertical Curtis Steam Turbine-Generator, *Schenectady, NY*
Saugus Iron Works, *Saugus, MA*
Pioneer Oil Refinery, *Newhall, CA*
Chesapeake & Delaware Canal, Scoop Wheel and Engines, *Chesapeake City, MD*

U.S.S. Texas, Reciprocating Steam Engines, *Houston, TX*
Childs-Irving Hydro Plant, *Irving, AZ*
Hanford B-Nuclear Reactor, *Hanford, WA*
First Air Conditioning, Magma Copper Mine, *Superior, AZ*
Manitou and Pike's Peak Cog Railway, *Colorado Springs, CO*
Edgar Steam-Electric Station, *Weymouth, MA*
Mt. Washington Cog Railway, *Mt. Washington, NH*
Folsom Power House #1, *Folsom, CA*
Crawler Transporters of Launch Complex 39, *J. F. K., Space Center, FL*
Fairmont Water Works, *Philadelphia, PA*
U.S.S. Olympia, Vertical Reciprocating Steam Engines, *Philadelphia, PA*
5 Ton "Pit-Cast" Jib Crane, *Birmingham, AL*
State Line Generating Unit #1, *Hammond, IN*
Pratt Institute Power Generating Plant, *Brooklyn, NY*
Monongahela Incline, *Pittsburgh, PA*
Duquesne Incline, *Pittsburgh, PA*
Great Falls Raceway and Power Station, *Patterson, NJ*
Vulcan Street Power Plant, *Appleton, WI*
Wilkinson Mill, *Pawtucket, RI*
New York City Subway System, *New York, NY*
Baltimore & Ohio Railroad, *Baltimore, MD*
Ringwood Manor Iron Complex, *Ringwood, NJ*
Joshua Hendy Iron Works, *Sunnyvale, CA*
Hacienda La Esperanza Sugar Mill Steam Engine, *Manati, PR*
RL-10 Liquid-Hydrogen Rocket Engine, *West Palm Beach, FL*
A.O. Smith Automated Chassis Frame Factory, *Milwaukee, WI*
Reaction-Type Hydraulic Turbine, Morris Canal, *Stewartsville, NJ*
Experimental Breeder Reactor 1 (EBR-1), *Idaho Falls, ID*
Drake Oil Well, *Titusville, PA*
Springfield Armory, *Springfield, MA*
East Wells Power Plant, Oneida St. Station, *Milwaukee, WI*
Watkins Woolen Mill, *Larson, MO*
C-E First Welded Steam Drum, *Chattanooga, TN*
Georgetown Steam Plant, *Seattle, WA*
Equitable Building, *Portland, OR*

Shippingport Atomic Power Station, *Pittsburgh, PA*
Edison Jumbo #9, *Greenfield Village, Dearborn, MI*
Marine-Type Triple Expansion, *Greenfield Village, Dearborn, MI*
Port Washington Power Plant, *Port Washington, WI*
CFR Engine (1st International Landmark), *Waukesha, WI*
Saturn V Rocket, *Cape Kennedy, FL*
Blood Heat Exchanger, *Buffalo, NY*
Rocky River Hydro Power Plant, *New Milford, CT*



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