UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
EVALUATION/RETURN SHEET

REQUESTED ACTION: NOMINATION

PROPERTY NAME: Mechanicville Hydroelectric Plant

MULTIPLE NAME:

STATE & COUNTY: NEW YORK, Saratoga

DATE RECEIVED: 10/11/89
DATE OF 16TH DAY: 11/10/89
DATE OF WEEKLY LIST:
DATE OF PENDING LIST: 10/25/89
DATE OF 45TH DAY: 11/25/89

REFERENCE NUMBER: 89001942

NOMINATOR: STATE

REASONS FOR REVIEW:

APPEAL:	N	DATA PROBLEM:	N	LANDSCAPE:	N	LESS THAN 50 YEARS:	N
OTHER:	Y	PDIL:	N	PERIOD:	N	PROGRAM UNAPPROVED:	N
REQUEST:	N	SAMPLE:	N	SLR DRAFT:	N	NATIONAL:	N

COMMENT WAIVER: N

✓ ACCEPT ___ RETURN ___ REJECT 11/13/89 DATE

ABSTRACT/SUMMARY COMMENTS:

Very well researched and written nomination which clearly demonstrates the exemplary significance of the Mechanicsville Plant in the fields of industry, architecture and engineering.

RECOM./CRITERIA Accept A+C
REVIEWER Sanger
DISCIPLINE Architectural History
DATE 11-13-89

DOCUMENTATION see attached comments Y/(N) see attached SLR Y/(N)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
NATIONAL REGISTER OF HISTORIC PLACES
REGISTRATION FORM

OMB NO. 1024-0018, NPS FORM

This form is for use in nominating or requesting determinations of eligibility for individual properies or districts. See instructions in Guidelines for Completing National Register Forms (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets. Type all entries.

1. Name of Property

historic name Mechanicville Hydroelectric Plant
other names/site number

2. Location

street & number NYS Route 32 | | not for publication
city, town Mechanicville |X| vicinity
state New York code 036 county Rensselaer/Saratoga code 083/091 zip code 12188

3. Classification

Ownership of property
[X]private
[ ]public-local
[ ]public-State
[ ]public-Federal

Category
[ ]building(s)
[X]district
[ ]site
[ ]structure
[ ]object

Number of resources within property

Contributing	Noncontributing	
1		buildings
		sites
3	1	structures
		objects
4	1	Total

Name of related multiple property listings:

Number of contributing resources previously listed in the National Register n/a

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this [X] nomination [ ] request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, this property [X] meets [ ] does not meet the National Register criteria. [ ] See continuation sheet.

Julia J. Stokes 8/2/89
Signature of certifying official Date
Deputy Commissioner for Historic Preservation
State or Federal agency and bureau

In my opinion, the property [ ] meets [ ] does not meet the National Register criteria.
[ ] See continuation sheet.

Signature of commenting or other official Date

State or federal agency and bureau

5. National Park Service Certification

I hereby, certify that this property is:
[✓] entered in the National Register.
[ ] See continuation sheet.
[ ] determined eligible for the National Register. [ ] see continuation sheet.
[ ] determined not eligible for the National Register.

[ ] removed from the National Register.
[ ] other, (explain:)

Beth G. Savage 11-13-89
for Signature of keeper Date of Action

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
NATIONAL REGISTER OF HISTORIC PLACES
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		Contributing	Noncontributing
[X]private	[ ]building(s)	1	buildings
[ ]public-local	[X]district		sites
[ ]public-State	[ ]site	3	1 structures
[ ]public-Federal	[ ]structure		objects
	[ ]object	4	1 Total

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Signature of certifying official — Date 8/2/89
Deputy Commissioner for Historic Preservation
State or Federal agency and bureau

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[ ] determined eligible for the National Register. [ ] see continuation sheet.
[ ] determined not eligible for the National Register.
[ ] removed from the National Register.
[ ] other, (explain:)

Signature of keeper — Date of Action

6. Function or Use

Historic Function (enter categories from intructions)	Current Functions (enter categories from instructions)
Hydroelectric power plant	Hydroelectric power plant

7. Description

Architectural Classification enter categories from instructions)	Materials(enter categories from instructions)
Industrial, Queen Anne	foundation reinforced concrete walls brick/reinforced concerte roof metal other

Describe present and historic physical appearance.

Mechanicville Hydroelectric Plant is located on the west side of the Hudson River in the Town of Half Moon, Saratoga County, New York, (USGS Mechanicville Quad; UTM 18.607990. 4748910) two miles south of Mechanicville and 17 miles north of Albany on the east side of U.S. Route 4 (NY Route 32).

The boundary for the nominated property 18.25 acre parcel of land bounded on the west by U.S. Route 4 and on the east by the west bank of the Hudson River. The nominated boundary then bridges the river between its west bank and Bluff Island (Champlain Canal Lock No. 2). The boundary continues on the east side of the island to encompass all structural elements of the eastern dam which terminates on the eastern bank of the river. The discontiguous boundary excludes Bluff Island. The island, once owned by the power company, is now owned by the State of New York and functions as Lock 2 of the Champlain Canal. Although the lock itself may be eligible for listing in the National Register of Historic Places it retains virtually no integrity in relationship to the context established for the hydroelectric facility. Due to this loss of association and physical integrity from the period of significance, the island has been excluded from the proposed boundary.

The nominated property covers approximately 18.25 acres and incorporates four principal elements: one building (the powerhouse) and three structures (an earth embankment, a concrete non-overflow dam, and a 700' long concrete gravity overflow dam. The embankment, powerhouse, and non-overflow dam span the western channel of the Hudson, between the Saratoga County shore and Bluff Island, located about one-third of the way across the river's width. The spillway section stretches from Bluff Island to an abutment on the eastern bank of the river in the town of Schaghticoke.

The building and associated structures were all built in 1897-98 by the Hudson River Power Transmission Company. Hydraulic and electrical machinery, installed 1897-98 with modifications in 1903 and after, are integral elements contributing to the plant's historical significance.

A transformer yard, located within the proposed boundary, 200' southwest of the powerhouse, was installed by Niagara Mohawk Power Corporation in the 1960's and is not included as a contributing feature because it post-dates the property's period of significance.

[X] See continuation sheet

DAMS:

The Hudson River is blocked by a combination of hydraulic structures, including an earth embankment, the powerhouse substructure, a concrete non-overflow dam (bulkhead), Bluff Island, and a concrete overflow weir. Together, these raise a 14' head at the Mechanicville hydroelectric site forming a pond that stretches 1 mile upstream (north) to the foot of the dam at Champlain Canal Lock 3.

An earthen embankment stretches from the west bank of the Hudson to the eastern end of the powerhouse. It is 40' wide at the top, 124' wide at its base, and up to 18' tall -- rising 8' above normal headwater level. To prevent seepage, the embankment was built around a thin concrete core wall that stretches from bedrock to a level just below the surface. The top of the embankment serves as principal access road to the site.

The concrete and steel substructure of the powerhouse, with nine turbine chambers and tailrace channels and a 6' thick bulkhead separating the turbines from the generator floor, serves as part of the dam in its own right. It blocks the section of the western channel between the embankment and non-overflow dam.

The eastern end of the powerhouse is connected to Bluff Island by a 26' high concrete dam -- 10' wide at the top, 14' wide at the base, with a vertical upstream face and slopped air face. The base of this structure is pierced by four channels for waste gates, each 4' wide by 6'-9" tall. Originally all four opens were equipped with gates operated by rack and pinion hoists but three have been plugged and their operators removed.

The main dam is a cast concrete gravity weir that runs 800' from Bluff Island to an abutment on the east bank of the Hudson. Rising 18' above the river bed, it is 8' wide at the top, 16' at the base, with a 14' apron extending downstream to prevent scour at the toe. The upstream face is vertical while the downstream side is ogee shaped, curving from the crest to the apron. The eastern end of the dam ties into sloping bedrock on the Rensselaer County side. The western abutment, on Bluff Island, was originally equipped with twelve waste gates, 4' wide by 6' high, operated by rack and pinion hoists similar to those on the non-overflow section. All of those passageways were plugged by New York State and the operators removed some time after 1923. The concrete of this western abutment and the waste gates is now (1989) severely deteriorated. A portion of the eastern end of the spillway washed away in 1977.

POWERHOUSE:

Mechanicville powerhouse is a brick, gable roofed building, on reinforced cast concrete foundations. The concrete substructure is 257' - 6" by 66' - 6" overall. The brick superstructure is "L" shaped in plan with a 214' x 34' generator floor, running at right angles to the river's flow, attached, at its western end, to a 45' x 87' office, shop, and services wing whose long axis and ridge line are parallel to the river bank.

SUBSTRUCTURE:

A reinforced concrete substructure under the turbine and generator wing serves as a foundation for the building, forms nine watertight turbine bays and associated tailrace channels, and includes a bulkhead to separate turbine bays from the generator floor. The upstream end of the substructure supports inclined steel trash racks, installed to prevent debris from entering the water turbines. Turbine bays are covered by a cast concrete deck pierced by 6' diameter manholes that allow access to the waterwheels. Seven 22' wide, 32'-6" long, 17'-5" tall bays contain horizontal shaft quadraplex (four runners per shaft) turbines, installed to drive the main generators. The remaining two bays are 10' wide (half the width of the others) and are fitted with triplex (three runner) turbines, originally used to drive station exciters.

The substructure is divided in half, longitudinally, by a 6' thick headwall that runs the length of the generator floor and closes off the downstream ends of the turbine bays. The upstream half contains the turbines and is normally flooded with water at a depth of 11'-6." The downstream half is covered by the powerhouse superstructure and contains the station's generators, exciters, governors, and switchgear. Rotating shafts run through the headwall, from the turbine bays to the generators, by way of watertight stuffing boxes mounted in cast-iron plates. The generator floor and a portion of the turbine bays are supported by concrete vaults resting on concrete piers, reinforced by riveted steel box beams and rolled I-beam columns.

River water enters each bay through the trash racks, flows through the turbines, exiting downward through draft tubes into the vaulted space, and continuing downstream under the generator floor into a tailrace below the plant. The tailrace extends 750' downstream to the lower end of Bluff Island, where it rejoins the main channel.

SUPERSTRUCTURE:

The downstream, and most prominent, facade of Mechanicville Hydroelectric Plant is divided into nineteen bays along its 257' length. Built of brick laid in common bond, its walls rise 30'-6" from the concrete foundation and tailrace arches to a corbelled eave line. There are two rows of windows with segmentally arched tops and limestone sills. The lower windows are tall, each with a pair of double-hung sash windows containing four-over-four lights divided by a vertical mullion and capped by a pair of pivoting arch-topped sash containing four lights. Windows in the upper row have pivoting sash with four lights, similar in size and proportion to the upper portion of the units below. The westernmost portion of this facade, three bays of which once formed the south gable end of the office wing, is largely obscured by a flat roofed brick boiler house added in 1901 (now called the "DC room" by plant personnel) and an attached shed (battery room) built sometime thereafter. However, the outline of a circular window, now bricked up, corbeling along the gable eave line, and matching returns of the original building are visible above the later additions.

Because the powerhouse is built into a slope created by the earth embankment, only one story of the east facade is visible above grade. Its six bays are marked by

segmentally arch topped openings with limestone sills. Windows have paired double-hung sash windows containing four-over-four lights, divided by a central mullion. A single door, one bay from the upstream end, provides access to the office.

The upstream gable end of the office wing is 44' wide with two pairs of double-hung windows, similar to those along the west facade. Gable eaves are corbelled out and have returns at their lower ends. A square brick chimney rises from the apex of the gable. The remainder of the upstream (north) facade is largely obscured by a corrugated galvanized iron shed, built ca. 1906 to protect the trash racks, a rack-raking machine, and workers from the weather. Behind that shed, the upstream wall of the generator hall rises 8' from a concrete deck that covers the turbine pits. Sixteen tilting sash containing four-lights each, matching those in the upper row of the downstream facade, are arranged along the 214 foot wall.

Four bays of the office wing are visible above the turbine deck on the east facade. The remaining ones are covered by the intersecting gable end of the generator hall. The east end of that wing is 34' wide, divided into two bays with upper and lower windows that match those along the downstream facade. As with the gable ends of the office wing, this one is marked with corbeling at the eaves and matching returns.

STRUCTURAL SYSTEM:
The generator hall's walls and roof are supported by a structural steel frame of riveted "I" beams, set into the brickwork between each set of windows. Steel carries the downstream crane-rail, 22'-11" above the floor, and continues, with diminished cross-section, an additional 7'-6", to support light section steel roof trusses. The upstream crane rail rests directly on top of the headwall. Wood roof sheathing is carried by timber purlins resting on the trusses. All roof sections are covered by standing seam metal.

INTERIOR:
The generator hall occupies the full length, width, and height of the 214' x 34' wing that runs at right angle to the river's flow. This room contains seven large generators, two small exciter dynamos, turbine governors, and the station switchgear. The latter is mounted on an elevated iron platform near the center of the room. An open stringer stair provides access to the control platform, which is ringed by brass railings (now painted black) and fitted with shepherd's crook light standards.

The upstream third of the office wing is divided into two stories. The ground floor room originally housed coal pockets and a boiler, used for station heat. It is now used as locker room and shop. The upper floor contains two offices and a hallway. Both offices are trimmed in chestnut (now painted) with raised panel wainscotting. Each has a fireplace, with egg-and-dart surrounds of pressed brick, set at a diagonal in the corner against the chimney breast. Pressed sheet metal ceilings on strapping appear to be original. An open steel stringer stair connects the offices with the generator floor.

The downstream two-thirds of the office wing extends full-height to the roof trusses. At various times this space has contained repair equipment, a steam engine,

transformers, and other electrical apparatus. It is now empty, except for two 1950s era frequency converters.

EQUIPMENT

The generators and exciters at Mechanicville Hydroelectric Plant are original to the 1897-99 installation. New turbines and governors were installed in 1902-03 and a number of meters and switches were added to the station controls in the ensuing decades. The visual impact of these changes is not particularly noticeable and the overall aspect of the generator floor is remarkably similar to that shown in opening day photographs.

Turbines:

Mechanicville is equipped with five 51" diameter, 1,000 horsepower turbines. Built by S. Morgan Smith, these horizontal shaft, quadraplex (four runners per shaft) mixed-flow units were installed in 1902 to replace the original 42" Stillwell-Bierce & Smith-Vaile wheels. Each unit consists of two pairs of runners set in "camelback" cases that channel discharge from the wheels, inward and downward, into the draft tubes. Cylinder gates, actuated by governors in the generator hall, control the flow of water through the wheels.

The station's two exciters are individually driven by 18-inch, 300-horsepower, "Victor" brand triplex turbines, built by Stillwell-Bierce & Smith-Vaile.

Governors:

Cylinder type of the seven main turbines are controlled by Lombard type "N" hydraulic governors, installed in 1902 by replace Geisler electro-mechanical controls. Sturgess hydraulic governors (ca. 1905) are attached to the exciter turbines, replacing Snow mechanical governors.

Generators:

Mechanicville is equipped with seven 750 kilowatt, three-phase, General Electric alternating current generators, five installed in 1897-98 and two in 1899. They can each deliver up to 36 amps at 12,000 volts with a frequency of 40 cycles per second. With horizontal shafts, revolving field coils, and fixed armatures 15'-4" in diameter by 3' wide, these alternators are very similar to ones that General Electric built for large steam powerplants at the turn-of-the-century.

Two 100 kilowatt, 125 volt General Electric DC exciters are located the switching gallery. Driven by their own turbines, each is capable of generating current for the field coils of all seven of the main generators.

Switchgear:

The original switchboard was made up of nine 7'-6" x 3' panels of pale blue Vermont marble. Five panels supported generator meters and switches, two controlled feeders from other stations, one was for the exciters, and the easternmost one controlled total station output. Two more panels were installed with the additional generators in 1899. Black slate panels were added and much of the instrumentation was changed in later years.

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties: [ ] nationally [X] statewide [ ] locally

Applicable National Register Criteria [X] A [ ] B [X] C [ ] D

Criteria Considerations [ ] A [ ] B [ ] C [ ] D [ ] E [ ] F [ ] G

Areas of significance	Period of Significance	Significant Dates
Industry	1897, 1902	1897, 1902
Engineering		
Architecture		

Cultural Affiliation

Significant Person

Architect/Builder
A.C. Rice, Engineer/Architect
Stillwell-Bierce and Smith-Vaile, Builder

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

The Mechanicville Hydroelectric Plant is significant under criteria A and C in the areas of industrial development, engineering and architecture as the oldest extant hydroelectric plant in the the state in continuous usage since its construction in 1897. The plant is architecturally significant as an outstanding example of large-scale industrial architecture associated with the burgeoning hydroelectric industry during the late nineteenth and early twentieth centuries. The Mechanicville Hydroelectric Plant derives additional significance in the area of engineering as an intact example of a sophisticated hydroelectric generation facility. Technologically the plant, constructed in 1898 to the design of A. D. Rice, was at the vanguard of the movement to develop mechanisms for the generation and transmission of hydroelectric power in this period. The powerhouse, dam, and generation equipment and machinery are among the earliest remaining examples in the nation and are associated with significant developments in electrical engineering and power transmission during the late nineteenth and early twentieth centuries. The Mechanicville Hydroelectric Plant retains an outstanding level of architectural integrity and remains a rare intact example of its type and period.

On July 16, 1897, R.N. King, president of the turbine manufacturing company Stillwell-Bierce & Smith Vaile of Dayton, Ohio, incorporated the Hudson River Power Transmission Company to build a hydroelectric plant at a previously undeveloped site on the Hudson River near the city of Mechanicville. Inspired by the commercial success of recently completed hydroelectric projects at Niagara Falls, New York and Minneapolis, Minnesota, King proposed a 7,000 horsepower, 5,250 kilowatt plant and transmission system. Power would be sold in Mechanicville, Albany, and Troy, but the principal customer was to be the massive General Electric works at Schenectady, some 17 miles to the west.

Long distance electric power transmission was a new technology in the 1890s, made possible by the use of alternating current (AC). George Westinghouse and his associate William Stanley, America's first proponents of AC systems, began transmission experiments in 1886-87. In 1889 Westinghouse Electric Company built the

[X] See continuation sheet

Willamette Falls hydroelectric plant and a 13 mile single-phase transmission line to Portland, Oregon. Order followed for plants in Ames, Colorado (1891), and Bodi, and Pamona, California (1892). The newly formed General Electric Company of Schnectady, New York, entered the AC business in 1892, forsaking Thomas Edison's adamant preference for DC systems. GE soon won a contract for the equipment of a 500 kilowatt, three-phase hydroelectric plant and 8 mile line at Redlands, California.

In the west, transmission distances, voltage, generating capacity, and levels of corporate competition rose dramatically throughout the early 1890s. These were all overshadowed, however, by a single plant, then under construction at Niagara Falls, New York. Completed in 1895, Adams Station No. 1 was the largest powerplant in the world and would remain so for more than a decade. The subject of intense scrutiny by scientists, manufacturers, entrepreneurs, and the general public, the Niagara powerplant and a 20 mile transmission line to Buffalo, completed in 1896, proved the practical and economic viability of electric power.

R.N. King's project at Mechanicville was a product of the first flurry of enthusiasm that followed successful demonstrations at Niagara. In addition to the Hudson River plant, King's company, Stillwell-Bierce & Smith-Vaile promoted and supplied hydraulic machinery for plants at Chambly, Quebec, and Dolgeville, New York. All three were designed by A.C. Rice, the turbine manufacturer's chief engineer. The Mechanicville, Chambly, and Dolgeville plants were large by contemporary standards and received a great deal of attention in the engineering press. They were not alone, other large projects were being constructed in California, Utah, Montana, and at Sault St. Marie, Michigan.

A.C. Rice had few direct precedents to work from in designing the Mechanicville plant. He had to combine existing civil, construction, and waterpower technologies with recently developed electrical equipment, to create a fundamentally new form of powerplant. Stock pattern, horizontal shaft turbines in open flume settings had been manufactured by Stillwell-Bierce & Smith-Vaile and other companies for nearly half a century. The generators, supplied by General Electric, were similar to those driven by reciprocating engines in steam powerplants. However, connecting the two, at a waterpower site that had high stream flows but low head (fall), such as that at Mechanicville, posed new problems. High speed generators were more efficient and cheaper to build than low rpm ones. Large turbines were needed to generate power at low head sites, but as runner diameter and moment arm increased, rotational speed decreased. Turbine manufacturers overcame these conflicting requirements by installing several small diameter, high speed runners on a single horizontal shaft. Multiple runner turbines had previously been used for pulp mills and other industrial applications that required high shaft speeds, but they came into far greater use with the advent of hydroelectricity.

Stillwell-Bierce & Smith-Vaile supplied the waterpower equipment and served as general contractor at Mechanicville (National Contracting Company of Newark, New Jersey, did most of the actual construction). Electrical equipment and designs for its installation were provided by General Electric. As principal customer, as well as supplier, G.E. paid particular attention to the Hudson River plant. Charles Steinmetz, G.E.'s principal research scientist, designed many elements of the

switchgear, transformers, lightening protection, and transmission system. Although Mechanicville was not G.E.'s first hydroelectric contract, its proximity to the main works at Schenectady encouraged active participation by the electrical manufacturer in design and subsequent experimentation with transmission apparatus.

For a new class of industrial building, A.C. Rice had to adapt and modify existing architectural forms. Structurally, the light steel framing embedded in brick wall resembled that of foundries, erecting shops, and other late nineteenth century industrial buildings that required large volumes of unobstructed space accessible to rail mounted overhead cranes. Architecturally, the plant's arched topped windows, corbelled eave lines, and gable end returns, give an impression of solidity and corporate self confidence, similar to that of other turn-of-the-century industrial structures built in highly visible locations. Mechanicville was not as elaborate as Niagara Falls No. 1, designed by McKim, Mead & White, or the Norman castle that Michigan Lake Superior Power Company was building at Sault St. Marie, but did have more detail and a higher degree of finish than most hydroelectric plants built after 1915.

Rice used the same structural system and similar exterior detailing for hydroelectric plants that he designed at Chambly, Quebec (1898, demolished 1955) and Dolgeville, New York (1898). The machinery arrangement, plant layout, and architectural embellishment at Chambly was virtually identical to the Hudson River Plant. The building at Dolgeville resembles a shortened version of the main wing at Mechanicville but the turbine configuration is very different, necessitated by the 71' head at this site on West Canada Creek. After leaving Stillwell-Bierce & Smith-Vaile, Rice designed the Union Falls (1907) and Franklin Falls (1911) hydroelectric plants on the Saranac River for Paul Smith's Electric Light, Power, and Railroad Company. These plants are strikingly similar to one another but bear little resemblance to his earlier designs.

The Mechanicville plant went into operation in the late summer of 1898 with five of its seven main turbine-generator sets in place. Units 6 & 7 were installed in existing pits at the west end of the powerhouse during December, 1899, bringing the plant to design capacity of 5,250 kilowatts (7,000 horsepower). Initially, all of the station's output was transmitted to the General Electric works at Schenectady over a 17 mile, 12,000 volt line.

In the summer of 1901 a brick boiler house was built at the southwest corner of the powerhouse and fitted with two boilers. These were used to power a 1,000 horsepower Hamilton Corliss tandem-compound steam engine, mounted at the western end of the generator hall, that could be used to turn Unit 7, by means of a rope drive, during emergencies or periods of low water. Pulleys were also added to shaft extensions on unit 5 and one of the exciters so that field current could be generated without using passing water through the exciter turbines.

In the fall of 1902 Eugene Ashley's Hudson River Water Power Company gained corporate control of the Mechanicville Hydroelectric Plant and other properties of the Hudson River Power Transmission Company. Ashley was a Glens Falls, New York attorney who became interested in the financial possibilities of hydroelectric power.

In 1899, he began to acquire land and water rights for a hydroelectric plant at Spier Falls, on the Hudson River, 22 miles upstream of Mechanicville, between Glens Falls and Corinth. Hudson River Power Transmission Company was incorporated in April, 1901 and construction began. An enormous stone dam with an 84 feet head, Spier Falls had a design capacity of 32,000 horsepower (24,000 kilowatts), more than four times that of Mechanicville.

Instead of selling power to a single large customer, Ashley envisioned a distribution network, delivering electricity to a variety of customers in a region that would extend from Glens Falls to Albany and westward, first to Schenectady, then Amsterdam, and eventually (1906) as far as Utica. After securing control of the Mechanicville plant in 1902, Ashley's company built lines to sub-stations at Glens Falls, Fort Edward, Saratoga, Ballston Spa, and Watervliet, as well as reduced voltage distribution lines to industrial and residential customers. Hudson River Water Power Company continued to sell power to General Electric but also begin to sell wholesale electricity to local distribution companies in Albany and Troy as well as to street railways.

Coordinating the output of two big hydroelectric plants and several steam powerplants to meet the demands of industrial, traction, commercial, and residential loads, in more than a dozen communities spread over fifty miles, required creation of new procedures for load dispatching and system control. Physical separation of generating facilities led to centralized load dispatching in many of the larger electric companies that began to coalesce during the first decade of this century. Connected via telephone with generating plants and substations throughout the system, load dispatchers controlled the operation of individual generators, adjusting voltage, frequency, and output, compensating for accidents and scheduled maintenance, and accommodating the varying needs of users throughout the course of days, weeks, and seasons.

T.A. Kenney, assistant to the superintendent at Mechanicville, was made assistant to the operating manager and placed in charge of developing a load dispatching department after Ashley's Hudson River Power Company took over in 1902. Nine years later, after managing an ever growing network in the Hudson and Mohawk Valleys, Kenney moved on to set up a similar but far larger, load dispatching department for Michigan's Consumer's Power Company.

To help meet growing demand, Ashley's company replaced all seven of the main turbines at Mechanicville, shortly after they gained control in 1902. The original 42" Victor turbines had proven too small to drive their generators at full load so they were replaced by 51" wheels, built by S. Morgan Smith Co. of York, Pennsylvania. Turbine settings remained substantially the same--quadraplex units, made up of paired runners discharging through camelback cases, controlled by cylinder gates. Two feet of concrete was removed from the arch at the head of each turbine bay and the draft tubes were enlarged to handle increased flows of water. Lombard Type N hydraulic governors (Lombard Governor Company, Ashland, Massachusetts) were installed with the new turbines, replacing the Geisler electro-mechanical controls. Sometime during the next three years, Sturgess hydraulic governors (Eddy Valve Co., Troy, NY) replaced the Snow mechanical ones on the exciters. New turbines and governors allowed

rotational speeds to be increased so that station frequency could be raised from 38 to 40 cycles without having to rewind the generators. At about the same time a long metal shed was built on the upstream edge of the plant to cover the trashracks, stoplogs, and catwalk.

Ashley continued to expand his system. In 1904, he acquired a 1,550 kilowatt hydroelectric plant at Mill Point on the Schoharie Creek, a steam plant at Cranesville, and Amsterdam's distribution lines. By 1906 he controlled a steam plant in Utica and supplied power to electric streetcar lines throughout the Mohawk Valley.

Eugene Ashley's ambition outstripped his financing, particularly after the Panic of 1907. In 1911, the properties of Hudson River Power Transmission Company, Hudson River Water Power Company, and five other Ashley companies were sold under foreclosure and the seven firms were reorganized as Adirondack Electric Power Corporation. Nine years later, the assets and liabilities of Adirondack Electric Power Corporation were conveyed to Adirondack Power and Light Corporation. On October 26, 1927, Adirondack Power and Light, Adirondack Electric Power, and four other companies were consolidated, to form New York Power and Light Corporation.

The State of New York appropriated most of Bluff Island in 1910 and the site for Champlain (Barge) Canal lock 2. The state also secured the right to draw water impounded by Mechanicville dam for the maintenance of navigation. The power company and its successors retained the right to use "surplus waters" from the pool above the dam, provided that such use did not draw pond elevations below the crest of the dam (El. 48.0 Barge Canal Datum) during the navigation season. On November 26, 1923 the state appropriated the overflow dam from Bluff Island to the east bank and that section of the river bed on which it rests. Since then, the state has been responsible for maintaining Lock 2 and the overflow dam while successive power companies have maintained the western embankment, powerhouse, and non-overflow dam west of the lock. Although now under seperate ownership from the facility, the East Dam remains an integral component of the complex and is intrinsic to the operations of the facility. In addition, the east dam remains an important engineering feature of the facility.

The boilers and engine were removed, sometime before 1930 and the smokestack was demolished. During the '30s, General Electric engineers used the boiler house for experiments with high voltage DC transmission. The turbine of Unit 6 failed in 1932. Two of its four runners mark the entry road to Mechanicville Hydroelectric Plant off N.Y. Highway 32. On January 5, 1950 New York Power and Light was combined with Central New York Power Corporation and Buffalo-Niagara Electric Corporation to form the present Niagara Mohawk Power Corporation. Between 1950 and '52, two General Electric frequency converters were installed where the steam engine once stood. These converted 40 cycle AC, produced by Mechanicville's generators, to 60 cycle, which by then was almost a universal standard in the United States.

9. Major Bibliographical References

[X] See continuation sheet

Previous documwntation on file (NPS):
[ ] preliminary determination of individual listing (36 CFR 67) has been requested
[ ] previously listed in the National Register
[ ] previously determined eligible by the National Register
[ ] designated a National Historic Landmark
[ ] recorded by Historic American Buildings Survey #_____
[ ] recorded by Historic American Engineering Record #_____

Primary location of additional data:
[X] State historic preservation office
[ ] Other State agency
[ ] Federal agency
[ ] Local government
[ ] University
[ ] Other

Specify repository:
_____

10. Geographical Data

Acreage of property 18.25

UTM References

	Zone	Easting	Northing
A			
B			
C			
D			

[X] See continuation sheet

Verbal Boundary Description

The boundary for the nominated property 18.25 acre parcel of land bounded on the west by U.S. Route 4 and on the east by the west bank of the Hudson River. The nominated boundary then bridges the river between its west bank and Bluff Island (Champlain Canal Lock No. 2). The boundary continues on the east side of the island to encompass all structural elements of the eastern dam which terminates on the eastern bank of the river. The discontiguous boundary excludes Bluff Island. The island, once owned by the power company, is now owned by the State of New York and functions as Lock 2 of the Champlain Canal. Although the lock itself may be eligible for listing in the National Register of Historic Places it retains virtually no integrity in relationship to the context established for the hydroelectric facility. Due to this loss of association and physical integrity from the period of significance the island has been excluded from the proposed boundary.

[ ] See continuation sheet

Boundary Justification

The boundary includes the powerhouse, dams (3) and acerage that have historicaly been part of the Mechanicville Hydroelectric Plant and that maintain historic integrity. A portion of the original property known as Bluff Island has been exclude due to its redevelopment as a canal lock. As such, this portion of the original property no longer retains its historic association to the nominated property.

[ ] See continuation sheet

11. Form Prepared By

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organization Office of Parks, Rec. & Hist. Pres. date June 1989
street & number E.S.P. Agency Bldg. #1 telephone 518-474-0479
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BIBLIOGRAPHY
MECHANICVILLE HYDROELECTRIC PLANT

MANUSCRIPTS

Niagara Mohawk Archives, Syracuse, New York.

Benack, John G. "The Niagara Mohawk Story." 1974.

Dales, Gardner H. and J.L. Mowers. "Hydroelectric Generating Stations of Niagara Mohawk and Predecessor Companies." 1974.

Johnson, Neil H. "Cultural resources survey of the Mechanicville hydroelectric plant, Town of Half Moon, Saratoga County, New York." 1979.

"Cultural resources survey of four Hudson River hydroelectric plants, New York." 1980.

"Synopsis of eligibility for the Mechanicville hydroelectric plant, Town of Half Moon, Saratoga County, New York." 1981.

Mowers, John L. "Hudson River Power." 1975.

JOURNAL ARTICLES

NY - Dolgeville
Dolgeville Plant, East Canada Creek
"The Dolgeville, NY, Electric Light and Power Plant."
Electrical Engineering, 03/17/1898, Illus.
Data and illustrations of a plant for the generation of electricity for lighting, heating, etc.

Grissinger, E.A., "The Dolgeville (NY) Water power Electric Light and Power Plant."
American Electrician, 04/01/1898.
Deals with the organization of the technical details relating to the installation.

NY - Mechanicville
Mechanicville Plant, Hudson River
Steinmetz, Charles P., "The Mechanicville-Schenectady (NY) Power Transmission." Electrical World, 11/13/1897, Illus.
Illustrates and describes some of the electrical features, giving reasons why they were adopted.

"The Power Plant of the Hudson River Power Company at Mechanicsville, [sic] New York."
Engineering News, 08/25/1898, 40:130.

"The Mechanicsville [sic] Transmission Plant."
Electrical Review, 08/31/1898, Illus..
Illustrated description of a Hudson River water-power which will supply current to Schenectady and other nearby places.

"The Development of the Hydraulic Power of the Hudson River at Mechanicsville [sic]."
American Electrician, 09/01/1898, Illus..
Fully illustrated article describing the development of 7000 h.p. and its electrical transmission to Schenectady.

"The Hudson River Water Power at Mechanicville."
Engineering Record, 09/03/1898, 38:295.

Hudson River Power Transmission Co.
"The Generation of Electricity by Water Power at Mechanicsville [sic]. Power, 10/01/1898, Illus..
An illustrated detailed description of a Hudson River power plant which will supply Schenectady and other places in the vicinity.

NY - Spier Falls
Spier Falls Plant, Hudson River
Hudson River Water Power Company
"The Dam and Power Station of the Hudson River Water Power Co."
Engineering Record, 03/08/1902, Illus..
Illustrated description of a large masonry dam and power house at Spier Falls, for developing 20,000 H.P.

Parsons, Charles E., "Operations of the Hudson River Water-Power Company."
Transactions of the American Institute of Mining Engineers, 02/01/1903, Illus..
An illustrated description of the plant at Spier Falls, and its construction. Power will be transmitted to surrounding cities and villages.

"The Spier Falls Dam of the Hudson River Water Power Company."
Engineering News, 06/18/1903, Illus..
An illustrated description of the construction of this very large dam, now nearly completed.

Adams, Alton D., "Electric Power from the Hudson."
Electrical World and Engineer, 06/27/1903, Illus..

Illustrates and describes this important development at Spier Falls, which will supply electric light, power and traction in Albany, Troy, Schenectady, and many other places.

Howe, George E., "The Spier Falls Dam and Power Plant of the Hudson River Water Power Company."
Engineering Record, 06/27/1903, Illus..
A full description, with illustrations, of this great engineering work and its construction. Power will be furnished to Albany, Troy and other cities and towns.

Martin, Thomas Commerford, "The Harnessed Hudson."
Review of Reviews, 08/01/1903, Illus..
Reviews of rapid development of water power in the United States, especially considering the recent work at Spier Falls.

"Hudson River Water Power Co."
Street Railway Review, 08/20/1903, Illus..
Brief illustrated description of developments at Spier Falls, Mechanicville and elsewhere on the Upper Hudson.

Main, Walter H., "Spier Falls Dam and Power Plant."
Scientific American, 09/12/1903, Illus..
Illustrations, with brief description.

Parsons, Charles E., "Hydraulics in Connection with Street Railway Operation."
Street Railway Journal, 10/10/1903,.
Read at the Street Railway Conference at Syracuse. Especially discusses the plants at Spier Falls and Mechanicville, and their economy and reliability.

"Transmission of Hudson River Power."
Electrical World and Engineer, 10/24/1903, Illus..
An illustrated description of the Spier Falls power development.

"Hudson River Power in Albany, Troy and Schenectady."
Electrical World and Engineer, 05/04/1904, Illus..
An illustrated detailed account of the interesting power developments around Albany. Relates to the utilization of the power ar various points.

"Hudson River Power in the General Electric Works"
Electrical World and Engineer, 06/11/1904, Illus..
Describes the power transmission from Spier Falls, 30 miles distant.

Adams, Alton D., "Adirondack Power"
Electrical Review, 02/24/1906,.
On the immense undeveloped water power available from the Adirondack Mountains.

"The Hudson River Power Transmission Company."
The Generator, 05/1906, vol 1, no. 2 pp. 3-7.
Continued, with map, Dec. 1906, pp. 4-5.

Parsons, C.E., "Sale of Water-Power from the Power Company's Point of View."
Street Railway Journal, 06/30/1906,.
Read before the NY State Convention. Describes the system of the Hudson River Electric Power Co., and some of the important works in connection with its high-voltage of transmission, and discusses methods of making contracts for railway energy.

"Towers for the Transmission Line between Ballston and Amsterdam, New York."
Electrical Review, 06/30/1906, Illus..
Illustrates and describes the towers being built for a transmission line between Spier Falls and Utica, NY.

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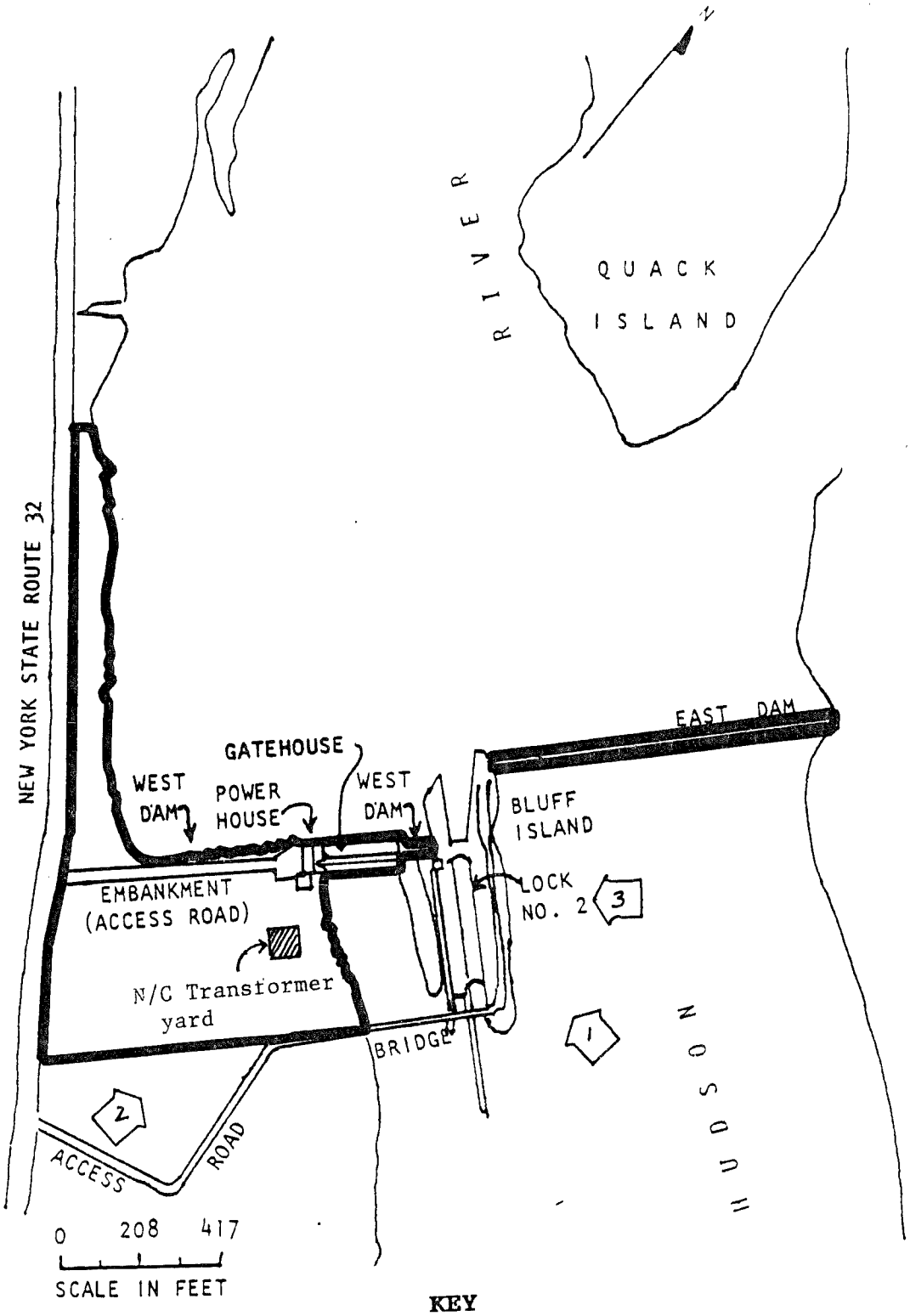
UTM REFERENCES

A. 18/608220/4748190
B. 18/608040/4748000
C. 18/608030/4748020
D. 18/608210/4748200
E. 18/608040/4747880
F. 18/608060/4747740
G. 18/607840/4747600
H. 18/607450/4748190
I. 18/607520/4748220
J. 18/607870/4747880
K. 18/607990/4747920

Mechanicville Hydroelectric Plant
Halfmoon, Saratoga County, NY



KEY

Boundary

Photo Key

Non-contributing Feature