

DE13-033

JOSEPH T. KEENAN, PH.D., PLLC

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NH Certified School Psychologist

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January 28, 2013

JAN 29 '13 PM 4:07

Debra A. Howland, Executive Director
New Hampshire Public Utilities Commission
21 South Fruit St., Suite 10
Concord, NH 03301-2429

Dear Executive Director Howland:

Enclosed please find one original and five copies of my completed **application for certification as a Class IV source**.

I am sending an electronic version of the completed application and this cover letter to you, as well, at executive.director@puc.nh.gov

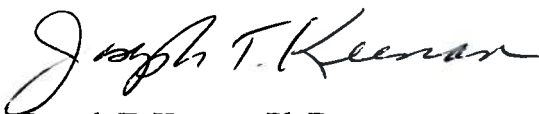
I am the owner and sole operator of a 50kW hydroelectric facility located in Northumberland (Groveton), New Hampshire. I have an interconnection agreement with Public Service of New Hampshire (PSNH), as one of their small producers (SESD #134), under the name Sunnybrook Hydro #2.

I can be contacted via email at jtkphd@gmail.com or via my cell phone at 603 208-8490.

Mail should be sent to me at Joseph T. Keenan, Ph.D., PO Box 270, Lancaster NH 03584-0270.

Thank you.

Sincerely,


Joseph T. Keenan, Ph.D.





State of New Hampshire
Public Utilities Commission

21 S. Fruit Street, Suite 10, Concord, NH 03301-2429



APPLICATION FORM FOR

RENEWABLE ENERGY SOURCE ELIGIBILITY FOR CLASS IV

HYDRO SOURCES WITH A TOTAL NAMEPLATE CAPACITY OF ONE MEGAWATT OR LESS

Pursuant to New Hampshire Administrative Code Puc 2500 Rules, Puc 2505.02 Application Requirements
Laws of 2012, Chapter 0272

- Please submit one (1) original and two (2) paper copies of the completed application and cover letter to:

Debra A. Howland
Executive Director
New Hampshire Public Utilities Commission
21 South Fruit Street, Suite 10
Concord, NH 03301-2429

- Send an electronic version of the completed application and the cover letter electronically to executive_director@puc.nh.gov.

The cover letter must include complete contact information and clearly state that the applicant is seeking certification as a Class IV source. Pursuant to Chapter 362-F:11 I, the Commission is required to render a decision on an application within 45 days upon receiving a completed application.

If you have any questions please contact Barbara Bernstein at (603)271-6011 or Barbara.Bernstein@puc.nh.gov.

Please provide the following:

1. Applicant Name: Joseph T. Keenan
Mailing Address: PO Box 270
Town/City: Lancaster State: NH Zip Code: 03584
Primary Contact: Joseph T. Keenan
Telephone: 603 788-2288 Cell: 603 208-8490
Email address: jtkphd@gmail.com

2. Facility Name: Sunnybrook Hydro #2
(physical address) 79 Herman Savage Rd
Town/City: Northumberland* State: NH Zip Code: 03582

If the facility does not have a physical address, the Latitude _____ & Longitude _____

* generally known as "Groveton"

(To qualify the electrical production for RECs, the facility must be registered with the NEPOOL – GIS).
Contact information for the GIS administrator follows:

James Webb, Registry Administrator, APX Environmental Markets
224 Airport Parkway, Suite 600, San Jose, CA 95110
Office: 408.517.2174, jwebb@apx.com

3. The facility's ISO-New England asset identification number, if available. according to my PSNH monthly statement the Asset ID is 935

4. The facility's GIS facility code, if available. NON 35623

5. A description of the facility including the following:

5.a. The gross nameplate capacity 53 kW

5.b. The facility's initial commercial operation date 1983 refurbished 2011

5.c. The date the facility began operation, if different than the operation date 1983 refurbished 2011

5.d. A complete description of the facility including location, structures and equipment.

See Attachment F (3) entitled "Grandview Farm Hydroelectric Plant" for physical description. For description of mechanical and electrical components, see Attachment B entitled "PSNH Interconnection Report" Section 2.

6. A copy of all necessary state and federal (FERC) regulatory approvals as **Attachment A**.

7. A copy of the title page of the Interconnection Agreement between the applicant and the distribution utility, the page(s) that identifies the nameplate capacity of the facility and the signature pages. *Please provide this information as Attachment B.*

8. Pursuant to 2505.01(c), no generation facility shall be eligible to acquire new certificates under this Chapter while selling its electrical output at long-term rates established before January 1, 2007. Please provide a copy of the facility's long-term rate agreement as **Attachment C**.

9. A description of how the generation facility is connected to the distribution utility.

See Attachment B entitled "PSNH Interconnection Report for Customer Generation"

10. A statement as to whether the facility has been certified under another non-federal jurisdiction's renewable portfolio standard and proof thereof. *Provide documentation as Attachment D.*

This facility has not been certified under another non-federal jurisdiction's renewable portfolio standard.

10. A statement as to whether the facility's output has been verified by ISO-New England.

This facility's output has been verified annually by PSNH. To the best of my knowledge, this is the only ongoing output verification that is conducted.

11. An affidavit by the applicant attesting that the contents of the application are accurate. Use either the Affidavit at the bottom of this page, or provide a separate document as **Attachment E**.

12. The name and telephone number of the facility's operator, if different from the owner.

Facility Operator Name: _____

Phone: _____

13. Other pertinent information that you wish to include to assist in classification of the facility provide as **Attachment F**.
F1: PSNH Small Power Producer Generation statement for Jan 2011
F2: Non-NEPOOL Participant Account Holder Agreement
F3: Grandview Farm Hydroelectric Plant detailed description

CHECK LIST: The following has been included to complete the application:	YES
• All contact information requested in the application.	✓
• A copy of all necessary state and federal (FERC) regulatory approvals as Attachment A .	✓
• A copy of the title page of the Interconnection Agreement between the applicant and the distribution utility, the page(s) that identifies the nameplate capacity of the facility and the signature pages as Attachment B .	✓
• A copy of provide a copy of the facility's long-term rate agreement as Attachment C	✓
• . If applicable, documentation of the hydro facility's certification(s) in other non-federal jurisdiction's renewable portfolio standard program(s) as Attachment D .	
• A signed and notarized attestation or Attachment E.	○
• A GIS number has been provided or has been requested.	✓
• Other pertinent information has been provided (if necessary) as Attachment F .	✓
• This document has been printed and notarized.	○
• The original and two copies are included in the packet mailed to Debra Howland, Executive Director of the PUC. <i>Six copies per Barbara Bernstein tel. conv.</i>	○
• An electronic version of the completed application has been sent to executive.director@puc.nh.gov .	○

AFFIDAVIT

The Undersigned applicant declares under penalty of perjury that contents of this application are accurate.

Applicant's Signature
 Printed Name

Joseph T. Keenan
 Joseph T. Keenan

Date *01/29/2013*

Subscribed and sworn before me this 29 Day of January (month) in the year

County of Merrimack State of New Hampshire

Jonathan S. Osgood
Notary Public/Justice of the Peace

My Commission Expires July 28, 2015

Docket Number: QF07-73-000

FERC Form No. 556
18 C.F.R. § 131.80

**CERTIFICATION OF QUALIFYING FACILITY STATUS FOR AN EXISTING OR A
PROPOSED SMALL POWER PRODUCTION OR COGENERATION FACILITY**

INFORMATION ABOUT COMPLIANCE

Compliance with the information collection requirements established by the FERC Form No. 556 is required to obtain and maintain status as a qualifying facility. *See* 18 C.F.R. § 131.80 and Part 292. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

SUBMITTING COMMENTS ON PUBLIC REPORTING BURDEN

The estimated burden for completing FERC Form No. 556, including gathering and reporting information, is 4 hours for self-certifications and 38 hours for applications for Commission certification. Send comments regarding this burden estimate or any aspect of this collection of information, including suggestions for reducing this burden, to the following: Michael Miller, Office of the Executive Director (ED-34), Federal Energy Regulatory Commission, 888 First Street NE., Washington, DC 20426; and Desk Officer for FERC, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503 (oira_submission@omb.eop.gov). Include the Control No. 1902-0075 in any correspondence.

GENERAL INSTRUCTIONS

Complete this form by replacing bold text below with responses to each item, as required.

PART A: GENERAL INFORMATION TO BE SUBMITTED BY ALL APPLICANTS

1a. Full name of applicant: [Note: Applicant is the legal entity submitting this form, not the individual employee making the filing. Generally, the Applicant will be a company, corporation or organization, unless the facility is owned directly by an individual or individuals.]

Joseph T. Keenan Trust

Docket Number assigned to the immediately preceding submittal filed with the Commission in connection with the instant facility, if any:

none

Purpose of instant filing (self-certification or self-recertification [18 C.F.R. § 292.207(a)(1)], or application for Commission certification or recertification [18 C.F.R. §§ 292.207(b) and (d)(2)]):

Self-certification

1b. Full address of applicant:

**Joseph T. Keenan, Trustee
Sunnybrook Hydro No. 2
POB 270
Lancaster NH 03584-0270**

1c. Indicate the owner(s) of the facility (including the percentage of ownership held by any electric utility or electric utility holding company, or by any persons owned by either) and the operator of the facility. Additionally, state whether or not any of the non-electric utility owners or their upstream owners are engaged in the generation or sale of electric power, or have any ownership or operating interest in any electric facilities other than qualifying facilities. In order to facilitate review of the application, the applicant may also provide an ownership chart identifying the upstream ownership of the facility. Such chart should indicate ownership percentages where appropriate.

**Joseph T. Keenan Trust: 100% owner
Joseph T. Keenan, Trustee**

Joseph T. Keenan, operator

1d. Signature of authorized individual evidencing accuracy and authenticity of information provided by applicant: [Note: A signature on a filing shall constitute a certificate that (1) the signer has read the filing and knows its contents; (2) the contents are true as stated, to the best knowledge and belief of the signer; and (3) the signer possesses full power and authority to sign the filing. A person submitting a self-certification electronically via eFiling may use typed characters representing their name to show that the person has signed the document. See 18 C.F.R. § 385.2005.]


Joseph T. Keenan, Trustee

2. Person to whom communications regarding the filed information may be addressed:

Name: **Joseph T. Keenan**

Title: **Trustee**

Telephone number: **603 788-2288**

Mailing address: **POB 270
Lancaster, NH 03584-0270**

3a. Location of facility to be certified:

State: New Hampshire
County: Coös
City or town: Northumberland
Street address (if known): **79 Herman Savage Road
Groveton, NH 03582**

3b. Indicate the electric utilities that are contemplated to transact with the qualifying facility (if known) and describe the services those electric utilities are expected to provide:

Public Service of New Hampshire

Indicate utilities interconnecting with the facility and/or providing wheeling service [18 C.F.R. §§ 292.303(c) and (d)]:

Public Service of New Hampshire

Indicate utilities purchasing the useful electric power output [18 C.F.R. §§ 292.101(b)(2), 292.202(g) and 292.303(a)]:

Public Service of New Hampshire

Indicate utilities providing supplementary power, backup power, maintenance power, and/or interruptible power service [18 C.F.R. §§ 292.101(b)(3), (b)(8), 292.303(b) and 292.305(b)]:

Public Service of New Hampshire

4a. Describe the principal components of the facility including boilers, prime movers and electric generators, and explain their operation. Include transmission lines, transformers and switchyard equipment, if included as part of the facility.

Utility Interconnect System

This system consists of three utility poles, one 75 KVA transformer, wires, high voltage fuse, required hardware and lightning arresters. On the middle pole is a

box with status lights and an emergency switch to shut the plant down remotely if required. The wires to this system are underground #14 UF cable. The primary voltage is 7200 volts above ground and the secondary voltage is 480 volts above ground. Metering at the power house is part of this system and consists of a current transformer and potential transformer located in the power house. These components are in a heavy metal box adjacent to the rear ventilator. Meters on the front of the power house record power sold and power purchased.

Farmhouse Supply System and Main Disconnect

This system which supplies power to the farm includes the main disconnect switch in the power house. This disconnect located in the center of the back wall of the power house connects the power house system to the PSNH grid. There is a single 150 amp fuse.

The Penstock, Related Pipes, Related Wiring

The penstock consists of 3100 feet of 10 inch plastic water main. The first 500 feet above the power plant are 200 pound test, the next 1600 feet are 160 pound test, and the last 1000 feet are 125 pound test. All of this pipe has a two to one safety factor. The operating pressure at the power house is 165 pounds. The pipeline is buried about three to four feet deep and bedded in bank run gravel. Just outside the power house the pipe is reduced to 8 inches with two 4 inch branches, this welded section is cast in concrete below the power house door. The upper 4 inch pipe is controlled by a 4 inch gate valve and supplies the upper nozzle of the small turbine. The lower 4 inch pipe is controlled by a 4 inch gate valve and supplies the lower nozzle of the small turbine. This lower pipe also supplies a 2 inch gate valve that is a drain for the system. The 8 inch pipe just inside the powerhouse has a 1 inch gate valve welded to the top which supplies water to two reducing valves. Left valve supplies a hose bib outside the powerhouse and then continues underground through a ¾ inch plastic pipe to the house where it supplies several hose bibs and continues on to the barn.

Catchment/Water Intake

Water is diverted into the penstock at this catchment. The catchment was issued a permit over 20 years ago by the NH Department of Environmental Services. There is a small concrete berm which creates a small pond, and also diverts water into a concrete structure called the fore bay. The fore bay consists of a 4' x 7' grate and a series of baffles to keep stones and sticks from entering the penstock. Just before the last baffle there is an 8 inch gate valve with extension handle to facilitate cleaning. The penstock starts at the bottom end of this fore bay. There is

a concrete pad below the catchment to prevent water undermining of the structure. The area behind the grate is covered forming a deck with a trap door for access. There is a small wooden box with door that houses the pressure switch that monitors the water level. Also housed in the box is a small 50 watt heater, transformer and receptacle to provide 120 volt power.

The Power House

This 12' x 12' building is the heart of the system. The building rests on a 2 foot deep vault and crushed rock fill. The vault drains into the brook through 40 feet of 16 inch steel pipe. Resting on the vault is a 6 inch reinforced slab that supports the turbines. The 8 foot sidewalls of poured concrete are 5 feet below grade and 3 feet above grade. The roof is metal supported by frame wood construction; wood sections are insulated. The roof gable ends have screened louvers for ventilation. The rear louver also has a 12 inch fan. Entrance is through a screen door and a regular door. A steel platform and industrial metal stairs provide access to the turbine floor. The back wall contains the electrical contactors, switchgear, capacitors, meters, protective relays, etc.

There are two generating units in the center of the floor. Both units are securely anchored to the concrete and have steel skirts that go through the floor into the vault below.

The larger unit consists of an Ossberger Turbine of cross flow design. The runner and inlet guide vane are of Cr-Ni-Mo steel. The turbine is coupled to the generator with a rubber tire type flexible coupling. The generator is a Marathon Electric, single phase, 480 volt, 50 kW, 1200 RPM induction generator. Counter weights give the guide vane a closing tendency. Operation of the inlet is achieved by a hydraulic cylinder. At full opening of the inlet valve output is 42.5 kW.

The smaller unit consists of a "Pelton Wheel" runner. The runner is cast bronze and directly mounted on the shaft of the generator. Two 4 inch valves control the water to two nozzles, 5/8" and 1 1/16". The generator is a 3 phase, 480 volt 1800 RPM induction motor externally connected to operate as a single phase generator. Control is manual with a magnetically operated spoiler. Output varies between 7 kW and 13 kW depending on the nozzles used. Output drops back a bit when it is run in connection with the Ossberger Turbine.

4b. Indicate the maximum gross and maximum net electric power production capacity of the facility at the point(s) of delivery and show the derivation. [Note: Maximum gross output is the maximum amount of power that the facility is able to produce, measured at the terminals of the generator(s). Maximum net output is maximum gross output minus (1) any auxiliary load for devices that

are necessary and integral to the power production process (fans, pumps, etc.), and (2) any losses incurred from the generator(s) to the point of delivery. If any electric power is consumed at the location of the QF (or thermal host) for purposes not related to the power production process, such power should not be subtracted from gross output for purposes of reporting maximum net output here.]

Gross output: **54 kW**

Net output: **52 kW**

Derivation (assumptions about losses, auxiliary load or lack thereof, and calculation of gross and net output):

Transformer losses

4c. Indicate the actual or expected installation and operation dates of the facility, or the actual or expected date of completion of the reported modification to the facility:

1983

4d. Describe the primary energy input (e.g., hydro, coal, oil [18 C.F.R. § 292.202(l)], natural gas [18 C.F.R. § 292.202(k)], solar, geothermal, wind, waste, biomass [18 C.F.R. § 292.202(a)], or other). For a waste energy input that does not fall within one of the categories on the Commission's list of previously approved wastes, demonstrate that such energy input has little or no current commercial value and that it exists in the absence of the qualifying facility industry [18 C.F.R. § 292.202(b)].

hydro

5. Provide the average annual hourly energy input in terms of Btu for the following fossil fuel energy inputs, and provide the related percentage of the total average annual hourly energy input to the facility [18 C.F.R. § 292.202(j)]. For any oil or natural gas fuel, use lower heating value [18 C.F.R. § 292.202(m)]:

Natural gas: **None**

Oil: **None**

Coal (applicable only to a small power production facility): **None**

6. Discuss any particular characteristic of the facility which the cogenerator or small power producer believes might bear on its qualifying status.

None

PART B: DESCRIPTION OF THE SMALL POWER PRODUCTION FACILITY

Items 7 and 8 only need to be answered by applicants seeking certification as a small power production facility. Applicants for certification as a cogeneration facility may delete Items 7 and 8 from their application, or enter "N/A" at both items.

7. Describe how fossil fuel use will not exceed 25 percent of the total annual energy input limit [18 C.F.R §§ 292.202(j) and 292.204(b)]. Also, describe how the use of fossil fuel will be limited to the following purposes to conform to Federal Power Act section 3(17)(B): ignition, start-up, testing, flame stabilization, control use, and minimal amounts of fuel required to alleviate or prevent unanticipated equipment outages and emergencies directly affecting the public.

N/A

8. If the facility reported herein is not an eligible solar, wind, waste or geothermal facility, and if any other non-eligible facility located within one mile of the instant facility is owned by any of the entities (or their affiliates) reported in Part A at item 1c above and uses the same primary energy input, provide the following information about the other facility for the purpose of demonstrating that the total of the power production capacities of these facilities does not exceed 80 MW [18 C.F.R § 292.204(a)]: [See definition of an "eligible facility" below. Note that an "eligible facility" is a specific type of small power production facility that is eligible for special treatment under the Wind, Waste and Geothermal Power Production Incentives Act of 1990, as subsequently amended in 1991, and should not be confused with facilities that are generally eligible for QF status.]

Facility name, if any (as reported to the Commission):

N/A

Commission Docket Number:

N/A

Name of common owner:

N/A

Common primary energy source used as energy input:

N/A

Power production capacity (MW):

N/A

An eligible solar, wind, waste or geothermal facility, as defined in Section 3(17)(E) of the Federal Power Act, is a small power production facility that produces electric energy solely by the use, as a primary energy input, of solar, wind, waste or geothermal resources, for which either an application for Commission certification of qualifying status [18 C.F.R § 292.207(b)] or a notice of self-certification of qualifying status [18 C.F.R § 292.207(a)] was submitted to the Commission not later than December 31, 1994, and for which construction of such facility commences not later than December 31, 1999, or if not, reasonable diligence is exercised toward the completion of such facility, taking into account all factors relevant to construction of the facility.

PART C: DESCRIPTION OF THE COGENERATION FACILITY

Items 9 through 15 only need to be answered by applicants seeking certification as a cogeneration facility. Applicants for certification as a small power production facility may delete Items 9 through 15 from their application, or enter "N/A" at each item.

9. Describe the cogeneration system [18 C.F.R §§ 292.202(c) and 292.203(b)], and state whether the facility is a topping-cycle [18 C.F.R § 292.202(d)] or bottoming-cycle [18 C.F.R § 292.202(e)] cogeneration facility.

N/A

10. To demonstrate the sequentiality of the cogeneration process [18 C.F.R § 292.202(s)] and to support compliance with other requirements such as the operating and efficiency standards (Item 11 below), provide a mass and heat balance (cycle) diagram depicting average annual hourly operating conditions. Also, provide:

Using lower heating value [18 C.F.R § 292.202(m)], all fuel flow inputs in Btu/hr., separately indicating fossil fuel inputs for any supplementary firing in Btu/hr. [18 C.F.R § 292.202(f)]:

N/A

Average net electric output (kW or MW) [18 C.F.R § 292.202(g)]:

N/A

Average net mechanical output in horsepower [18 C.F.R § 292.202(g)]:

N/A

Number of hours of operation used to determine the average annual hourly facility inputs and outputs:

N/A

Working fluid (e.g., steam) flow conditions at input and output of prime mover(s) and at delivery to and return from each useful thermal application, including flow rates (lbs./hr.), temperature (deg. F), pressure (psia), and enthalpy (Btu/lb.):

N/A

11. Compute the operating value [applicable to a topping-cycle facility under 18 C.F.R § 292.205(a)(1)] and the efficiency value [18 C.F.R §§ 292.205(a)(2) and (b)], based on the information provided in and corresponding to item 10, as follows:

Pt = Average annual hourly useful thermal energy output

Pe = Average annual hourly electrical output

Pm = Average annual hourly mechanical output

Pi = Average annual hourly energy input (natural gas or oil)

Ps = Average annual hourly energy input for supplementary firing (natural gas or oil)

Operating standard = 5% or more

Operating value = $Pt / (Pt + Pe + Pm)$

N/A

Efficiency standard applicable to natural gas and oil fuel used in a topping-cycle facility:

= 45% or more when operating value is less than 15%, or 42.5% or more when operating value is equal to or greater than 15%.

Efficiency value = $(Pe + Pm + 0.5Pt) / (Pi + Ps)$

N/A

Efficiency standard applicable to natural gas and oil fuel used for supplementary firing component of a bottoming-cycle facility:

= 45% or more

Efficiency value = $(P_e + P_m) / P_s$

N/A

FOR TOPPING-CYCLE COGENERATION FACILITIES

Items 12 and 13 only need to be answered by applicants seeking certification as a topping-cycle cogeneration facility. Applicants for certification as a small power production facility or bottoming-cycle cogeneration facility may delete Items 12 and 13 from their application, or enter "N/A" at each item.

12. Identify the entity (i.e., thermal host) which will purchase the useful thermal energy output from the facility [18 C.F.R § 292.202(h)]. Indicate whether the entity uses such output for the purpose of space and water heating, space cooling, and/or process use.

N/A

13. In connection with the requirement that the thermal energy output be useful [18 C.F.R § 292.202(h)]:

For process uses by commercial or industrial host(s), describe each process (or group of similar processes using the same quality of steam) and provide the average annual hourly thermal energy made available to the process, less process return. For a complex system, where the primary steam header at the host-side is divided into various sub-uses, each having different pressure and temperature characteristics, describe the processes associated with each sub-use and provide the average annual hourly thermal energy delivered to each sub-use, less process return from such sub-use. Provide a diagram showing the main steam header and the sub-uses with other relevant information such as the average header pressure (psia), the temperature (deg.F), the enthalpy (Btu/lb.), and the flow (lb./hr.), both in and out of each sub-use. For space and water heating, describe the type of heating involved (e.g., office space heating, domestic water heating) and provide the average annual hourly thermal energy delivered and used for such purpose. For space cooling, describe the type of cooling involved (e.g., office space cooling) and provide the average annual hourly thermal energy used by the chiller.

FOR BOTTOMING-CYCLE FACILITIES

Item 14 only needs to be answered by applicants seeking certification as a bottoming-cycle cogeneration facility. Applicants for certification as a small power production facility or topping-cycle cogeneration facility may delete Item 14 from their application, or enter "N/A."

14. Provide a description of the commercial or industrial process or other thermal application to which the energy input to the system is first applied and from which the reject heat is then used for electric power production.

N/A

FOR NEW COGENERATION FACILITIES

Response to Item 15 is only required for certain applicants for qualified cogeneration facility status, as described below. Applicants for small power production facilities or for cogeneration facilities not meeting the criteria outlined below may delete Item 15 from their application, or enter "N/A." In addition, per 18 C.F.R. § 292.205(d)(4) all cogeneration facilities 5 MW and smaller are presumed to comply with the requirements of 18 C.F.R. § 292.205(d)(1) and (d)(2), and therefore need not respond to Item 15. For those applicants required to respond to Item 15, *see* 18 C.F.R. § 292.205(d) and Order No. 671 for more information on making the demonstrations required in Item 15.

15. For any cogeneration facility that had not filed a notice of self-certification or an application for Commission certification under 18 C.F.R. § 292.207 prior to February 2, 2006, also show:

(i) The thermal energy output of the cogeneration facility is used in a productive and beneficial manner [18 C.F.R §§ 292.205(d)(1), (d)(4) and (d)(5)]; and

(ii) The electrical, thermal, chemical and mechanical output of the cogeneration facility is used fundamentally for industrial, commercial, residential or institutional purposes and is not intended fundamentally for sale to an electric utility, taking into account technological, efficiency, economic, and variable thermal energy requirements, as well as state laws applicable to sales of electric energy from a qualifying facility to its host facility [18 C.F.R §§ 292.205(d)(2), (d)(3) and (d)(4)].

N/A

**PSNH INTERCONNECTION REPORT
FOR
CUSTOMER GENERATION**

Sunnybrook Hydro No. 2

FINAL REPORT

SESD SITE NO. 134

P. A. Magoun
Rev. 1

November 17, 1982
January 16, 2007

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I. INTRODUCTION

A study has been performed to determine the impact of this proposed facility on the PSNH system. The study utilized "typical" machine reactances and time constants since actual data was not readily available.

Any anticipated deviation from the arrangement described in Section II, will directly affect the results of this study. If changes are anticipated now or in the future, PSNH should be informed immediately so that the requirements and recommendations contained within the study can be updated where necessary. This procedure will keep the engineering, material, and construction costs, which are the responsibility of the owner of this facility, to a minimum.

II. DESCRIPTION OF FACILITIES AND MAJOR COMPONENTS

A. Description of Facilities

This facility will ultimately consist of two turbines, each connected to a three-phase induction motor operating in the single phase mode. Maximum expected gross generation is approximately 50 KW, and excess will be delivered, single phase, to PSNH 7.2 kV circuit 30W1 fed from Lancaster S/S. All station service power will be taken from the 480 volt generator bus. Sketch PAM101482 shows the major system components in one-line fashion.

B. Mechanical Components

Turbines	– Number 1 - 60 Horsepower
	– Number 2 - 15 Horsepower
Governors	– None

C. Electrical Components (Updated 1/16/07)

Generators	– Number 1 - Marathon Electric, 50 KW, 3-phase .945 PF 1225 RPM, 480 V, Induction Generator - Delta Connected
	– Number 2 - U. S. Elector Motors, 20 HP, 3-phase 1800 RPM, 480 V, Induction Motor - Delta Connected
Generator Contactors	– Number 1 - Westinghouse Size 4 magnetic combination starter
	– Number 2 - Westinghouse Size 2 magnetic combination starter
Generator Step-up Transformer	– 1 Single Phase, 7200 - 240/480 V, 75 kVA Transformer. Secondary winding center tap is not brought into the facility.

III. PSNH REQUIREMENTS - GENERAL

- A. The connection of the facility to the PSNH system must not compromise the safety of PSNH's customers, personnel or the owner's personnel.
- B. An emergency shutdown pushbutton with facility status indicator lights, and a visible disconnecting device shall be made available for unrestricted use by PSNH personnel. The operation of the pushbutton shall cause all of the facility's generation to be removed from service, and shall block all automatic start-up of generation. The status lights shall be located local to the pushbutton. A red light shall indicate that the facility has generation connected to the PSNH system. A green light shall indicate that all generation is disconnected from the PSNH system. The visible disconnecting device shall be located between the PSNH system and the facility's generation.
- C. The generating facility shall not have the capability of energizing a de-energized PSNH circuit.
- D. The short circuit interrupting device(s) must have sufficient interrupting capacity for all faults that might exist. This rating will be supplied by PSNH.
- E. All shunt-tripped short circuit interrupting devices must be equipped with reliable power sources. A D.C. battery with associated charging facilities is considered a reliable source.
- F. Protection of the generating facility equipment for problems that might occur internal or external to the facility, is the responsibility of the owner.
- G. The connection of the facility to the PSNH system must not reduce the quality of service currently existing on the PSNH system. Voltage fluctuations, and excessive voltage and current harmonic content are among the service quality considerations.
- H. Automatic reclosing of the PSNH circuit after a tripping operation will occur. This operation should not be affected by the interconnection.
- I. All synchronizing (if required) will be done by and at the generating facility.

IV. PSNH REQUIREMENTS - SPECIFIC (RE: One Line Diagram PAM101482)

A. System Configuration and Protection

- 1. The facility must be arranged as per Sketch PAM101482.
- 2. The following protective functions must be supplied and connected to automatically trip the generator contactors.

1. Overfrequency (81/H) - Beckwith Pride Relay, M-0290
2. Underfrequency (81/L) - Beckwith Pride Relay, M-0290
3. Overvoltage (59) - Beckwith Pride Relay, M-0290
4. Undervoltage (27) - Beckwith Pride Relay, M-0290
5. Under-/Overvoltage (27/59) - G. E. Co. 12IAV53K1A

Functions 1-4 will be supplied by a Beckwith single phase type M-0290 PRIDE relay which is being purchased directly from the manufacturer by the facility owner. Relay 5 serves as a backup to the PRIDE relay. this relay will be loaned to the facility for a period of one (1) year after which time the owner will return it, in good condition, to PSNH.

Any substitutions for these devices must be utility grade as approved by PSNH. the settings for all devices will be developed by PSNH.

3. The high voltage fuses and surge arresters applied as protection on the facility's generator stepup transformer must be approved by PSNH.

B. Metering

1. The facility must be equipped with the metering system illustrated on Sketch PAM101482. All required components are described under Section V.B., PSNH Price Estimates - Metering.
2. All transformer losses are to be estimated and subtracted from gross generation by meter calibration.
3. Station Service is metered by Meter No. 2 and billed under PSNH standard "G" rate. This meter is to be a 30 minute interval demand with a detent; and is the responsibility of PSNH.
4. Incoming cable should be looped through the CT twice, to reduce the CT ratio to 100/5.
5. The facility owner is obligated to read the meters in the winter months if the facility is inaccessible. Readings are to be verified by PSNH when the meters again become accessible.
6. The facility owner is responsible for physically mounting the equipment and installing conduit where required.

V. PSNH PRICE ESTIMATES

A. System Protection

- | | |
|--|----------------|
| 1. Apply settings and perform trip tests on system protection equipment. | \$400.00 |
| 2. 1 - 12IAV53K1A Relay (G.E. Co.) | On Loan |
| 3. 1 - 12HGA14A70F Relay (G.E. Co.) | <u>On Loan</u> |
| | \$400.00 |

B. Metering

1.	1 - G.E Type JAK-0, 200/5 amp CT	\$ 63.00
2.	1 - G.E. Type JVK-1, 480-120 Volt VT	153.00
3.	1 - G.E. Type IM-70-S Watthour Meter with a sixty minute M60 Register and detent (Form 3S)	185.00
4.	1 - Anchor Cat. No. URS-8043-CBL-HO Socket	50.00
5.	Cable and Misc. Materials	50.00
6.	Labor and Overheads	250.00
7.	1 - G.E. Type IM-30-S Watthour Meter with a 30 minute M30 Register and dent (Form3S) (Available from GC&M meter shop)	N.C.
8.	1 - Anchor Cat. No. URS-8043-CBL-HO Socket	N.C.

Items 7 and 8 are for Meter No. 2.

\$751.00

C. Distribution

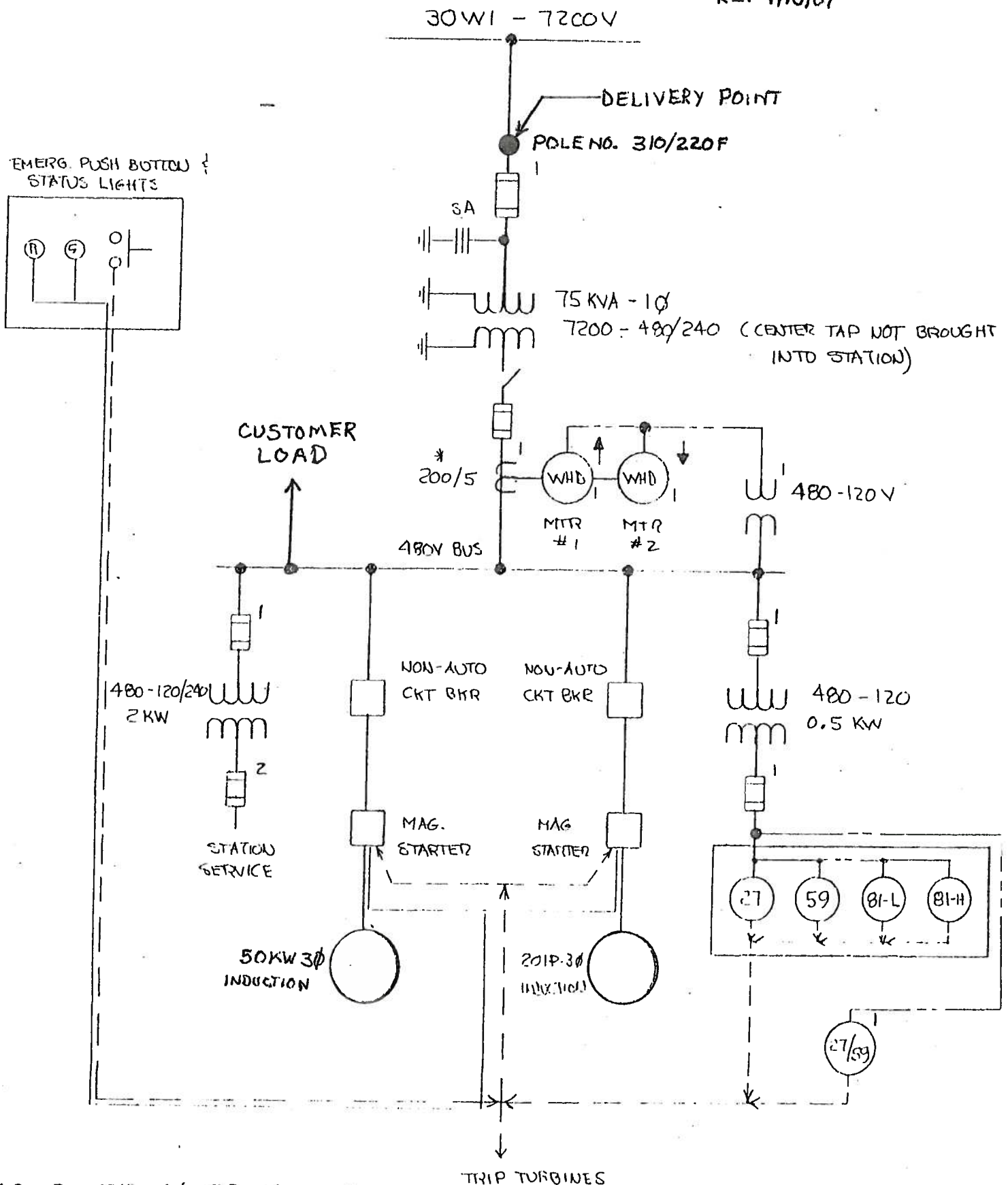
A. Installed cost of materials

1.	3 - 35' Poles	\$885.00
2.	Miscellaneous Hardware for Poles	483.00
3.	800' No. 2 ACSR Wire	168.00
4.	Triplex Service Wire	<u>83.00</u>
		\$1619.00

When the requirements given under Sections III and IV of this study are met, the generating facility is acceptable for interconnection to the PSNH system.².

SK-PAM101482

REV 1/16/07



* CABLE RUN THROUGH CT TWICE. EFFECTIVE RATIO 100/5

Attachment C



**Public Service
of New Hampshire**

PSNH Energy Park
780 North Commercial Street, Manchester, NH 03101

Public Service Company of New Hampshire
P.O. Box 330
Manchester, NH 03105-0330
(603) 669-4000
www.psnh.com

The Northeast Utilities System

January 26, 2007

Joseph T. Keenan
P. O. Box 270
Lancaster, NH 03584-0270

Subject: Sunnybrook Hydro No.2 (SESD #134)
Operating Agreement for Purposes of Wheeling and Power Sales

Dear Mr. Keenan:

Enclosed is your executed original of the subject Agreement and we have recorded you as the new owner of the Sunnybrook Hydro #2. By copy of this letter, we are asking our Law Department to file our original and are notifying the New Hampshire Public Utilities Commission that this Agreement has been executed.

Sincerely,

S. B. Wicker, Jr.
Manager
Supplemental Energy Sources

CNV/dem

Enclosure

cc: D. A. Howland (NHPUC)
G. M. Eaton (w/original)
S. R. Hall

**OPERATING AGREEMENT
FOR
PURPOSES OF WHEELING AND POWER SALES**

AGREEMENT, dated *January 22*, 2007 by and between Joseph T. Keenan Trust, doing business as Sunnybrook Hydro No. 2 (hereinafter referred to as the "Interconnector"), and Public Service Company of New Hampshire, a New Hampshire corporation having its principal place of business in Manchester, New Hampshire (hereinafter referred to as "PSNH").

WHEREAS, Interconnector's Sunnybrook Hydro No. 2 electric generating facility (the "Facility"), (SESD #134) located on the Whipple Brook in Northumberland, New Hampshire, is interconnected with the electric system of PSNH in accordance with applicable New Hampshire Public Utilities Commission ("NHPUC") Orders and federal law; and

WHEREAS, Interconnector intends to certify its generator as a Qualifying Facility ("QF") as defined by the Public Utilities Regulatory Policies Act ("PURPA") as it may be amended from time to time; and

WHEREAS, Interconnector desires to, and PSNH agrees to, provide for the interconnection of the Facility with the electric system of PSNH, its successors and permitted assigns, and Interconnector may have the right to sell the electric output of the Facility to PSNH and/or to such other third party purchasers with which Interconnector may make sales arrangements; and

WHEREAS, to provide for the continued interconnection of the Facility, it is necessary that certain agreements be made to ensure the safety, reliability and integrity of PSNH's electric system and the operation of the Facility; and

WHEREAS, Interconnector and PSNH wish to provide for certain other matters pertaining to discretionary power sales from the Facility;

NOW, THEREFORE, the parties hereby agree as follows:

Article 1. Interconnection and Voltage Characteristics.

The delivery point shall continue to be that point at which the Facility presently interconnects with the 7.2 KV electric system of PSNH. Under this Agreement, the Interconnector shall receive and pay for the services necessary for the purpose of connecting, and providing the continued connection of, the Facility with the PSNH electrical system, including Pool Transmission Facilities ("PTF") as defined by the New England Power Pool ("NEPOOL"), and non-PTF.

Unless PSNH converts its interconnection circuit, all electric energy delivered to PSNH's system from the Facility shall be 7.2 KV, single-phase, sixty hertz.

Article 2. Metering.

The metering shall continue to be configured so as to represent the electric power output delivered to the PSNH electric system as specified in the Interconnection Report ("Report"), dated January 16, 2007 attached as Attachment A. The metering may be installed on the generation side of the transformer provided that transformer losses are subtracted from the measured generation by a suitable method. Interconnector shall be responsible for all costs associated with the metering required for sales to PSNH and/or other third parties from the Facility.

Interconnector has installed and will own, and maintain all metering equipment as referenced in Article 5, to measure the physical flow of electrical energy from the Facility into the PSNH electric system. If at any time the meter is found to be in error by more than two percent fast or slow (+ or - 2%), Interconnector shall cause such meter to be corrected and the meter readings for the period of inaccuracy shall be adjusted to correct such inaccuracy so far as the same can be reasonably ascertained, but no adjustment prior to the beginning of the preceding month shall be made except by agreement of the parties. All tests and calibrations shall be made in accordance with New Hampshire Code of Administrative Rules, Chapter PUC 300 Rules and Regulations for Electric Service, as amended, and any applicable Rules and Regulations of ISO-New England, Inc. ("ISO"). Interconnector is responsible for assuring that meter tests are performed as required at Interconnector's expense. The PSNH Meter Laboratory should be

contacted in advance to arrange for said meter testing.

Interconnector shall cause the meter to be tested at any time upon request of either party and, at PSNH's option, in the presence of a representative of PSNH. If such equipment proves accurate within two percent fast or slow (+ or - 2%), the expense of the test shall be borne by the requesting party.

PSNH reserves the right to secure or seal the metering installation, but upon the written request of Interconnector will provide such information regarding, and access to, the metering installation as Interconnector requests. Interconnector is required to record electrical energy physically delivered to the PSNH electric system on an hour-by-hour basis, and to electronically make available to PSNH, Interconnector's generation in kilowatt-hours for each hour during the prior 24 hours.

To the extent necessary for Interconnector to receive credit and compensation for power sales to entities other than PSNH of electric energy and/or other power products generated at the Facility, PSNH shall cooperate with and assist Interconnector to ensure that the metering installations applicable to the Facility meet the required specifications and operational characteristics as necessary to accomplish such sales.

Article 3. Wheeling Arrangements.

If requested by Interconnector in connection with any sales of energy or other electric products to entities other than PSNH, PSNH (or other Northeast Utilities system companies) shall transmit the electric output of the Facility, or such portion(s) thereof as are identified by Interconnector, to an appropriate PTF point or to such purchasers (as applicable to the transaction) under the terms and conditions and rates set forth in the NORTHEAST UTILITIES SYSTEM COMPANIES Open Access Transmission Service Tariff No. 9 (the "NU OATT") filed with the Federal Energy Regulatory Commission ("FERC"), or its successor tariff, as those tariffs may be amended or supplemented from time to time hereafter. The wheeling of generation shall also be subject to any regulatory approved and applicable local transmission and distribution wheeling tariffs.

Article 4. Power Sales, Billing and Payment.

(a) PURPA Sales

This Agreement is contingent upon the Facility's continuing eligibility for status as a QF as defined by PURPA. As a QF, Interconnector may make sales to PSNH and PSNH shall purchase all or a portion of the electric energy and other electrical products generated at the Facility pursuant to the requirements of the PURPA, the New Hampshire Limited Electrical Energy Producers Act ("LEEPA"), and ISO.

Pursuant to PURPA, and as approved by the NHPUC in Docket No. DE 99-099, in accordance with the Settlement Agreement between PSNH and the State of New Hampshire, the rates paid to Interconnector for short-term, as available power sales to PSNH shall be the applicable market clearing price for such energy and/or other electrical product(s) or such replacement pricing methods as determined by the ISO or any successor entity for each period during which Interconnector has delivered such energy and/or other electrical power products for sale to PSNH. The above short-term prices shall be adjusted for line losses, wheeling costs, and administrative costs as they may be determined by PSNH or the NHPUC and as modified from time to time. The parties agree to abide by the ISO rules for recognition and determination of energy and capacity credit.

Facilities delivering all of their output to the PSNH grid will be assigned a Line Loss Adjustment Factor (the "LLAF"). The initial LLAF for the Facility is 1.0. If a recalculation of the LLAF is required, PSNH shall calculate a new LLAF to represent the change in PSNH's electrical system losses attributable to the generator characteristics and physical location of the Facility. The LLAF shall be applied to that portion of the generation output from the Facility which is sold to PSNH during a billing month by multiplying the LLAF times the kilowatt output. PSNH shall not have the right to use a new or materially different methodology for conducting any such LLAF study except as ordered by the NHPUC. The LLAF may be less than one or greater than one.

Should PSNH no longer be the load holding entity for the entire retail load connected to its System, the LLAF shall be proportionally reduced to reflect the percentage of retail load supplied by PSNH. This adjustment shall become effective with the billing months of February

and August based upon the percentage of retail load supplied by PSNH over the previous six (6) month period ending in December and June, respectively. The LLAFF may be recalculated at the request of either party. The requesting party shall pay for the cost of performing the line loss study. Upon the completion of the updated LLAFF study, the new LLAFF shall be used at the start of the next billing month.

In addition, Interconnector shall have the right and option at any time to engage a third party consultant to validate and verify the methodology and results of any LLAFF study performed by PSNH under this Agreement, at Interconnector's expense. If the review performed by such consultant concludes that the results of any study performed by PSNH are incorrect, then PSNH shall perform a new study, at its expense, to determine the correct LLAFF. Any dispute between the parties related to such studies shall be resolved by the NHPUC.

PSNH shall read the meter, installed in accordance with Article 2, once each month and shall promptly send Interconnector an invoice showing the billing month's net generation and amount owed for energy and other electrical products generated for any sales to PSNH hereunder. Interconnector shall then return to PSNH the approved invoice for payment. PSNH shall make payments to Interconnector electronically for the total amount due within 23 days of the meter reading date, provided that PSNH receives a timely return of the approved invoice.

(b) Bilateral and Power Exchange Sales

At all times during the term of this Agreement, Interconnector shall have the right to sell any or all of the Facility's electric power output, including electric energy, installed capacity, spinning reserves, other operating reserves and/or automatic generation control and other products, to entities other than PSNH, either through bilateral transactions or through the markets administered by the ISO. With respect to any such bilateral or market sales by Interconnector, Interconnector may request that PSNH function as "Lead Participant", and/or "Designated Entity" (as those terms are defined and amended or replaced from time to time by the ISO) and/or other similar role (or function necessary to process and implement such sales) on Interconnector's behalf and, subject to Interconnector's instructions, perform any and all functions in such roles as are necessary to implement and consummate such sales, and shall

submit to ISO and/or other appropriate entities (on Interconnector' s behalf) all information, including, without limitation, standard or non-standard contracts, self-schedules, unit characteristics, bid submissions and metering data, required to effect such transactions, provided that Interconnector provides PSNH with all information and direction reasonably required for the submission of such information by PSNH but no later than 9:30 am on the last business day prior to the commencement of such transaction or bid, unless PSNH can accommodate the transaction in less time.

As PSNH' s full compensation when it acts as the " Lead Participant" for performing the administrative services described in this subsection, Interconnector shall pay to PSNH for each such month an amount equal to the greater of \$500 or 0.0126¢/kwhr of Interconnector' s sales of generation for which PSNH is " Lead Participant" during such month made pursuant to this Article 4 (b). The foregoing shall only be due to PSNH when PSNH actually acts as " Lead Participant" in such sale.

Any contractual arrangements for the sale of electricity with others shall be in accordance with the requirements of the Federal Power Act, the rules of FERC and the rules of ISO New England as they all may be amended from time to time. The price and products associated with such sale shall be identified in the contractual arrangements.

Article 5. Interconnection and Protection Requirements.

Interconnector has installed all interconnection, protection, metering, and control equipment as specified in the Report to ensure the continued safe and reliable operation of the Facility in parallel with the PSNH system. The Interconnector has assumed responsibility for all study costs associated with the development of the Report, and those costs associated with the equipment and its installation, required by the Report. No additional studies are required to be performed, and no additional or different interconnection facilities, system upgrades or protection systems are required to be constructed, installed or implemented, in order to maintain the interconnection of the Facility with the PSNH System.

Up to the delivery point, all equipment shall remain the sole property of Interconnector. Interconnector shall have sole responsibility for the operation, maintenance, replacement, and

repair of the Facility, including the interconnection equipment owned by the Interconnector.

Prior to the interconnection to PSNH' s system under this Agreement, Interconnector tested, and every twelve months thereafter, Interconnector shall continue to test, or cause to be tested, all protection devices including verification of calibration and tripping functions; and Interconnector shall provide PSNH with a copy of the tests and results.

If either party reasonably determines that the operation or use of any portion of the protection system will or may not perform its protective function, Interconnector shall immediately open the interconnection between PSNH' s system and the Facility. Interconnector shall promptly notify PSNH of this action and the reason for this action. The interconnection shall remain open until Interconnector has satisfactorily cured the defect. Any repair or replacement of Interconnector' s equipment shall be at no cost to PSNH, except PSNH shall be responsible for any loss or damage requiring repair or replacement of all or a portion of the Interconnector' s equipment as a result of the negligence or misconduct of PSNH, its agents or employees.

Article 6. Right of Access.

Upon prior written or oral notice to Interconnector, PSNH shall have the right to enter the property of Interconnector at mutually agreed upon reasonable times and shall be provided reasonable access to Interconnector's metering, protection, control, and interconnection equipment to review for compliance with this Agreement. PSNH shall provide Interconnector with a copy of any notes, reports or other documents made relating to any such inspection or review.

Article 7. Modification of Facility.

If Interconnector plans any modifications to its Facility as described in Attachment A, which modifications would reasonably be expected to affect its interconnection with the PSNH System, Interconnector shall give PSNH prior written notice of its intentions.

Article 8. Term of Agreement.

This Agreement shall become effective between the parties on the date of execution of this agreement but no earlier than the date PSNH receives notification from Interconnector that its status as a QF has been filed with FERC. This Agreement shall remain in full force and effect subject to the suspension and termination rights contained in this Article 8. PSNH acknowledges that it has received a certificate of insurance as required by Article 9, and that the interconnection equipment as set forth in Attachment A has been properly installed and tested.

Interconnector may terminate this Agreement by giving PSNH not less than sixty (60) days prior written notice of its intention to terminate. PSNH may terminate the interconnection under this Agreement by giving not less than sixty (60) days prior written notice should Interconnector fail to substantially perform with the interconnection, metering and other safety provisions of this Agreement, and such failure continues for more than sixty (60) days from date of notice without cure. The PSNH notice shall state with specificity the facts constituting the alleged failure to perform by Interconnector. If the parties are unable to reach agreement within 60 days on a cure for the Interconnector's failure to perform, either party may elect to submit the dispute to the NHPUC for resolution.

If changes in applicable federal or state statutes, regulations or orders; or changes in applicable ISO or NEPOOL requirements occur which materially affect this Agreement, the parties shall negotiate in good faith to modify this Agreement to accommodate such changes. If the parties are unable to reach agreement within 60 days, either party may elect to submit the dispute to the NHPUC for resolution.

PSNH may also terminate its obligation contained in this Agreement if all laws, regulations and orders mandating interconnections or purchases from qualifying facilities are repealed, or declared invalid by a Court or Regulatory Agency, and no revised law is enacted providing for such interconnection or sales on a similar basis.

After termination of this Agreement, both parties shall be discharged from all further obligation under the terms of this Agreement, excepting any liability (including without limitation the obligation to pay for power delivered prior to any such termination which obligation shall survive the termination of this Agreement) which may have been incurred before the date of such

termination. Any reasonable costs incurred by PSNH to physically disconnect the Facility as a result of the termination of this Agreement shall be paid by the Interconnector. Termination of this Agreement shall not effect the parties' obligation to pay for power delivered prior to termination of that purchase obligation.

Article 9. Indemnification and Insurance.

Each party will be responsible for its equipment and the operation thereof and will indemnify and save the other harmless from any and all loss by reason of property damage, bodily injury, including death resulting there-from suffered by any person or persons including the parties hereto, employees thereof or members of the public, (and all expenses in connection therewith, including attorney's fees) whether arising in contract, warranty, tort (including negligence), strict liability or otherwise, caused by or sustained on, or alleged to be caused by or sustained on, equipment or property, or the operation or use thereof, owned or controlled by such party, except that each party shall be solely responsible for and shall bear all costs of its negligence, and willful misconduct, and claims by its own employees or contractors growing out of any workers' compensation law. The foregoing paragraph shall survive the termination of this Agreement and such termination will not extinguish any liabilities or obligations in respect of reimbursements under this paragraph, incurred up to the time of termination.

The Interconnector shall, at its own expense, continue to maintain throughout the term of this Agreement Comprehensive General Liability Insurance with a combined single limit of not less than \$1,000,000 for each occurrence.

The insurance policy specified above has named and shall continue to name PSNH, Northeast Utilities and its subsidiaries, officers, directors and employees, as additional insured with respect to any and all third party bodily injury and/or property damage claims arising from Interconnector's performance of this Agreement. It is further agreed that PSNH shall not by reason of its inclusion as an additional insured incur liability to the insurance carrier for the payment of premium for such insurance. The policy shall not be canceled, terminated, altered, reduced or materially changed without at least thirty (30) days prior written notice to PSNH.

Evidence of the required insurance has been provided to PSNH in the form of a Certificate of Insurance prior to the actual physical interconnection of the Facility, and annually thereafter. During the term of this Agreement, the Interconnector, upon PSNH's reasonable request, shall furnish PSNH with certified copies of the actual insurance policies described in this Article.

The insurance coverage is and shall continue to be primary and is not in excess to or contributing with any insurance or self-insurance maintained by PSNH or its affiliates and shall not be deemed to limit Interconnector's liability under this Agreement.

PSNH shall have the right to modify the limits of liability specified herein, at any time in the future, to remain consistent with those limits generally required by the NHPUC. PSNH must notify Interconnector in writing, at least ninety (90) days prior to any required change and these new liability limits will become effective upon renewal of the Insurance Policy.

In no event shall either party be liable, whether in contract, tort (including negligence), strict liability, warranty, or otherwise, for any special, indirect, incidental, punitive or consequential losses or damages, suffered by the other party or any person or entity and arising out of or related to this Agreement including but not limited to, cost of capital, cost of replacement power, loss of profits or revenues or the loss of the use thereof. This paragraph of Article 9 shall apply notwithstanding any other statement to the contrary, if any, in this Agreement and shall survive the termination of this Agreement.

Article 10. Force Majeure.

Neither party shall be considered to be in default hereunder and shall be excused from performance hereunder if and to the extent that it shall be prevented from doing so by storm, flood, lightning, earthquake, explosion, equipment failure, civil disturbance, labor dispute, act of God or the public enemy, action of a court or public authority, withdrawal of equipment from operation for necessary maintenance and repair, or any other cause beyond the reasonable control of either party and not due to the fault or negligence of the party claiming force majeure, provided that the party claiming excuse from performance uses its best efforts to remedy its inability to perform.

Article 11. Dispute Resolution and Voluntary Arbitration.

In the event of any dispute, disagreement, or claim (except for disputes referred to the NHPUC under Article 8 of this Agreement) arising out of or concerning this Agreement, the Party that believes there is such a dispute, disagreement, or claim will give written notice to the other Party of such dispute, disagreement, or claim. The affected Parties shall negotiate in good faith to resolve such dispute, disagreement, or claim. If such negotiations have not resulted in resolution of such dispute to the satisfaction of the affected Parties within ten (10) working days after notice of the dispute has been given, then, an affected Party may, upon mutual agreement of all of the affected Parties, submit such dispute, disagreement, or claim arising out of or concerning this Agreement, including whether such dispute, disagreement, or claim is arbitrable, to binding arbitration.

The arbitration proceeding shall be conducted by a single arbitrator, appointed by mutual agreement of the affected Parties, in Manchester, New Hampshire, under the Commercial Arbitration Rules of the American Arbitration Association in effect at the time a demand for arbitration under such rules was made. In the event that the affected Parties fail to agree upon a single arbitrator, each shall select one arbitrator, and the arbitrators so selected shall, within twenty (20) days of being selected, mutually select a single arbitrator to govern the arbitration. A decision and award of the arbitrator made under the Rules and within the scope of his or her jurisdiction shall be exclusive, final, and binding on all Parties, their successors, and assigns. The costs and expenses of the arbitration shall be allocated equitably amongst the affected Parties, as determined by the arbitrator(s). Judgment upon the award rendered by the arbitrator(s) may be entered in any court having jurisdiction. Each Party hereby consents and submits to the jurisdiction of the federal and state courts in the State of New Hampshire for the purpose of confirming any such award and entering judgment thereon.

Article 12. Modification of Agreement.

In order for any modification to this Agreement to be binding upon the parties, said modification must be in writing and signed by both parties.

Article 13. Prior Agreements Superseded.

Once effective, this Agreement with Attachment A represents the entire agreement between the parties with respect to the interconnection of the Facility with the PSNH electric system and, as between Interconnector and PSNH, all previous agreements including previous Contracts, discussion, communications and correspondence related thereto are superseded by the execution of this Agreement.

Article 14. Waiver of Terms or Conditions.

The failure of either party to enforce or insist upon compliance with any of the terms or conditions of this Agreement shall not constitute a general waiver or relinquishment of any such terms or conditions, but the same shall remain at all times in full force and effect. Any waiver is only effective if given to the other party in writing.

Article 15. Binding Effect; Assignment

This Agreement shall be binding upon, and shall inure to the benefit of, the respective successors and permitted assigns of the parties hereto. PSNH shall not assign this Agreement or any of its rights or obligations hereunder without the prior written consent of Interconnector except to a successor-in-interest. PSNH shall provide written notice to Interconnector of any such assignment to a successor-in-interest within fifteen (15) days following the effective date of the assignment. Interconnector shall have the right to assign this Agreement to any person or entity that is a successor-in-interest to the Facility without the consent of PSNH. In the event of any such assignment, Interconnector shall notify PSNH in writing within fifteen (15) days following the effective date of the assignment. Interconnector may make such other assignment of this Agreement as it determines, subject to the prior written consent of PSNH, which consent shall not be unreasonably withheld or delayed. Any assignment in violation of this Article shall be void at the option of the non-assigning party.

Article 16. Applicable Law.

This Agreement is made under the laws of the State of New Hampshire and, to the extent applicable, the Federal Power Act, and the interpretation and performance hereof shall be in accordance with and controlled by such laws, excluding any conflicts of law provisions of the State of New Hampshire that could require application of the laws of any other jurisdiction.

Article 17. Qualifying Facility Status

Interconnector has stated its intent to seek FERC certification of its generator as a QF and this Agreement and the related Interconnection Report shall be null and void should Interconnector fail to file for or should FERC deny the certification of QF status for the generator or later revoke the Project' s QF status.

Article 18. Headings.

Captions and headings in the Agreement are for ease of reference and shall not be used to and do not affect the meaning of this Agreement.

Article 19. Notices and Service.

All notices, including communications and statements which are required or permitted under the terms of this Agreement, shall be in writing, except as otherwise provided or as reasonable under the circumstances. Service of a notice may be accomplished and will be deemed to have been received by the recipient party on the day of delivery if delivered by personal service, on the day of confirmed receipt if delivered by telegram, registered or certified commercial overnight courier, or registered or certified mail or on the day of transmission if sent by telecopy with evidence of receipt obtained, and in each case addressed as follows:

Interconnector: Sunnybrook Hydro No. 2
P. O. Box 270
Lancaster, NH 03584-0270
Attn.: Joseph T. Keenan, Trustee
Telephone No. (603) 788-2288
email: ~~jtkenan@neia.net~~ jtkphd@gmail.com

PSNH:

Public Service Company of New Hampshire
780 North Commercial Street
P. O. Box 330
Manchester, NH 03105-0330
Attn.: Manager, Supplemental Energy Sources Department
Telephone No. (603) 634-2312
Fax No. (603) 634-2449
email: psnhsesd@psnh.com

IN WITNESS WHEREOF, the parties, each by its duly authorized representative, have hereunto caused their names to be subscribed, as of the day and year first above written.

Joseph T. Keenan Trust

By:

Title:

Joseph T. Keenan
Trustee

Duly Authorized

Public Service Company of New Hampshire

By:

Title:

John M. MacDonald

John M. MacDonald

Vice President - Energy Delivery & Generation

Duly Authorized

SMALL POWER PRODUCER GENERATION

**Public Service
of New Hampshire**

Public Service of New Hampshire
Supplemental Energy Sources Department
PO Box 330
Manchester, NH 03105-0330

Joseph T Keenan Trust
P.O. Box 270
Lancaster, NH 03584

Sunnybrook Hydro #2

SESD # 134
Asset ID 935
Billing Period: January 2013
Invoice Date 01/23/2013
Expected Payment Date 02/08/2013
PO# 02247752
Node 4381
Tel # 603-788-2288
Email jtkphd@gmail.com

Delivery Period: December 17 through January 16

Total Generation Delivered (MWhrs) **10.837**

Short Term Energy Payment \$ 470.89

Total Short Term Energy Payment **\$ 470.89**

The weighted average hourly price for this invoice equals 43.45 \$/MWhr

Capacity Supply Obligation (Kw)	FCM Auction Payment	Peak Energy Rent Adjustment	
17	\$50.17	\$0.00	\$50.17

Adjustments \$0.00

Energy & Capacity Payment **\$521.06**

ISO-NE Schedule 2 Expense Recovery

MWhrs Delivered	ISO-NE Schedule 2 Recovery Fee	
10.837	0.1852 \$/MWhr	(\$2.01)

Total Payment Due **\$519.05**

Notes

The Energy Payment is based upon the attached hourly NH Node ISO-NE Clearing Prices.
Included in this invoice is the FCM Value for your project in November as credited by ISO-NE

Approved by: Joseph T. Keenan

Date: 01/25/2013

Please Sign to Approve and Return this Invoice
by one of the accepted methods to:

Katherine Roberge
PSNH, PO Box 330
Manchester, NH 03105-0330
psnhsesdinvoices@nu.com

Payment terms: payment within 23 days from the read date provided return receipt is received in a timely manner. The only approved methods are PDF, electronic signature via email or approved original by US mail. FAX is not accepted.

Please contact Diane Cecchetti at PSNH (603-634-2888) or email diane.cecchetti@nu.com with questions.

Non-NEPOOL Participant Account Holder Agreement

By this Agreement dated November 2, 2012, Joseph T. Keenan ("Non-NEPOOL Participant"), [a _____ [corporation] with its principal office in _____] [a person whose principal place of residence is Northumberland NH] agrees to comply with all of the terms and conditions of the Generation Information System Development and Administration Agreement dated as of October 26, 2001, by and between the entities that are Participants from time to time in the New England Power Pool, a voluntary association, pursuant to the Restated New England Power Pool Agreement dated as of September 1, 1971, as amended and restated from time to time (the "NEPOOL Participants") and Automated Power Exchange, Inc. (the "GIS Agreement"), and the New England Power Pool Generation Information System Operating Rules (the "GIS Operating Rules"), each as amended, modified or restated from time to time, to the same extent as if the Non-NEPOOL Participant were a NEPOOL Participant; and, if and when the Non-NEPOOL Participant becomes liable to NEPOOL or ISO New England Inc. for financial obligations related to NEPOOL's generation information system (the "GIS"), with the ISO New England Financial Assurance Policy and the ISO New England Billing Policy attached to the ISO Transmission, Markets and Services Tariff, as modified to include financial obligations related to the GIS of entities that are not NEPOOL Participants (the "Policies"). Without limiting the generality of the foregoing, the Non-NEPOOL Participant shall pay any and all fees established for it from time to time by the NEPOOL Participants Committee or its delegatee; provided, however, that the GIS Project Manager shall provide notice to the Non-NEPOOL Participant at least seven (7) days prior to the effectiveness of any change in NEPOOL's GIS cost allocation methodology or any fee assessment that would result in the Non-NEPOOL Participant becoming liable for increased financial obligations related to the GIS, and the Non-NEPOOL Participant may withdraw from the GIS prior to the effectiveness of such change without incurring such increased obligations. Any Certificates created for the Non-NEPOOL Participant prior to the date of its withdrawal from the GIS shall remain in existence until the end of the applicable Trading Period, but the Non-NEPOOL Participant shall not participate in transfers of Certificate after the date of its withdrawal. The Non-NEPOOL Participant shall provide Automated Power Exchange, Inc. and/or ISO New England Inc. (or their successors) with any and all information required in order for either of them to bill the Non-NEPOOL Participant for any fees established as described above.

The Non-NEPOOL Participant acknowledges that it has received full and fair consideration for this agreement. Moreover, the Non-NEPOOL Participant agrees that the NEPOOL Participants, acting by and through the NEPOOL Participants Committee, may terminate its involvement in the New England Power Pool Generation Information System if at any time it fails to comply with the GIS Agreement, the GIS Operating Rules or the Policies.

IN WITNESS WHEREOF, the undersigned have caused this agreement to be executed as of the date above.

Non-NEPOOL Participant

[Joseph T. Keenan]

By: Joseph T. Keenan
Name: Joseph T. Keenan
Title: owner/operator

ACKNOWLEDGED:

New England Power Pool Participants

By: Alyd Sugrue
NEPOOL GIS Project Manager

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Grandview Farm Hydroelectric Plant

General Description:

The major components of the generating plant can best be broken down into five separate systems. Each system deserves its own narrative. Three of the systems are very simple and require little or no maintenance. Two of the systems require more extensive maintenance. The energy that drives the system is derived from pressure developed in the penstock, (water main). The water comes from a one square mile drainage area located above the farm on the White Mountain National Forest and from additional land that is part of the farm. The average flow is in the vicinity of 1 cubic foot per second (450) gallons per minute. The drainage area is very high with a top elevation of about 3500 feet above sea level and the catchment or intake is about 1700 feet above sea level. The penstock of 3100 feet of ten inch pipe develops a pressure of 165 pounds per square inch (psi).

Utility Interconnect System:

This system consists of three utility poles, one 75 KVA transformer, wires, high voltage fuse, required hardware and lighting arresters. On the middle pole is a box with status lights and an emergency switch to shut the plant down remotely if required. The wires to this system are underground #14 UF cable. The primary voltage is 7200 volts above ground and the secondary voltage is 480 volts above ground. Metering at the power house is part of this system and consists of a current transformer and potential transformer located in the power house. These components are in a heavy metal box adjacent to the rear ventilator. Meters on the front of the power house record power sold, left meter, and power purchased, right meter. The power sold meter is accessed by Public Service Co. of New Hampshire (PSNH) every hour by a phone connection. This phone connection is a ring mate number, 788-9885 and is part of our regular phone service to the farm. Maintenance of the status lights, emergency switch, and phone connection are the owner's responsibility. Maintenance of all power wiring and meters are the responsibility of PSNH at the owner's expense. There has been no maintenance required during the past 20 years by PSNH. Owner maintenance is required to change the status light bulbs if they burn out. The on, red light, is fluorescent and last about five years. The off, green light, is so seldom on that it has never had to be replaced.

Farmhouse Supply System and Main Disconnect;

This system which supplies power to the farm includes the main disconnect switch in the power house. This disconnect located in the center of the back wall of the power house connects the power house system to the PSNH grid. There is a single 150 amp fuse. There is a spare fuse in the center slot in the enclosure. The top terminal is the sole connection to PSNH. Bottom terminal has several connections. 2 red #8 wires go to

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the house panel on right wall above work bench. 2 blue #12 wires go to power house and instrument transformers. Black 2/0 goes to generators. 3 black #12 go to surge arrester. Underground to the house are three conductors that supply the house transformers, One 4 wire phone cable, three, number 12 conductors that supply the indicator lights in the house. All wires in the main disconnect box are 480 volt. The conductors that supply the indicator lights are 120 volt. This system has required no maintenance since its installation.

The Penstock, Related Pipes Related Wiring:

The pipeline (penstock) consists of 3100 feet of 10 inch plastic water main. The first 500 feet above the power plant are 200 pound test, the next 1600 feet are 160 pound test, and the last 1000 feet are 125 pound test. All of this pipe has a two to one safety factor. The operating pressure at the power house is 165 pounds and during shutdown goes up to about 175 pounds due to hydraulic hammering. There is a mechanical joint of 12.5 degrees 150 feet below the catchment and a mechanical joint coupling just outside the power house. The pipeline is buried about three to four feet deep and bedded in bank run gravel. Just outside the powerhouse the pipe is reduced to 8 inches with two 4 inch branches, this welded section is cast in the concrete below the power house door. The upper 4 inch pipe is controlled by a 4 inch gate valve and supplies the upper nozzle of the small turbine. The lower 4 inch pipe is controlled by a 4 inch gate valve and supplies the lower nozzle of the small turbine. This lower pipe also supplies a 2 inch gate valve that is a drain for the system. The 8 inch pipe just inside the powerhouse has a 1 inch gate valve welded to the top which supplies water to two reducing valves. Left valve supplies a hose bib outside the powerhouse and then continues underground through a 3/4 inch plastic pipe to the house where it supplies several hose bibs and continues on to the barn. There is a cross connection in the house basement with the spring water system if it is ever required. Right valve supplies water through a filter to the hydraulic control system. There are three pressure gauges, the penstock pressure +/- 165 pounds, the house pressure +/- 100 pounds, and the hydraulic pressure +/- 80 pounds.

Buried with the pipe are a 4 conductor phone cable and a 4 conductor #14 power cable. At four points the wires are brought above ground in case they ever need testing, these points are covered with capped 10 inch pipe and painted grey. The penstock, related wire, valves, etc have required no maintenance except for the occasional cleaning of the filters and the draining of the hose bib outside the power house.

Catchment / Water Intake:

Water is diverted into the penstock at this catchment. The catchment was issued a permit 20+ years ago by the NH Department of Environmental Services. There is a small concrete berm which creates a small pond. Slots in the berm hold three 3" X 12" planks that maintain the water depth and can be removed for cleaning. This berm also diverts water into a concrete structure called the fore bay. The fore bay consists of a 4' X 7' grate which prevents large sticks from entering the penstock. There are also a series of baffles

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that trap any solid material, such as small stones, from entering the penstock. Just before the last baffle there is an 8 inch gate valve with extension handle to facilitate cleaning. The penstock starts at the bottom end of this fore bay. There is a concrete pad below the catchment to prevent water undermining of the structure. The area behind the grate is covered forming a deck with a trap door for access. There is a small wooden box with door that houses the pressure switch that monitors the water level. Also housed in the box is a small, 50 watt, heater, transformer and receptacle to provide 120 volt power. Collected debris, sand, stones, and other trash that comes down the brook must be cleaned out once a year. This takes about four hours and is done by hand. The screen must be cleaned with a rake as conditions warrant. For a month or so in the fall this can be a daily event and takes a few minutes once you are at the catchment. The catchment can be accessed by tractor or 4 wheel drive truck when the ground is firm. Several times a year, when the temperature takes a sharp drop well below freezing, a condition known as "Anchor Ice" develops. This condition is caused by the velocity and temperature of the water flowing through the grate. It is best to anticipate the condition and back down the power plant to less than 10 KW output. Some extreme conditions such as flooding with lots of debris in the brook, extremes of slush and snow, etc are best handled by just shutting down the plant for a few hours or overnight. Anchor ice will generally clear the next day when the temperature of the air rises above the minimum of the night by a few degrees. Winter operation is usually the most trouble free of the year as the brook is frozen over and there is little or no debris.

The Power House:

This 12' x 12' Building is the heart of the system. The building rests on a 2 foot deep vault and crushed rock fill. The vault drains into the brook through 40 feet of 16 inch steel pipe. Resting on the vault is a 6 inch reinforced slab that supports the turbines. The 8 foot sidewalls of poured concrete are 5 feet below grade and 3 feet above grade. The roof is metal supported by frame construction. Wood sections are insulated. The roof gable ends have screened louvers for ventilation. The rear louver also has a 12 inch fan. Entrance is through a screen door and regular door. A steel platform and industrial metal stairs provides access to the turbine floor. The back wall contains the electrical contactors, switchgear, capacitors, meters, protective relays, etc. There are two generating units in the center of the floor. Both units are securely anchored to the concrete and have steel skirts that go through the floor into the vault below.

The larger unit consists of an Ossberger Turbine of cross flow design. The runner and inlet guide vane are of Cr-Ni-Mo Steel. The turbine is coupled to the generator with a rubber tire type of flexible coupling. The Generator is a Marathon Electric, single phase, 480 volt, 50KW, 1200 RPM induction generator. Counter weights give the guide vane a closing tendency. Operation of the inlet is achieved by a hydraulic cylinder. At full opening of the inlet valve output is 42.5KW. The turbine was inspected and cleaned in 2003. The runner showed no wear except for a bit of roughness the size of a fingernail on the back side probably due to cavitation at low output. The bearings, bearing seals,

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and gaskets were replaced during the inspection. The Marathon Generator was inspected, cleaned, inside recoated, painted and bearings replaced in 2005.

The smaller unit consists of a "Pelton Wheel" runner. The runner is cast bronze and directly mounted on the shaft of the generator. Two 4 inch valves control the water to two nozzles, 5/8" and 11/16". The generator is a 3 phase, 480 volt 1800 rpm induction motor externally connected to operate as a single phase generator. Control is manual with magnetically operated spoiler. Output varies between 7 KW and 13 KW depending on the nozzles used. Output drops back a bit when it is run in conjunction with the Ossberger Turbine. The bronze runner was replaced with a new bronze runner of more efficient design in 2004. The bronze runner removed showed almost no wear. The generator was inspected, cleaned, insulation recoated, painted, and bearings replaced in 2005.

Maintenance of the two generating units consists of topping off the bearings monthly with a shot of grease, 2 shots for the Ossberger Turbine. Yearly the grease is cleaned out of the outboard housing of the bearings on the Ossberger Turbine. The filter supplying the water pressure to the valves and cylinder is cleaned when required.

The electrical system located on the back from left to right is as follows.

1. Transformer and circuit breakers for power house lights, receptacles, exhaust blower, fan and heater.
2. Enclosed 50 amp breaker and magnetic starter for the small generator. The manual start button for this generator is on the door of the enclosure
3. Enclosed 150 amp breaker and magnetic starter for the large generator. Within the enclosure are the current transformer for the panel meters and two 480 volt fuses for the power house station power, control power, and power to the catchment.
4. Main disconnect switch and main 150 amp fuse. This disconnect turns off all power. There is a spare 150 amp fuse in the cabinet.
5. Mechanical start/stop buttons for small and large generators. Above these buttons are three red status lights. Center light indicates that power from the control circuit is on. Upper light indicates that power to the large generator contactor is on. Lower light indicates that power to the start button of the small generator is on.
6. Instrument enclosure and monitoring meters. Inside left cabinet are two plug in time relays. Yellow relay is additional delay time beyond the 4 minutes delay of the Pride Relay. This is set for about 5 minutes most of the year. During the summer, when outage caused by lightning may occur, the delay is increased to 20 minutes to allow thunderstorms to clear the area before restart. When the Pride relay and time delay relay, delay times, are satisfied power is supplied to the black relay which energizes for a few seconds and locks on the control relay. In turn the control relay energizes several circuits.
 - a. 480 volt power is supplied to #5 above.
 - b. 120 volt power is shut off to the strobe light on the power house roof.

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- c. 120 volt power is supplied to the regulating valve system cabinet on the right wall. 120 volt power is supplied to the status lights located in the house.

Pride Relay on the cabinet right monitors PSNH power quality for four minutes. Right light adjacent, indicates power is supplied to the relay. Left light adjacent indicates line quality is OK and delay time requirement has been satisfied. 5 indicator lights on the Pride relay indicate power, voltage, frequency etc. If the relay does not perform properly the fuse supplying the relay should be removed for five minutes (located under instrument transformer). Spare fuses and control relay for the Pride are located in the Pride enclosure. The Pride relay is checked yearly as required by PSNH. Except for the fuses and control relay service must be done by the manufacture. Other than fuse changes, usually caused by lightning, there has been no problems with the relay. To the left of the Pride relay are indicating meters for total system kilowatts and current in amperes. Below the meters is a digital tachometer that is not being used. Under the tachometer and between the two lights is a reset switch to override the automatic reset, see 6 above. If both lights are on this button can be pushed. This will lock in the control relay. The toggle switch for the tachometer is not used.

Enclosure above the workbench contains a disconnect and fuses for the house.

Enclosure to right of bench is the water level control. Left switch controls power in. Right switch has three positions. Up is automatic, middle power to valves off, and lower is manual. In the power off position or if PSNH power is interrupted water pressure will close the cylinder to the restart position. This is mechanically set at about 1200 rpm. In the manual position the cylinder can be adjusted between the mechanical set points. In the automatic position the cylinder goes to the low set point when the water level at the catchment drops 4 inches, both valves are off. At the low set point one valve turns on which holds the cylinder. When the water level at the catchment rises 4 inches both valves are on and the cylinder opens to the high set point. The high and low set points are adjusted to maintain a narrow operating range. Lights on the top of the enclosure indicate power on, high water, low water. These lights are duplicated on the house monitor. Lights on the front of the Ossberger turbine indicate power to the valves.

The power plant, during more than two decades of operation, has supplied over three million KWH of power into the grid system of PSNH and (Estimated) a million KWH of power to the farm to supply lights, hot water, and a good deal of the heat. The rate paid by PSNH has varied from 2 cents per KWH to over ten cents per KWH. The

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price is set by regulators and is primarily based on avoided cost. Basically avoided cost is what the utilities avoid by not generating the power themselves. This is, for the most part, the cost of fuel. The escalating cost of natural gas as well as increases in other fuels has contributed to a sharp increase in the income for the plant. In 2004 the plant income was just under ten thousand dollars. This year, 2005, the income will be over thirteen thousand dollars. Add to this money saved in purchased power. I estimate it at about five thousand dollars a year. The plant has been completely upgraded to a like new condition in the past few years. This plant with routine maintenance and proper operating procedures should be good for another 20 to 30 years.