

STATE OF NEW HAMPSHIRE

Inter-Department Communication

DATE: March 7, 2008

AT (OFFICE): NHPUC

FROM: TF Tom Frantz – Director, Electric Division

SUBJECT: DE 06-061, Energy Policy Act of 2005
Staff Recommendation of Interconnection

TO: Chairman Getz, Commissioners Morrison and Below
Executive Director Howland



As part of the Commission's consideration of the five new standards under the Energy Policy Act of 2005, (EPAAct), Staff conducted discovery and held a technical session concerning Section 1254, the standard for interconnecting electric customers with on-site generation to the local distribution company. As staff stated in its Reply Comments in the instant proceeding, the technical nature of interconnection and the varying opinions of the parties on the correct standard to use are best addressed by technical conferences and collaboration.

Staff convened a technical meeting with the parties on August 14, 2007 to discuss whether changes to the existing utility interconnection standards should be made and specifically, whether interconnection standards such as the NARUC Model Interconnection Procedures, the Institute of Electrical and Electronics Engineers (IEEE) Standard for Interconnecting Distributed Resources with Electric Power Systems (IEEE 1547) or the Massachusetts Interconnection Standards should be adopted for New Hampshire.

Staff employed the Liberty Consulting Group (Liberty) to assist Staff in its Section 1254 review. Attached to this memo is the report and recommendations of Liberty concerning interconnection. Based on Staff's review of the responses of the parties in this proceeding and the recommendation of Liberty, Staff recommends that the Commission direct the parties to convene in the near future to work toward a standardized set of interconnection procedures for projects of 10 kVA or smaller based on the Massachusetts Interconnection Standards. In the meantime, Staff believes it is appropriate to use the existing interconnection standards. Staff also supports the recommendations of Liberty that adoption of new interconnection standards should not be applied retroactively except in cases where an existing facility changes its output capability to require upgrades to its interconnection facilities or operates in an unsafe condition in regard to its interconnection. More detailed recommendations, supported by Staff, are contained in Liberty's report.

Please contact me if you have any questions or would like to discuss this matter.

DOCKET No. DE 06-061

ENERGY POLICY ACT OF 2005

INTERCONNECTION STANDARDS (NOT INCLUDING NET METERING)

THE LIBERTY CONSULTING GROUP'S

SYNOPSIS OF RESPONSES TO STAFF INFORMATION REQUESTS

AND RECOMMENDATIONS

MARCH 5, 2008

On August 4, 2006, the New Hampshire Public Utilities Commission (Commission) issued an Order of Notice pursuant to passage of The Energy Policy Act of 2005 (EPAAct) that requires state commissions to consider five new federal standards added to Title I of the Public Utilities Regulatory Policies Act (PURPA). The fifth standard, under Section 1254 of EPAAct, is concerned with interconnection. The Liberty Consulting Group was asked by the Commission Staff to provide technical expertise on interconnection standards. The following is Liberty's overview of the position of the parties on interconnection and Liberty's conclusions and recommendations. A more detailed overview of the positions of the parties appears at the end of the report in Appendix A.

Summary of Liberty's Recommendations

Current interconnection policies should remain as the status quo at this time. Utilities should file quarterly reports of scheduled versus actual interconnect time lines for each project.

New Hampshire should prepare for what may become a large number of interconnection applications by adopting an interconnection standard using the Massachusetts Interconnection Standards as a starting point. The parties should identify conflicts or problems of using the Massachusetts Interconnection Standards with New Hampshire law or administrative Rules and propose changes to the Massachusetts Interconnection Standards or New Hampshire requirements that address those conflicts or problems. Changes to the Massachusetts Interconnection Standards beyond those requirements must be justified to the Commission.

New interconnection standards should not be generally applied on a retroactive basis.

Standardization of interconnections should be for small projects of 10 KVA or less or for some other small nominal amount.

Overview of Liberty's Review

On August 14, 2007, an Interconnection Standards technical conference was held to discuss adoption of interconnection standards such as the NARUC Model Interconnection Procedures and Agreement for Small Distributed Generation Resources, Institute of Electrical and Electronics Engineers (IEEE) Standard for Interconnecting Distributed Resources with Electric Power Systems (IEEE 1547), and the Massachusetts Interconnection Standards. At that technical conference, it became clear to Staff that much effort had already been expended in Massachusetts on this specific topic and that the Massachusetts Interconnection Standards were based on IEEE 1547. In addition, affiliates of Granite State Electric, Public Service Company of New Hampshire (PSNH), and Unitil Corporation in Massachusetts had participated in the Massachusetts collaborative process that resulted in the adoption of the Massachusetts Interconnection standards.

Staff believed its efforts would be most productive and efficient if the use of the Massachusetts Interconnection Standards in New Hampshire were explored. Staff requested written comments regarding 1) Identification of aspects of the Massachusetts Interconnection Standards that may need to be modified for application in New Hampshire; 2) Whether existing generators should be subject to any new interconnection standards and why?; and 3) How many interconnections are under study in New Hampshire? Five entities responded¹. In alphabetical order, the respondents were Granite State Electric, Granite State Hydropower, PSNH, Unitil Corporation, and collectively the Wood Power Plants (Bridgewater Power Company, Hemphill Power & Light Company, Pinetree Power Inc., and Pinetree-Tamworth Inc.). A short synopsis of the questions and salient responses of each participant appears below followed by Liberty's conclusions and recommendations. Appendix A to the report contains a full and detailed synopsis of the participant's comments.

Participant Comments

1) Identification of aspects of the Massachusetts Interconnection Standards that may need to be modified for application in New Hampshire.

Granite State Electric

- Costs and fees need to be revisited. ISO-NE frequency requirements need to be added.

Granite State Hydropower

- No comments.

Public Service Company of New Hampshire

- Extensive and detailed comments on virtually every aspect of the standard. Most of the comments are process orientated but cost, third party agreement, different protection requirements, and insurance issues are raised.

¹ The New Hampshire Electric Cooperative did not participate.

Unitil

- UL certification clarification and incompatibility to NHPUC 900 Rules for net metering.

Wood Power Plants

- Apply only to small applications. Does not address interconnection of Qualifying Facilities.

2) Should existing generators be subject to any new interconnection standards and why?

Granite State Electric

- No, unless existing project is upgraded/replaced.

Granite State Hydropower

- No, as long as existing facility is safe and reliable.

Public Service Company of New Hampshire

- No response.

Unitil

- No, but believes that generator is responsible for upgrades when the utility or other generators make changes to their systems.

Wood Power Plants

- No, unless existing generator is deemed to be unsafe.

3) How many interconnections are under study in New Hampshire?

Granite State Electric

- One.

Granite State Hydropower

- No response.

Public Service Company of New Hampshire

- Twelve.

Unitil

- Less than ten per year.

Wood Power Plants

- No response

4) Other Comments

Granite State Electric

- None.

Granite State Hydropower

- Costs must be reviewed by evidence on the record. Granite State Hydropower wants clarification on whether the instant docket relates to technical interconnection standards only or if it includes rates and terms for power sales from Small Power Producers without Rate Orders.

Public Service Company of New Hampshire

- None.

Unitil

- None.

Wood Power Plants

- Adoption of standards to larger size installations will require substantial resources and time.

Liberty's Conclusions

- 1) The responses to Staff's information requests can be summarized as follows: PSNH seems to desire the status quo, Unitil and National Grid believe that reasonable implementation of the Massachusetts Interconnection Standards is possible, and Granite State Hydropower and the Wood Power Plants seem to be indifferent providing retroactive application of any new standard is not implemented.
- 2) The Massachusetts Interconnection Standards were approved by the then named Massachusetts Department of Telecommunications and Energy which should be an *a priori* showing that they are technically sound, represent good utility practice, and result in a safe interconnection. The three New Hampshire utilities are affiliates of utilities in Massachusetts who accepted and use the Massachusetts Interconnection Standards. Much of the concerns expressed about the Massachusetts Interconnection Standards may be just "second bites at the apple." Liberty believes that The Massachusetts Interconnection Standards can form the basis for common interconnection requirements in New Hampshire with appropriate, but limited, modification to either the Massachusetts Interconnection Standards or New Hampshire requirements.
- 3) Standardized interconnection standards were developed from standards that were intended for small projects in the order of 10 KVA or less.
- 4) The number of projects interconnecting on an annual basis appears small at this time (approximately 20). The number of projects will depend on technology development,

Liberty's Recommendations

- 1) Because the number of projects coming on line is relatively small on an annual basis, Liberty recommends that New Hampshire leave the status quo interconnection policies in place at this time. Each utility should file a quarterly report with the Commission showing a scheduled time line for each project initiated and the actual time line for that project.
 - 2) In preparation for what may become a large number of interconnection applications, the Commission should commence an informal proceeding with the three utilities as mandated parties to begin the process of standardizing New Hampshire interconnection policy using the Massachusetts Interconnection Standards as the starting point for a NH document. Commission instructions should be clear that the only changes permitted are those that conflict with New Hampshire law or Administrative Rules and all changes should contain a recommendation as to what changes should be made to either the Massachusetts Interconnection Standards or New Hampshire requirements and why.
 - 3) If new interconnection standards are eventually adopted, they should not generally be applied on a retroactive basis to existing facilities. If an existing facility changes its output capability requiring its interconnection to be upgraded, upgrades its interconnection, or creates an unsafe condition with its interconnection, then that facility should upgrade its interconnection to the new standards. In cases not specifically covered by the above, the generation facility should be treated as any similar sized customer with regard to responsibilities for upgrades.
 - 4) Standardization for New Hampshire's interconnections should not include Qualified Facilities covered by PURPA as they are addressed separately.
 - 5) Standardization for New Hampshire's interconnections should be for projects of 10 KVA or less or some other small nominal value for which the various interconnection standards were originally designed.
- Some parties indicated that, they believe efforts to standardize interconnection policies in New Hampshire for other than small distributed generation will be a lengthy one.
- All of them are moving in a direction that public policy, and the price of energy. All of them are moving in a direction that indicates that the number of projects seeking interconnection will increase in the future.

DOCKET No. DE 06-061

ENERGY POLICY ACT OF 2005

INTERCONNECTION STANDARDS (NOT INCLUDING NET METERING)

THE LIBERTY CONSULTING GROUP'S

SYNOPSIS OF RESPONSES TO STAFF INFORMATION REQUESTS

AND RECOMMENDATIONS

MARCH 5, 2008

APPENDIX A

Participant Comments

1) Identification of aspects of the Massachusetts Interconnection Standards that may need to be modified for application in New Hampshire.

Granite State Electric

Section 5.1: Cost or Fee Adjustment Procedures, Exhibit D: Impact Study Agreement, Section 7, and Exhibit E: Detailed Study Agreement, Section 7 all have provisions that require the utility to advise the interconnecting customer of cost increases and require the utility to absorb cost increases more than 10 percent above the utility's original estimate. Granite State Electric would remove this 10 percent cap as it believes that the utility is unfairly penalized for costs which it has no control over such as ledge, environmental contamination, significant changes in equipment and material costs, unknown permitting costs, and abandoned infrastructure.

Section 4.1.3: Frequency

Granite State Electric recommended adding an additional section that includes the Northeast Power Coordinating Council Document A-03 Emergency Operation Criteria which requires generation to ride through a defined system under frequency event or automatically shed customer-side load served. Additionally, Granite State Electric states that this requirement is a mandatory ISO-NE requirement.

Granite State Hydropower

No response.

Public Service Company of New Hampshire

PSNH states that it proposes no solutions in its comments as that should be an iterative process, that its comments are not a complete list of concerns, and that the narrative accompanying an identified concern should not be considered complete, nor have they pointed out every area where changes need to be made to conform the Massachusetts standards to their current practices and requirements and, vice versa. PSNH uses the Massachusetts Electric MDTE Tariff No. 1116-A for reference in its comments.

In Section 1.2: Definitions, there should be a new definition of Distributed Generation to mean all new and existing generation under the jurisdiction of the NHPUC. In addition, other definitions need to be modified to apply to New Hampshire's standards.

In Section 2.0: Basic Understanding, the interconnection agreement should only be between the utility and the customer, not third parties. In addition, topics that are not covered include the procedures for purchasing output, study process for line loss adjustment factors, wheeling/loss/administration fees, and billing and payment procedures.

In Section 3.0; Process Overview, up to 3 different data sets of generation can be submitted for one study. PSNH does not believe this is practical, timely, or cost effective. It is not normally the utilities responsibility to optimize the method of interconnection.

In Section 3.0: Process Overview, the simplified process requires revision of the generation sizes, the allowance of net metering for non-renewable projects, and the payment to a net metered customer for excess generation.

In Section 3.0: Process Overview, the expedited process and screens must allow for site specific settings of protective relays because of looped circuits, line maintenance conditions and other unique circuit characteristics. The expedited process review should be limited to induction generators under 1 MW in size, otherwise details need to be reviewed and modified. The expedited process does not result in an interconnection report being issued or require as built drawings.

In Section 3.0: Process Overview, the listed criteria for other than simplified (inverter-based) interconnections would require significant review before being found as an acceptable path to an expedited interconnection.

In Section 3.0: Process Overview, the 15, 30, 45, and 125 business day time frames specified do not account for existing utility work, establishment of a time record for each submittal to meet the detailed rules, the complexity of process mapping and required bookkeeping and will require additional resources and time to implement. PSNH suggests looser guidelines. The time frames for notice/witness test descriptions for the simplified and expedited interconnections are not clear. PSNH states that a test within 10 days of a requested date is reasonable.

In Section 3.0: Process Overview, the fee schedule in Section 3.5 and Table 2 should be reviewed to determine if the utility adequately covers the utilities expenses and whether

language should be added to allow the utility to recover actual out-of-pocket costs that exceed the fixed fee schedule.

In Section 3.0: Process Overview, the flow chart of the screening process should be modified to determine if the project is under FERC or NH jurisdiction. PSNH comments that the customer does not have the required information to determine if the project qualifies for expedited treatment and that the utility must make that determination.

In Section 3.0: Process Overview PSNH points out differences in service applications, that the protection package will have to be reviewed if non-utility grade equipment is used with non-inverter based 1741 applications, that the 20 KVA shared secondary limit may be too high, and that the 10 MW limit that could meet the expedited process needs to be reviewed.

In Section 3.0: Process Overview, PSNH states that existing generation upgrade requirements, a process to phase in non-critical upgrades, and a process for using equivalent but different equipment than what is listed in the tariff are topics not covered.

In Section 4.0: Interconnection Requirements, PSNH states that quoting IEEE Standard 1547 in Section 4.2.3 of the tariff is undesirable as further revisions to the tariff will be required should the IEEE standard change. Further some details in IEEE Standard 1547 may be inappropriate in certain distributed generation applications.

In Section 4.0: Interconnection Requirements, requires that importing or exporting reactive power from the project will be reflected in the customer bill because projects with customer load are billed in accordance with standard tariffs (Section 4.1.5).

In Section 4.0: Interconnection Requirements, Section 4.2 (Protection Requirements), requirements differ from and do not include all of those of PSNH. A technical review will be required.

In Section 4.0: Interconnection Requirements, PSNH states that the utility may require, depending on size, notice prior to starting or stopping the generator, scheduling generation output levels in accordance with ISO-NE market rules, advance maintenance annual schedules to conform with ISO-NE rules, and reporting of relay targets for system events that cause the generator to trip.

In Section 8.0: Metering, PSNH states that issues exist in Section 8.1 that are applicable to them regarding equipment ownership, cost of providing service, ongoing equipment charges, size of facility, and Commission requirements for Independent Power producers. They further state that sales to the utility/ISO-NE will require metering with a recorder and link to a dedicated telephone line so the generation can be queried and reported to the ISO-NE daily.

PSNH also raises differences in how confidentiality is treated, general liability insurance levels, insurer requirements and endorsements, evidence of insurance, and self insurance.

Additionally, PSNH points out that Exhibit B requires data up front that is normally not available thereby potentially delaying a project, that the ISO-NE may require an application and review for a project sized 2 MW or greater, that the impact study agreement in Exhibits D and E is more formal than is currently used, concerns if substantial modification of study estimates are not +/- 25 percent, concerns if the project is the cause for study estimates to increase by more than 10 percent which the utility must pay, duplicity of the wording in Exhibit F, that Section 5.1 of Exhibit F requires the utility to pay utility construction costs in excess of 10 percent higher than the estimate, that Attachments 1-4 of Exhibit F can be folded into the New Hampshire interconnection report, and that Attachment 5 of Exhibit F would allow agreements with third parties. Finally, PSNH points out that Section 2.0, Section 9.3, Section 11.2, etc. cite and are governed by Massachusetts law and that they would need to be revised to reflect New Hampshire law.

Unitil Corporation

Unitil has been applying the Massachusetts technical screening process in New Hampshire for about a year and believes there is no pressing need for substantial changes to the review process. Unitil states that if significant changes are made to the interconnection requirements, such as to increase the exposure or impact of generation on the electric system, it would reconsider its position. Additionally, Unitil states that it understands that process issues such as fee schedules, response time frames, etc. will be discussed at a later time.

Specifically, Unitil states that screens are used to approve a generator's interconnection application and that one of those screens verifies that the facility seeking interconnection has been tested to comply with IEEE Standard 1547, but is unclear as to what those certification requirements are. Unitil recommends that those requirements need to be clarified, the facility must be listed by UL1741 and/or UL2200 as tested, and compliant to the appropriate testing standard.

Unitil states that the screen for voltage drop caused by motor starting is more liberal than its New Hampshire practice and recommends a 2 percent primary voltage drop and a 3 percent secondary voltage drop if the secondary is shared with other customers.

Unitil states that NHPUC 900 Rules establish net metering for installations up to 100 kW and that this figure would have to be revised to be consistent. Additionally, Unitil has identified a few terms that are state specific, are not used, or are inaccurate that need to be addressed.

Wood Power Plants

The Wood Power Plants state that their comments do not address the form applications, impact study agreements, interconnection agreements, cost and charges, or insurance levels.

The Wood Power Plants support streamlined interconnection procedures but believe the Massachusetts Interconnection Standards were negotiated and approved to accommodate smaller distributed generation as they rely on IEEE 1547 and suffer the same shortcomings as they outline in 4) below.

The Massachusetts Interconnection Standards were not designed to address the interconnection of Qualifying Facilities as Massachusetts has separate rules that apply to Qualifying Facilities.

Before adopting the Massachusetts Interconnection Standards for application to all types and sizes of generation, the Commission should study the differences between FERC Order 2003, FERC Order 2006, ISO-NE Schedule 22, and ISO-NE Schedule 23.

2) Should existing generators be subject to any new interconnection standards and why?

Granite State Electric

Granite State Electric does not believe existing generators need to be subject to new interconnection standards provided the existing generators can prove that annual relay testing has been performed. If upgrades/replacement is being made to the generating facilities and/or the protective devices, then new interconnection standards should apply.

Granite State Hydropower

Granite State Hydropower states that a uniform interconnection standard modeled after the Massachusetts Interconnection Standards should not be applied retroactively to currently connected small power producers absent a showing that a small power producer's existing interconnection devices and/or procedures (based on the original Interconnection Study and Interconnection Agreement) are no longer adequate for safety or reliability reasons, or that the interconnection devices are not working as designed or the interconnection procedures are not being followed. Granite State Hydropower offers support for its recommendation because the Massachusetts Interconnection Standards themselves are prospective according to Sections 1.0 and 2.0 of the Granite State Electric Interconnection Tariff, the Massachusetts Interconnection Standards exempt Qualifying Facilities (virtually all Granite State Hydropower members) because Section 1.1 of Granite State Electric's Interconnection tariff adopts regulations contained in Massachusetts administrative rule 222 CMR 8.04 that sets specific and much simpler standards for interconnection, metering, and payment of Qualifying Facilities in Massachusetts, that application of the Massachusetts Interconnection Standards would be redundant creating significant duplication and waste of time, money and regulatory resources, and that the Massachusetts Interconnection Standards impose unnecessary, unwarranted, and excessive detailed information requirements and open ended costs.

Public Service Company of New Hampshire

No response.

Unitil Corporation

It is the existing generator customer's ongoing responsibility to upgrade their system as necessary for changes made by the utility or the addition of other interconnected generators. As such, Unitil recommends that once a set of interconnection requirements has been met, and the interconnected generator remains up to date with its connection obligations, the generator should not be subject to the requirements of new interconnection standards.

Wood Power Plants

Facilities with existing interconnections should not be required to replace functioning equipment simply because better or different equipment becomes available, or because other users of the system place new or different demands on the system. Facilities that cause an inherently unsafe interconnection or desire to increase its name plate capacity should be required to replace functioning equipment. In addition, should an existing interconnection require change and absent an inherently safe interconnection, 12 months should be afforded to comply with those required changes.

3) How many interconnections are under study in New Hampshire?

Granite State Electric

One small residential photovoltaic interconnection.

Granite State Hydropower

No response.

Public Service Company of New Hampshire

12 interconnection studies.

Unitil Corporation

The majority of Unitil's activity is for small residential net metering installations. Unitil interconnects less than 10 generators per year. It has one application in process and several outstanding inquiries.

Wood Power Plants

No Response.

4) Other Comments

Granite State Electric

None.

Granite State Hydropower

Granite State Hydropower makes reference to ongoing charges such as the unspecified operations and maintenance carrying charge stated on Sheet 23, Note 5 of Granite State Electric's Interconnection Tariff and ongoing administrative costs discussed at the

August 14, 2007 technical conference. Granite State Hydropower believes that the basis and reasonableness of these and similar costs need to be established by evidence on the record and must be subject to discovery and cross examination.

Granite State Hydropower states that if line loss costs or savings are to be determined on a site specific basis with regards to each interconnecting facility as suggested by one party, that a more generic approach such as that incorporated in Massachusetts Qualifying Facility Regulations at 220 CMR 8.05 (6), which requires that each utility file its loss factors in accordance with NEPOOL Market Rules, may also be acceptable. In either case, Granite State Hydropower states that any mechanism for factoring in line losses should be the subject of record testimony and further detailed discussion.

Granite State Hydropower requests clarification if the scope of the instant docket is focused on technical interconnection standards and procedures or whether it includes issues relating to rates and terms for power sales from small power producers whose long term rate orders or contracts are expiring.

Public Service Company of New Hampshire

None.

Unitil Corporation

None.

Wood Power Plants

The Woods do not object to the adoption of IEEE Standard 1547 as a technical standard providing it is applied solely to small scale distributed generation because that standard was designed for application to distributed generation facilities of 10 KVA or less and not to the interconnection of generators of larger size. The development of a uniform safety and reliability standard for the interconnection of larger facilities will require devotion of substantial and scarce utility and independent generator engineering resources requiring at least 12 months for completion.