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PUBLIC UTILITY COMMISSION

2006 APR 27 5:23:35

Comments of the Pennsylvania
Small Generator Coalition c/o

Proposed Rulemaking Re Interconnection
Standards for Customer-generators
pursuant to Section 5 of the Alternative
Energy Portfolio Standards Act, 73 P.S. §
1648.5.

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Docket L-00050175

Implementation of the Alternative Energy
Portfolio Standards Act of 2004:
Interconnection Standards

Docket M-00051865

Introduction

The Pennsylvania Small Generator Coalition (PASGC or SGC)¹ appreciates the opportunity to provide these comments on the Alternative Energy Portfolio Standard regarding the Commission's proposed rulemaking order on Interconnection Standards.

For the purposes of this response the term "Small Generator(s)" should be read as meaning solar photovoltaic, as well as small residential and small commercial (2 MW or less) customer generators as defined in the legislation (SB 1030, page 6).

We thank the Commission for the opportunity to comment on this proposed rulemaking. SGC understands that there is much work to be done to put the rules in place for timely implementation of Act #213, but we reiterate our concerns regarding the use of the MADRI process.

At the time MADRI, it was not clear that the Commission would rely as heavily as it did on MADRI to develop these rules. The solar industry was one of the few non-utility participants so its positions were often considered "minority positions" and not given full consideration. After several attempts to provide input and/or edits to the MADRI document, we were compelled to take the unusual step of withdrawing our endorsement of a process that had become effectively a means of altering the existing FERC

¹ The Pennsylvania Small Generator Coalition includes: The Solar Energy Industries Association, PV NOW, Mid-Atlantic SEIA, Celentano Energy Services, Powerlight, Sun Edison, LLC, and the Joint Supporters, a voluntary association which for this purpose comprises: The E Cubed Company, LLC, Climate Energy, LLC, Northern Power, Inc. Turbosteam, Inc., Energy Concepts Engineering, PC, Equity Office Properties Trust, US Microgrids (a PennCat Company), American DG, Tecogen, Capstone Turbines, Gas Technology Institute, Allied Utility Network, and RETX Energy Services.

guidelines to be more favorable to utility interests at the expense of small generator interconnection.

SGC appreciates that the Commission made modifications to MADRI, but we respectfully request the Commission go further to *encourage* small generator interconnection in Pennsylvania, as opposed to merely removing some of the barriers to its employment.

Further, the MADRI process does not satisfy the legislative requirement that the Commission set out a framework "consistent with rules defined in other states within the service region of the regional transmission organization that manages the transmission system in any part of this Commonwealth."

The MADRI working group document is itself not reflected in any other states' rules, and is in many places inconsistent with them. Further, as was repeatedly noted in the process and in the final document, it itself derives originally from the FERC model, and cannot be regarded as even a "second-generation" derivation of any state rules.

For ease of reference, comments are keyed to the section titles in the proposed rulemaking order where applicable.

Specific Comments Requested by the Commission:

1. Definition of "Affected System" and its impact on the applicable review level.

The SGC believes that this section is effectively functionally irrelevant, and that accordingly there is no need for a section on Affected System in the Pennsylvania rules. There is not generally speaking an equivalent section in other state rules. The idea of an affected system is drawn over from the FERC standards for interconnection, where one *transmission-level* interconnection may "affect" another transmission provider, hence the need for coordination. There is no direct applicability to interconnections under state jurisdiction in the presence of a functional RTO.

Further, in the case where a generator interconnection may affect another utilities system, it can only do so through the transmission grid thus raising a question wholly within the jurisdiction of the FERC. Such an interconnection request would accordingly have to be processed under PJM's interconnection rules for proper impact analysis on the transmission grid.

This section underscores the problems with reliance on the MADRI interconnection suggestions, themselves based on federal interconnection standards instead of state-based interconnection rules. The idea of an affected system is appropriately excluded from the New Jersey interconnection rules and only appears in the "Level 3" portion of the recently promulgated interconnection rules in Colorado². (Because Colorado does

² See Decision No. C05-1461, DOCKET NO. 05R-112E, PUBLIC UTILITIES COMMISSION OF THE STATE OF COLORADO.

not have an RTO that processes interconnection applications, the Colorado utilities would study complex interconnections that "affected" another system themselves (although such process would still be subject to FERC jurisdiction under the utility's Open Access Transmission Tariff.)

2. Extension of timelines in emergency circumstances.

SGC understands that there may be a need to extend an EDC's timeline as part of the interconnection application process under rare emergency circumstances. We do not see the need to create a specific procedure in this case, but instead rely on the procedures utilities traditionally follow when an emergency exists. We expect Commission oversight of any declared emergency to ensure utilities are relieved of their obligations and that the invocation is not used frivolously.

3. Level 2 reviews restricted to inverter based equipment.

Subsection (d)(2) The guidelines for Level 2 set forth under this subsection suggest the rules would only apply to inverter-based interconnections. This is a major departure from FERC Order 2006, which uses nearly identical screening criteria to those proposed in the draft rule, yet allows all types of generators to be interconnected under their equivalent "Level 2."

Adopting this restriction would create a prominent seam between the federal and state rules. There were no concerns raised in the consensus filing before the FERC about the availability of the screens to all generators. Had there been a concern that the expedited screening process should not be available for non-inverter based equipment, surely the Edison Electric Institute, the National Rural Electric Cooperative Association or NARUC representatives would have raised the concern before filing the proposed interconnection standards before the FERC. However, no such concern was voiced and all of these parties agreed to the application of the expedited screening process to all generators; we feel that the Commission should do the same.

The impact of this departure from the FERC rule will fall disproportionately on the agricultural community. While virtually all solar installations will use inverters, many of the bio-digesters may rely on rotating equipment. Like inverters, this equipment can be certified and provided in packaged systems; there is no need to subject these simple installations to the arduous and costly interconnection processes outside of Level 2. The Commission should follow the FERC guidance and allow non-inverter equipment to be processed under the Level 2 interconnection screens.

4. Review of an increase in capacity at incremental addition or total rated capacity.

Subsection (f)(2) The Commission proposed in this subsection to apply the interconnection rules to the *total* new capacity of a generator instead of the *incremental* addition, meaning in practice that a 2 MW generator adding five kilowatts of capacity

would be treated as if were an entirely new installation of 2.005 MW. This could potentially force small generators to undergo expensive and needless studies.

Because all of the processes under levels 1 through 3 already require that aggregate existing generation be taken into account in the screening process, there is no need to treat each increment of addition to the generating capacity as an entirely new generator.

What the Commission may be attempting to prevent is a generator using sequential incremental additions to a single installation as a means of circumventing the application of a more intensive interconnection review and study. However, because the first and most critical screen on Levels 1 and 2 limit the total *aggregate* generation on a particular circuit to 15 percent of the peak load, no amount of incremental additions can overcome this threshold. Once it is reached, all new generators (or incremental additions) will need to be processed under the more intensive Level 3 review.

Moreover, the feasibility study associated with Level 3 review, essentially the backstop to all other expedited Levels, can and should take into account whether more than just the incremental addition needs to be evaluated. If it does, the 3 part study process under Level 3 is perfectly suited to address this expanded scope.

Levels 1, 2 and 4 already internally prevent circumvention by incremental addition, and the Level 3 process is sufficiently comprehensive and flexible to address an incremental addition in the context of the total generation on any circuit. There is no need to evaluate each interconnection request as if it were new – accordingly the Commission should allow incremental additions to be processed under the appropriate Level based on the increment alone.

5. Cost responsibility of a single point of interconnection for several customer-generators.

SGC suggests it is appropriate to share the cost based on a proportion of the size of each generator interconnecting. PJM uses this approach in partitioning costs of major interconnections and we believe this can be followed at the State level.

6. External disconnect switch/lock box.

Subsection (f)(9) and (f)(10) SGC was surprised to see the Commission's reversal in this draft order, which now requires either an external disconnect switch (isolation device) or utility access to the disconnect switch by way of a lock box.

Adding a redundant utility-accessible isolation device is unnecessary when the inverter already meets the IEEE 1547 standard for disconnecting from the grid when there is a power outage and is designed to always disconnect. This renders the inverter-based distributed generator completely harmless to the utility line worker and is substantially different from small backup generators that can still back feed onto the grid under these conditions.

Installing an additional redundant manual isolation device adds unnecessary cost (which can average \$300 to \$600 including labor and equipment), time (average 3 to 6 hours) and resources (sometimes requiring trenching, drilling, etc.). In addition, the National Electric Code requires multiple manual disconnect devices which must be available to emergency personnel and can be used to disconnect any small generator. As a final fail-safe, removal of a revenue meter is simple means of providing an absolute disconnection.

If we examine one technology for a relevant example, SEIA would note that among the more than 27,000 interconnected solar systems in the US, some operating for decades, there has never been a single failure of any solar system in the "on" mode. Moreover, among these multiple tens thousands of hours of operation there has never been a death, injury, or even an insurance claim related to a malfunction of certified small generator safety equipment. Notwithstanding, standard utility safety practices require line workers to ground every portion of line on which they are working and to work on the line as if it were live. Where grounded, it becomes impossible for a small generator to accidentally reenergize a circuit and pose a risk to line workers. Based on this, it would require multiple highly improbable and unprecedented failures of redundant safety systems and practices for any utility workers to be injured – adding additional expensive equipment to this redundancy without any real-world evidence of a safety concern is unnecessary.

7. Spot networks - set kilowatt limitation or percentage limit.

As the Commission notes in its definition, spot networks typically serve a single customer or just a few customers, as distinct from the area networks which serve large downtown areas in an urban core.

Because spot networks serve just a few customers, the rules regarding interconnection to these more sensitive areas can be more relaxed. Of course, unlike radial circuits, spot networks use devices that detect potential back feed from a generator, so extra care must be taken when approving an interconnection without study.

However, provided there is a high degree of assurance that no back feed will occur, generator interconnections can still be approved expeditiously.

Colorado and New Jersey allow expedited interconnections to networks. Only Colorado imposes a total size limit (300 kW) and then only in the circumstance where the spot network is serving more than a single customer³. While the SGC does not believe this limit is necessary, it would be far more encouraging of solar installations than EAPA's proposed novel 50kW cap.

³ See Attachment A (b.ii.(1)l.), Decision No. C05-1461, DOCKET NO. 05R-112E, PUBLIC UTILITIES COMMISSION OF THE STATE OF COLORADO.

Our experience regarding expedited interconnection to spot networks in other jurisdictions is as follows:

Jurisdiction	Level 1	Level 2	Level 3
Colorado	not allowed	Single customer network: inverters up to full peak load if reverse power relays used, otherwise, same as multiple customer. Multiple customer network: inverters up to 5% of peak load up to 300kW	All others – study performed
New Jersey	not allowed	Single and Multi customer: up to 5% peak load unless reverse power relays used then up to full peak load.	All others – study performed
Pennsylvania (proposed)	Allowed up to 5% of peak load	Single customer: inverters up to 5% of peak load. Multiple Customer network: not allowed.	All others – study performed

As should be clear from the above, except for the allowance of Level 1 review for spot networks, Pennsylvania is *already* the most conservative among the states with recently promulgated rules for spot networks. Absent a specific technical reason to further increase the burden on small generators as compared with other recent rulemakings, the SGC believes a more conservative rule is not consistent with a philosophy of encouraging small generator interconnection.

8. Timelines for application review.

We believe all of the time requirements set forth in the draft can be shortened - some significantly. We appreciate that the modified language in this tentative order clearly defines the time requirement for Level 1 as 25 days, rather than the misinterpreted 35 days stated in the last order. Nevertheless, we would urge the Commission to adopt timeframes more consistent with those used in New Jersey for the corresponding interconnection levels. New Jersey struck the proper balance between the generators' desire to have a quick approval with the legitimate time a utility needs to process these simple interconnections.

While SGC understands that utilities will always desire to have as may be required in the worst case *for each segment* of the interconnection process, the *cumulative* impact of accommodating this desire is unreasonable. If the Commission believes it must accommodate the worst case scenario to process the interconnection in any given segment, it should be understood that a utility that takes the full time in any segment should not be allowed to let an application languish in every segment. To address that, we would recommend an overall time limit on the processing as follows:

Level 1	- 20 business days (i.e. one calendar month)
Level 2	- 25 business days
Level 3	- 180 business days (subject to extension by mutual agreement)

Level 4	- 30 business days (i.e. 6 calendar weeks)
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Under this framework, while a utility might take the full time for processing any particular time segment, it would then need to expedite another segments to meet the overall deadline⁴.

It is not unreasonable to estimate that Level 1 applications should take no more than 1 hour to process, and Level 2 about 3 hours. An ideally efficient utility could receive a completed application one day and notify an applicant in the next day whether it was approved or not under the Level 1 or Level 2 screening processes. A utility that desired to make the interconnection process as efficient as possible by allowing Internet-based application and computer lookup of the relevant information could theoretically even provide same day interconnection approvals. In light of this possibility, the time frames the Commission has suggested do not comport with the notion of *encouraging* small generator interconnection, and are not consistent with rules defined in other PJM states.

By way of background, some Level 2 solar installations can take less than one week from groundbreaking to the time they are ready to energize. It does not seem to fit with the concept of expedited interconnection to then require these generators to sit idle while a utility takes weeks or months to process paperwork and execute a very brief engineering analysis.

9. Fault current percentage limitations.

Subsection (h)(2)(iv) Potentially the most problematic departure from the FERC, New Jersey and even the MADRI interconnection suggestions is the Commission's proposal in this subsection. Here, the Commission has proposed lowering the screen examining maximum fault current on a line to 85 percent of short circuit interrupting capability. This is too restrictive and is an unjustified alteration of the technical screen. SGC notes that the MADRI suggestions, on which the Commission has suggested its draft is based, sets this threshold at 90 percent, consistent with the New Jersey and NARUC interconnection models.

The troubling aspect about this departure is the SGC is unaware of any analysis of the number of utility circuits this change could affect. While we would not be concerned if the change removed only one or two percent additional circuits from expedited interconnection, it would be disastrous to the entire effort to promulgate rules to encourage interconnection if hundreds of circuits were removed from expedited treatment because of the change in this single screen. We believe it is imperative that at

⁴ The times to complete interconnection studies in Colorado are 15 business days for Level 1 and 30 business days for Level 2. While the Level 2 rules indicate an executable interconnection agreement must be provided on the 30th day under level 2, the Level 1 rules only require that the studies be completed on the 15th day and then has a separate process for scheduling and witnessing the commissioning of a Level 1 generator. See ⁴ See Attachment A, Decision No. C05-1461, DOCKET NO. 05R-112E, PUBLIC UTILITIES COMMISSION OF THE STATE OF COLORADO

a minimum, information on the number of circuits affected be provided to all parties prior to adopting this change.

There appears to be no technical basis for this new lower rule. While some utilities have proffered analysis that suggests a lower limit is needed to address error in fault current determination, this analysis is misinforming.

The original purpose of this particular screen was to ensure that utilities that had already scheduled a circuit for upgrade where protective devices were nearing or exceeding their total fault current rating did not have that situation exacerbated by the addition of fault current from distributed generation. . Most utilities upgrade when a device reaches 90 percent of its rating, although many do not plan the upgrade until 100 percent.

While the utilities articulated a concern that fault current above 80 percent of device rating should limit generator addition, this argument is wholly disingenuous. Many utilities operate circuits with fault current at or near device rating. In this case, engineers are counting on the low probability that in the course of day-to-day operation, full fault current will be delivered to a protective device resulting in its failure. Yet when it comes to allowing distributed generation, those devices are being held to a significantly higher margin of safety than normal utility practice. This is tantamount to discrimination and is the very type of barrier the Commission should be removing.

To most accurately align with actual utility practice, the Commission could change this screen to parallel the circuit upgrade requirements related to fault current that each Pennsylvania utility employs. Thus, if a utility's operational and planning criteria is to upgrade only when a device on a circuit reached 100 percent of fault current rating, the Level 2 screen would fail generators on circuits where fault current was at or exceeded 100 percent. Where a utility used a 90 percent upgrade criteria, the number in the screen would be 90 percent.

SGC is highly skeptical that any utility in Pennsylvania uses a threshold below 90 percent. SGC would ask the Commission to revisit this requirement after it has determined the upgrade criteria used in the State related to fault currents.

10. Area network applications - 50 kW limitation or percentage cap.

Expedited interconnections to area networks are one of the most important aspects of a rule promoting distributed generation as these networks serve large urban areas – the areas most likely to see the greatest benefit from distributed generation. The proposed rule would cap the total generation at an amount so low as to ensure this potential is not realized.

By contrast, both the states of Colorado and New Jersey allow a much higher level of interconnections to area networks. Under their Level 2 process, the New Jersey interconnection rules allow exporting, inverter-based generators up to the smaller of 10 percent of the network minimum load or 500kW. This total amount is so small as to

virtually guarantee no power will ever leave the network and flow backwards through the network protectors. (In fact, there have been no reported problems in the several years and several hundred comparable installed systems in New Jersey). For non-inverter-based generation, or inverters above the aggregate limit, the generator must affirmatively ensure the power does not leave the customer's site. If no power leaves the site (including inadvertently or under fault conditions) it cannot possibly affect the network protectors.

Customer-generators on networks could easily provide this assurance. Customers using inverters could easily show this as inverters operate many times faster than utility protection equipment (including network protectors.) For non-inverter based interconnections, high speed relays that operated within ¼ of a cycle (or faster than four one-thousandths of a second,) could provide sufficient assurance.

The New Jersey rule balances the reliability interests of the utility with the desire to allow distributed generation installations in urban areas. The first part of the New Jersey rule allows small net metered systems to be installed. The second part allows larger generators, but limits them to meeting no more than 100 percent of a customer's on-site load.

In Colorado, the Public Utilities Commission allows Level 2 interconnections to area networks up to 500kW or 10% of peak load⁵. This is very close to the New Jersey standard..

In order to ensure the safe application of distributed generation technologies in congested urban areas, the SGC urges the Commission to allow a more reasonable limit for area network interconnections under the Level 2 process, rather than introducing another regional regulatory "seam" operating to the detriment of small generators.

11. Mandatory Level 4 review.

While the SGC believes the Level 4 review for larger generators that do not export power to the grid is a correct step forward, the strict adoption of the MADRI document incorporates a very confusing aspect of Level 4 review. SGC would request the Commission jettison all of the language from Level 4 procedures that do not deal with the larger non-exporting generators, as this only serves the purpose of making the rules more convoluted than necessary.

The Commission should incorporate the expedited interconnection rules for networks as proposed herein, which would allow the deletion of this confusing text .

⁵ See Attachment A (b.ii.(1)l.), Decision No. C05-1461, DOCKET NO. 05R-112E, PUBLIC UTILITIES COMMISSION OF THE STATE OF COLORADO

12. Customer-Generator insurance requirements.

SGC agrees with the Commission that indemnification or liability insurance issues should not be addressed in the body of the regulations; rather it can be presented as information for the customer-generator in the interconnection agreement form, as in the MADRI procedures. To be consistent with New Jersey and the MADRI procedures, liability insurance should not be a requirement for interconnection in Pennsylvania.

Other comments:

Interconnection Working Group

Inevitably some real – world implementation concerns and issues will escape the scope of this rulemaking while still having the ability to substantially affect interconnection outcomes. Accordingly, we recommend that the Commission establish an interconnection working group like the one currently in operation in New Jersey to work out procedures, process, and unresolved issues as necessary. We recommend that the group have representation from the small generator community and from the EDCs, and that a PUC staff member be assigned to collect and implement the recommendations of the group as appropriate via the PUC procedures.

1.2 Definitions

“Certificate of Completion”. The idea of the use of this certificate is good, however, it may be very problematic in practice. The key piece of information contained on the proposed certificate of completion is the authorization or signature from a local code official..

However, Pennsylvania code officials may be reticent or refuse to sign an unknown form (and one not required from their superiors), thus creating an insurmountable barrier to the completion of the interconnection process.

We do not simply discuss this matter in theory but rely on the empirical experience in New Jersey where this precise issue was faced. For that reason SGC recommends that unless and until the PUC receives an acknowledgement from the local code officials that they are willing to sign a Certificate of Completion, the use of this document exclude the requirement to have local code official signature. In place of the signature, a photocopy of the final authorization that the code official provides (sometimes a sticker placed on the electric supply panel at the customer’s site) be used instead.

We would encourage the Commission to open a dialog with local code officials about the proposed Certificate of Completion. By undertaking that task the Commission will discover directly whether this document will ease the interconnection process or form a new barrier and potentially head off a host of additional and unforeseen problems. The

Commission will also then have direct input on the appropriate time to shift to use of the standardized Certificate of Completion.

1.3 General Interconnection Provisions

Subsection (f)(6) SGC agrees that a modification to an application must be re-filed if there is a substantial change. However, in a circumstance where the change to the generator equipment or size is irrelevant to the processing of the technical screens, such a change should not trigger re-filing. Accordingly, we suggest that any change that does not affect the processing of the screens in Levels 1, 2 or 4 should be allowed. (For instance, a residential customer that proposed to install a 3 kW PV system then changed that after submission of the application to be a 1 kW system, they would be allowed to do so, as a decrease in size would not affect any screening criteria.)