

Interstate Renewable Energy Council, Inc.'s Initial List of Topics for Discussion Regarding the Regulated Utilities Proposed Technical Interconnection and Interoperability Requirements

March 20, 2018

The Commission requested that members of the Phase 2 working group provide a proposed discussion topic outline or red-lined/track changes draft of Regulated Utilities' TIIR proposal, and asked that it include a description of the purpose/role of the statewide technical requirements. To be clear from the start, IREC is in support of the TIIR, but as outlined in our comments, we also would like to see revisions and expansion of the document to include most technical requirements that significantly impact DER development.

IREC has not done a full scale redline of the document yet, partly due to time and resources, but also because many of our questions about the document focus on what is not in the document rather than what is.

In IREC's view, a statewide technical standards document serves a number of important functions (which we will just refer to hereon out as the TIIR for ease of use). In some ways much of the value of the TIIR actually comes through the discussion leading up to its creation wherein parties can collectively discuss the purpose of each requirement and whether it is appropriate. The document itself provides an important purpose for customers and project developers by providing them with a clear understanding of the technical requirements that apply to their project. By being consistent across the state it enables developers to streamline their development process and it also makes it easier to raise concerns about requirements and get them addressed efficiently (vs. having to seek a change with every single utility with whom they do business). A TIIR can help developers understand the expectations of their projects and thereby better assess the costs and timeline associated with project development in the state.

Below is a list of particular topics and areas that IREC believes warrants discussion and potential modification through the working group process.

1. Focus on Technical Requirements –

Pages 4-6 – These introductory pages contain numerous explanatory policy statements that are not needed or appropriate for the TIIR. They set forth various opinions about DERs and management of the electric system that do not serve any direct purpose in guiding interconnections. IREC would rather remove those statements and just focus the document on what the technical requirements are to avoid the need for debate about these different policy provisions.

For example:

- “With so many variations in Area EPS designs, it becomes complex to create a single set of interconnection requirements that fits all generation interconnection situations for all distribution systems. The Area EPS Operator must maintain a level of engineering judgment in order to interconnect the wide range of technologies over a variety of Area EPS and DER characteristics and designs.”
- “In addition to allowing for differences in distribution and information systems design and operation, the Area EPS Operator TSM allows for expedited adoption of new industry standards and

best practices as they become available without creating conditions where the statewide interconnection standards and national standards become out-of-sync.”

- “The nature of an Area EPS is one of many radial circuit configuration possibilities that are often used for maintenance and contingency operations. Due to practical limitations of tools and resources, each these numerous possibilities cannot be reviewed during the interconnection process. The Area EPS Operator shall consider the anticipated DER impact on the three types of constraints, for operating in normal and abnormal configurations, when specifying requirements in the Area EPS Operator’s TSM.”

2. Unclear Requirements re: Settings

Page 6 the TIIR states: “DER Operators with existing DER capable of addressing grid constraints shall constructively participate with the Area EPS Operator to determine if using existing DER capabilities can resolve grid constraints. The existing capabilities that may be implemented in the future include, but are not limited to, real and reactive power control functions and interoperability.”

As designs and production can be impacted by real/reactive power functions, a priori knowledge of required settings is best. Additionally, updating settings or adding communications capabilities at a later date are costs that cannot be planned for. Further consideration should be given by the working group to whether or not default settings need to be changed or updated as part of the interconnection process in relation to Hosting Capacity Analysis or constraints identified by further study.

Also on page 6, it says: “The DER shall not create or contribute to an intentional Area EPS island, unless approved by the Area EPS Operator. “ IREC does not disagree with this statement except it seems to be randomly placed at its current location and may require additional explanation as to how or when an island would be approved.

3. Mutual Agreement Can Supersede Standards

Page 7 of the TIIR states: “In the event of an inconsistency between various laws, rules, standards, contracts, or policies over interconnection requirements, the resolution to this inconsistency will be resolved by assigning an order of precedence from highest to lowest as follows:

1. State of Minnesota statutes
2. Minnesota Public Utility Commission approved standards or tariffs
3. National Standards, Codes, and Certifications
4. Agreements between the Area EPS Operator and the DER Operator
5. Area EPS Operator published documents”

IREC recommends that the order of items 3 and 4 be switched as it is possible for mutual agreement between a DER operator and an Area EPS operator to supersede standards and in some cases this may be desirable to allow for evolution in technology and design.

4. Non-exporting and limited export systems require more discussion

Page 8 of the TIIR states that “Nonexporting DER that operate in parallel with the Area EPS are subject to these technical standards.”

IREC recommends that the working group conduct a robust discussion about the possible differences in requirements for non-exporting systems, such as applicability of voltage regulating functions.

5. Authority over non-parallel projects

Page 8 of the TIIR states that the “Area EPS Operator’s TSM may address other types of interconnections which do not include parallel operation.” It is not clear to IREC whether the utility necessarily has authority over *all* types of non-parallel operation. And to the extent a utility does have authority over certain types of non-parallel systems it is unclear why those requirements should be addressed in the TSM instead of in the TIIR. This is the sort of issue that raises particular concern when it comes to having individual utility TSM’s that may overstep the authority of the utility.

6. Aggregate DERs

Page 9 states: “The functional requirements for a DER may arise from impacts from the DER or an aggregation of DER on a portion of the Area EPS. The need to consider the aggregate DER may depend on several factors including, but not limited to: the operating characteristics of the DER; the existing DER penetration level; and the forecasted DER penetration level.” This is a wide-sweeping statement that raises numerous flags about how a utility may be able to examine an individual DER applicant in relation to other nearby projects. However, it is not clear at this time what the purpose or effect of the statement is at this point.

7. The TIIR should address protection system details and application of real and reactive power control functions

Page 9 of the TIIR states: “The following non-exhaustive list describes what remains outside of the scope of the TIIR:

- i. Process requirements
- ii. Cost allocation
- iii. Interconnection to transmission systems
- iv. Protection system details of Area EPS or DER
- v. Requirements or specification of system impact or facilities studies
- vi. Application of real and reactive power control functions
- vii. Details of communication networks including architecture, technology and protocols, or other specifications related to interoperability
- viii. Details of metering requirements and specifications
- ix. Planning or operational considerations associated with Affected Systems, Regional Transmission Operators, or Transmission Owners¹
- x. Intentional Area EPS islanding

(see also similar statements on page 7 re: protection requirements)

IREC disagrees with this list and believes that both the “protection system details of Area EPS or DER *and* application of real and reactive power control functions, should be addressed, at least on some level in the TIIR. These are clearly technical requirements and they are not discussed in the interconnection procedures. It also is not clear what is meant by the “requirements or specifications of system impact or

¹ The Area EPS should follow any applicable MIP or MIA processes related to coordination with the TPS Owner, RTO, and other entities as appropriate.

facilities studies.” To the extent there are additional technical requirements needed for these studies then it is likely that the TIIR is the best place for that discussion. Items vii – x also contain broad or even specific technical requirements that should be included in the TIIR and should be discussed within the working group. For example, it is unclear why the metering requirements would need to be different between utilities instead of something that could be addressed statewide in the TIIR.

8. Should SunSpec be Listed?

On page 10 of the TIIR it references 2030.5 and DNP3, but not SunSpec (which is one of the three options available for DER communication capability in IEEE 1547-2018) – should it be included as well?

9. Definitions for Inadvertent Export and Limited Export Warrant Consideration

IREC believes the definition for Inadvertent Export may need to be revisited following discussion of the standards and we believe a definition of Limited Export (or net-nameplate capacity or similar concept) may also be warranted.

10. 1547 does not remove the AGIR’s authority to regulate

The TIIR at page 19 states: “The Area EPS Operator assigns normal performance categories - Category A and B. The AGIR, which in Minnesota is the state Public Utilities Commission, assigns abnormal Categories I, II, and III.” However, 1547 actually states: “The applicability of certain specifications and requirements are dependent on application considerations. For these, the requirements are provided in terms of a limited number of technology-neutral performance categories, for which it is the responsibility of the authority governing interconnection requirements (AGIR) to determine applicability.” Also see Annex B.

It may be debatable exactly who the AGIR is, but there’s no indication in 1547 that the AGIR relinquishes authority to the Area EPS operator to determine normal performance categories. Indeed, the list of authorities on page 7 shows that the Commission and MN law retain their authority to determine the technical standards. However, IREC does not take issue with the reasonable assignment of normal performance categories on page 20. In addition, even each of the hundreds of utilities in Minnesota are able to set their performance categories, this does not mean that the Commission lacks the authority to require these to be designated in the TIIR or TSM and be subject to reasonableness review by the Commission.

11. The abnormal category assignment should not be done case by case

On page 20 the TIIR states that all other instances of abnormal performance should be reviewed on a case by case basis. IREC disagrees that this should be done on a case-by-case basis. The goal should be to collaboratively select a category, perhaps based on DER type, that can apply in the TIIR. If it becomes apparent that differences between Area EPS operators are necessary, a TSM could be used with guidance from the PUC. Allowance for “upgraded” category assignment on a case-by-case or otherwise basis could be made with mutual agreement or within other parameters that the working group agrees are reasonable. Minimum performance category should always be met unless further study in coordination with MISO determines that a lower performance category is reasonable for a particular interconnection.

12. Voltage and Reactive Power Control

On page 22 the TIIR requires DER be installed with constant power factor mode with 0.98 power factor settings. Volt-var is the preferred mode as an alternative for constant power factor, as it does not cause power flow when unnecessary. Thus it limits the utility need to provide reactive power and reduces possible DER performance losses. Watt-var is another better alternative to constant power factor that could be designed to limit reactive power flow. The possible benefits of both should be considered by the working group as a default setting.

13. Protection requirements may need to be in the TIIR

On page 23 the TIIR states that “Details of each Area EPS Operator’s protection requirements shall be found in the Area EPS Operator’s TSM.” IREC would like to see an elaboration of what details would be contained in the TSM, and why, rather than the TIIR. Until hearing persuasive arguments otherwise, it is our belief and preference that protection should be addressed consistently in the TIIR.

14. Communications

On page 26 the TIIR states that: “When communication is required to the DER and/or metering, the DER Operator may be responsible for furnishing the communication channel from the Area EPS Operator’s applicable system(s) to the DER and/or the meters.”

This broad statement is rather unconstrained. It should specify that the Area EPS system would extend to the physical local EPS area, and only a connection need be made between the DER and the Area APS equipment. Further details about the local DER interface could be defined in the TIIR.

In addition, in general IREC believes the working group should have a robust discussion of communications and determine what, if anything, is appropriate to include in the TIIR and what can be left to a TSM. Even where it is appropriate to include specific details in a TSM we believe the TIIR may need to provide some overarching guidance and constraints on the ability for utilities to impose unreasonable communication requirements.

15. Energy Storage

On page 28 the TIIR states that: “ii. The control modes applied for shall be documented in an Operating Agreement. Changes to control modes shall follow all applicable agreements and Area EPS Operator requirements. iii. A method of control mode security shall be furnished to by the DER Operator to assure only control modes applied for and reviewed by the Area EPS Operator are used. The security may be in the form of password protection of the functions or other methods specified by the Area EPS Operator’s TSM.”

It’s unclear exactly what “control modes” refers to, but customers should have the ability to control how their storage systems are utilized without permission of the utility, within reasonable constraints. Non-export, NEM-only charging or other “NEM integrity”-related controls may indeed need access restrictions and/or additional agreements, but these need to be vetted in the working group.

On page 28 the TIIR states that: “Load impacts of ESS shall be considered in scope for the Minnesota DER TIIR.”

There may be an appropriate level of review for load aspects but these need to be reviewed by the working group. We need to ensure that charging energy storage is not held to a separate set of rules compared to other customer load, unless the working group deems some restriction or review is necessary. We are also supportive, however, of ensuring that there is one streamlined review process for the load and generation effects on the system and encourage the Commission to use this opportunity to ensure there are not duplicative or overlapping requirements between the load and interconnection rules.

16. Non-Exporting and Inadvertent Export

On page 29 the TIIR states that: “ii. The total nameplate rating of all DER onsite is less than 100 kW.” This level should be reviewed in addition to all other inadvertent export technical requirements (which are a mixture of existing rules in other states).

IREC is prepared to offer model limited-export language in anticipation of Hosting Capacity utilization, which would also cover the non-exporting case. We look forward to a robust discussion of non-exporting, inadvertent export and limited export rules and requirements.

17. Test and Verification Requirements

On page 31 the TIIR states that: “The DER Operator shall provide written test procedure to the Area EPS Operator for review.”

The working group should review whether or not this is appropriate and/or whether more standardized tests can be included in TIIR. This is something that very likely can be standardized and would be a significant benefit to the customers if it was.

18. Agreements

The working group should review what levels of changes to the system require notification to the utility or new/updated interconnection agreements. This would include issues such as:

- i. Small DC capacity changes
- ii. Large DC capacity changes
- iii. Small AC capacity changes (due to replacement inverter/interface)
- iv. Large AC capacity changes (due to replacement or additional inverter/interface)
- v. Whether or not power limitation can be used to match a larger DER rating to the old rating contained in the agreement
- vi. Changes in equipment that do not affect system output power
- vii. Adding storage hourly capacity
- viii. Implementing new settings (e.g. per new standards like 1547-2018) on replacement DER equipment