



DATE: October 31, 2017

TO: Jason Pause, Electric Distribution Systems,
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Department of Public Service
3 Empire State Plaza, Albany, NY 12223

FROM: Joint Utilities of New York – Interconnection Technical Working Group

RE: 10/16/17 ITWG Meeting Follow-Up – Joint Utility Response to EPRI Screening Report

Pursuant to your request, here is the response from the Joint Utilities of New York (JU) regarding the Electric Power Research Institute (EPRI)'s recommendations in the report "Recommendations for Harmonizing Distributed Generation Interconnection Practices in NY State: Technical Review Processes" (EPRI Screening Report). The response reflects the position of all of the utilities identified on this letterhead, although it does not necessarily apply to network systems.

Introduction

The JU appreciate the opportunity to revamp the screening criteria within the New York State Standardized Interconnection Requirements (NYSSIR), and support EPRI's position on many items. However, after reviewing the EPRI Screening Report, there are some remaining concerns among the JU regarding voltage fluctuation and flicker, grounding, and automation, as well as several administrative and logistical items. This document is organized by section within the EPRI Screening Report and focuses on those areas of concern or need for additional clarification.

On October 23, 2017, the JU received an update to the EPRI Screening Report that included Energy Storage screens. The JU will consider these updates in the JU Proposed Energy Storage Screens to be submitted on November 6, 2017. This document solely comments on the initially submitted EPRI Screening Report.

1. General Feedback and Discussion

Any references of "50 kW to multi-MW systems" should be updated to "50 kW to 5 MW" to remain consistent with the NYSSIR.

2. Recommendations for NYSIR Technical Review Processes

On page 13, the JU agree with having a mechanism developed in the Interconnection Policy Working Group (IPWG) for resolving unforeseen site incompatibilities, as well as changes in performance after installation. To maintain system safety and reliability, stronger language must be added to Appendix A of the NYSSIR to ensure that power quality issues detected post-interconnection will be resolved by the customer. However, this does not displace the requirement to design screens that ensure any potential voltage fluctuations or flicker concerns are captured in the preliminary screening analysis.

3. Preliminary and Supplemental Screens

Preliminary Screens A – F

The JU have the following comments and recommendations regarding EPRI's proposed preliminary screens:

- On page 16, remove any references to systems greater than 5 MW as those systems are outside the jurisdiction of the NYSSIR.
- With respect to Screen B on page 18, require that solar PV interconnections utilize smart inverters certified to UL-1741-SA in the next NYSSIR revision. This will support higher levels of future hosting capacity.
- On revised Screen C on page 19:
 - The transformer and secondary system should be considered in addition to the medium voltage system. While we may not be able to automate this function, it should be evaluated. EPRI discusses this point further on page 22 regarding Screen E, but does not provide a specific recommendation and limits the discussion to shared secondary only.
 - To the extent it is not covered within the revised Screen D, overloading, voltage and current unbalance (between the center tap, application of a single phase generator to a

3 phase facility, or application of a large single phase facility on any feeder) must be screened within Screen C.

- The JU supports EPRI's approach of considering aggregate DG. For consistency with Screen E, this should be incorporated into the screen: "Is the Electric Power System (EPS) Rating Exceeded *when incorporating maximum aggregated Distributed Generation?*"
- Regarding revised Screen D on page 21, for line configuration compatibility and grounding coordination, the screen should specify the specific criteria used, such as; wye grounded-wye, wye grounded-delta, etc. This includes review of not only the transformer configuration, but the inverter configuration as well. This will require manual engineering review of drawings that indicate transformer and inverter configurations which will make full automation difficult to achieve. Additionally, it is the responsibility of the developer to ensure the secondary voltage connection is appropriate (e.g. 208V vs. 240V), and therefore this should not be a specific component of the screen.
- With respect to Revised Screen E on pages 21 to 23, data may not always be readily available from mid-line reclosers to evaluate line sections in the screen at this time, whether this screen is performed manually or automatically. But the screen should still be included and applied when data is available.
- Regarding Revised Screen F on pages 23-27, the JU agree that the screening will be manual, and have the following comments:
 - **The JU need to ensure the potential for voltage issues is identified during preliminary screening.** The JU cannot rely on voltage screens in the supplemental screening if a system passes all other preliminary screens without review for voltage issues.
 - **The JU expresses significant concerns with Table 2.** It is specific to only certain primary voltage classes and conductors and is representative of only a few of the many configurations used throughout New York. In addition, the data in the table appears only applicable to a distributed generation project that would be located on the 3-phase main line portion of a feeder and does not consider feeder laterals. Finally, it does not recognize the potential for transitions in conductor sizes, number of available phases, or voltages (i.e. stepdown transformers) along a feeder or impacts on voltage regulating devices. Applying a table is not a practical approach for this screen.
 - The JU recommend the references to the secondary voltage be removed as this primarily pertains to systems with nameplate ratings less than 50kW which are not a part of the preliminary screening process.
 - **As an alternative to Table 2, the JU propose screening for Stiffness Factor greater than 25 (Utility short circuit current at the newly proposed point of common coupling / Aggregate Feeder Rated DG current). If the stiffness factor is greater than 25, the screen passes. This is less conservative than many industry experts suggest, including the National Renewable Energy Laboratory¹.** The JU continue to review Pterra's proposed approach. While additional review and discussion is still required, the Pterra methodology also shows promise where the X/R ratio is greater than 5, but it is too

¹ [Muljadi, et.al. "High Penetration Photovoltaic Planning Methodologies", National Renewable Energy Laboratory, February 2017.](#)

complex for a preliminary screen. This still requires additional discussion and review within the ITWG.

- The JU reiterate our recommendation that collaboration with NYSEDA be conducted to determine various impedance conditions of voltage classes on distribution circuits, as well as obtain voltage data from sites in New York to inform an updated screen for the future with potential automation.

Supplemental Screens G – I

The JU have the following comments and recommendations regarding EPRI's proposed supplemental screens:

- With respect to Screen H covered on pages 28 and 29, the JU support a voltage fluctuation test.
 - The JU request clarification on how specific cases would be identified where resonance conditions are suspected and flagged for further study.
 - The JU recommend that in addition for screening for $\Delta V/V$, we screen for voltage outside of the ANSI C84.1 Voltage Range A at any location on the utility system.
 - The JU support using 1.5% voltage fluctuation at the regulator, and recommend enhancing it to include the lesser of 1.5% or half the bandwidth of the regulator.
- Supplemental Screens I, J, and K are analysis requirements rather than screens. The “screens” will require review of design drawings, protective device coordination data, and other materials associated with the extensive analysis completed in the CESIR. **This level of review is outside the scope of the technical screening and the JU require longer than 20 business days for review and anticipate that costs will exceed \$2500.** The JU request that EPRI clarify that differences between the analyses required through these “screens” and a CESIR study.

4. Harmonizing CESIR Studies, Screening and Reporting

The JU support EPRI's recommendation to move towards consistency in the reporting of analysis and results for screening and CESIRs, with the following additional comments:

- On page 31, the JU caution against the expectation of a decrease in required CESIRs as the supplemental screening will remain as an optional step.
- On page 34, the report indicates voltage violations occur when a circuit is near its minimum daytime load, however the JU add that voltage violations also occur as a function of X/R ratios (i.e. source impedance and conductor sizes), voltage classifications, etc. at any time depending upon the severity.
- On page 38, Section 4.3.4 Expected Results, to make the report more concise without sacrificing relevant information, the JU do not recommend listing each element that passes; only those that failed.
- Also on page 38, Section 4.5 Issues Omitted from Technical Review, the JU add that voltage flicker is an analysis that should always be completed, and is not an occasional issue. Furthermore, the JU note that while the voltage flicker analysis cannot always be conducted with time series analysis, it should still be evaluated.
- On page 39, Section 4.6 Operational Protection/Safety (page 39), the JU raise that fuse coordination, grounding, reverse power flow, and anti-islanding evaluation should always be conducted, and not just “as the DG capacity on a particular feeder grows”.

- Also on page 39, Section 4.6.5 Method and Data Requirements, Effective Grounding, the JU recommend effective grounding not just be evaluated in context of the inverter, but at the step-up transformer as well.
- Reiterating an earlier comment, the JU do not recommend listing every item that “passed” as stated again on page 41.

Appendix A: Summary of Screening Recommendations

The JU recommend that the aforementioned screening comments be incorporated into the list of screens. Here are some highlights of those comments in terms of impact to the screening description or inclusion as a screen:

- Screen C – should read as, “Is the Electric Power System (EPS) Rating Exceeded *when incorporating maximum aggregated Distributed Generation?*”
- Screen D – ensure effective grounding is considered, but require the developer to test compatibility with the PCC from a voltage perspective (e.g. 208V vs. 240V).
- **Screen F –should incorporate stiffness factor as a voltage fluctuation test.**
- **Screen H – should incorporate testing for ANSI C84.1 voltage violations, as well as a test for half of the regulator bandwidth.**
- Screens I-K – will require additional time; if this detail is required, a CESIR may be appropriate.

Appendix B: Screening and CESIR Report Templates

The JU have the following comments on Appendix B:

- **On page 44, as per the NYSSIR, the JU note that a schedule is not provided until 25% payment is made to conduct a more detailed estimate and coordinate with routine capital construction projects.**
- **On the final page of the document, as per the NYSSIR, the JU note that a cost estimate will not be provided until after a Supplemental Results meeting.**
- The Preliminary and Supplemental Screening report will need to be updated to reflect any changes recommended in prior sections of this document.

Conclusion

The JU support the majority of the EPRI Screening report. Furthermore, the JU, as supported by developers and DPS Staff in the ITWG meetings, recognize the challenges of automating the preliminary screens and support the recommendation of maintaining manual completion of some components of the preliminary screens. This will allow for some additional complexity that may pass more projects through the preliminary process. The JU look forward to additional discussion regarding our comments and questions.