BEFORE THE
PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Commission's Review of Chapter 4901:1-22 of the Ohio Administrative Code Regarding Interconnection Services	))))	Case No. 18-884-EL-ORD

COMMENTS OF OHIO EDISON COMPANY, THE CLEVELAND ELECTRIC ILLUMINATING COMPANY AND THE TOLEDO EDISON COMPANY

I. INTRODUCTION

Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company ("Companies") appreciate this opportunity to address Staff's proposed amendments, as well as questions Staff raises as the Commission considers amendments to the Ohio rules for interconnection of Distributed Energy Resources ("DERs").[1] The Companies reiterate their support for the development and deployment of DERs, which have the potential to provide numerous benefits to both the electric transmission and distribution systems. However, the Companies urge caution when interconnecting and operating a large number of these resources on the electric distribution system, to ensure the delivery of safe and reliable service to retail customers.[2]

PJM has encouraged changes to the Commission's rules for interconnecting DER.[3] PJM's changes, however, do not adequately account for the engineering design of the Companies'

[1] Failure of the Companies to include comments on any given issue does not necessarily signify agreement nor waiver of the Companies' right to address any topic in their reply comments and subsequent pleadings in this proceeding.
[2] *See*, e.g., *Participation of Distributed Energy Resource Aggregation in Markets Operated by Regional Transmission Organizations* Comments of the FirstEnergy Companies and Eastern Kentucky Power Cooperative, Inc. Addressing the Responses of PJM Interconnection, LLC, to Commission September 5, 2019 Data Requests, Docket No. RM18-9, November 6, 2019.
[3] Id. at p.3 (noting that in response to FERC questions, "PJM…referred to being "engaged" with "several State authorities formally and informally regarding DER ride-through capability, including those in Ohio, Pennsylvania, Washington, D.C. and Michigan.")

distribution systems. Nor do PJM's changes adequately account for the safety and reliability of the Companies' systems. The Companies urge the Commission to maintain rules that empower electric distribution utilities to ensure that generation is interconnected to the distribution system in ways that do not interfere with their ability to provide safe and reliable service to their customers. Further, the Commission should resist any suggestions to shift control of interconnections to the distribution system away from the Companies and other local utilities through the adoption of standards that override the discretion of the local utility. Utilities are the experts on their own distribution systems.

When it comes to interconnecting generation to the distribution grid, the risks can include increased outages, damaged equipment, and safety of customers, employees, and the public. Any amendment to these rules must place safety and reliability paramount to all other issues, and maintain electric distribution utility control of the distribution system.

II. COMMENTS

A. Local Distribution Utilities Are Best Positioned to Ensure Interconnection of DERs in a Manner that Preserves Safe and Reliable Distribution Service

While the Companies support the development and deployment of DERs, the Companies urge caution when interconnecting and operating a large number of these resources on the electric distribution system, to ensure the delivery of safe and reliable service to retail customers. Utilities are the experts on their own distribution systems. Because every system and indeed every circuit is unique, utilities are in the best position to determine the appropriate standards to protect the safety of customers, workers, and the public, as well as system integrity.

An electric distribution utility needs to study and plan the interconnection of a DER to ensure the DER integrates with existing system parameters. Historically, the Companies' electric distribution systems have been designed and planned to operate as a radial system, in which power

flows in one direction. In order for the electric grid to function, there is a balancing which occurs to maintain proper steady state voltage and maintain proper coordination of overcurrent protective devices. DER introduces power flow in multiple directions and has the potential to upset this balance. As DER penetration increases, particularly if many small dispersed DERs are aggregated and/or effectively 'dispatched' by an aggregator, the Companies will see new challenges such as overloaded conductors, protective device miscoordination, and over-voltage and under-voltage conditions. The electric distribution utility needs an opportunity to study each interconnection application and any operational changes which deviate from the initial application to properly address these challenges.

PJM has suggested changes to the Commission's rules for interconnecting DER, with the objectives of enhancing optimization of the transmission system and revenue opportunities for wholesale market participants. PJM's changes, however, do not adequately account for the engineering design of the Companies' distribution systems. Nor do they account for engineering design challenges involved in interconnecting DERs to the distribution system, which the Companies explained in the Commission's PowerForward initiative. Proper system design is needed in order to protect the safety of customers and employees, and the integrity of the distribution system.

Because PJM's changes do not account for distribution system design, they cannot adequately account for safety and reliability. Improper interconnection of DER to the distribution system poses a risk to safety and reliability. Safety and reliability are the Companies' highest priorities and permeate everything the Companies do—every training session, engineering design, construction standard, and operating parameter. The Companies, therefore, urge the Commission to maintain rules that empower electric distribution utilities to ensure that generation is

interconnected to the distribution system in ways that do not interfere with their ability to provide safe and reliable service to their customers.

As noted below in response to Staff Question (B), PJM has advocated for adoption of IEEE 1547-2018 ride through standards in interconnection rules at FERC and with State Commissions. The Commission should reject any suggestions to shift control of interconnections to the distribution system away from the Companies and other local utilities. One size does not fit all. Because utilities are the experts on their own systems, it would be a mistake to move the locus of control from local utilities and this Commission to regional or national commercial market interests. PJM's market models do not include factors for distribution system safety and reliability, and whereas the Companies are directly answerable to this Commission, the developers and consultants for DERs are not.

Indeed, any arguments that the greater good is served by uniformity, or a mandated approach of "one-size-fits-all," are dangerously misplaced, as are any arguments that utilities should not be allowed to impose standards or requirements that exceed the minimum guidance from various national institutions. Such arguments risk driving safety and reliability to the lowest common denominator instead of toward improvement through innovation by those closest to the challenges.

B. Answers to Staff Questions

(a) Staff has specifically drawn on IEEE Std. 1547-2018 in several definitions within the rules without fully adopting the standard due to compatibility lag between IEEE and Underwriters' Laboratories standards. What is the best method for adopting IEEE 1547-2018 in Ohio?

The Ohio Administrative Code does not specify a specific version of IEEE 1547 or UL 1741, so there are no Code changes necessary. The Companies recommend that the interconnection rules not lock in 2018 or any other specific or latest version. Neither the

Companies nor inverter-based DERs currently can comply with IEEE 1547-2018 because compliant inverters do not exist yet. Notably, the Underwriters' Laboratories must finalize its testing standards. Until such time, neither the Companies nor Applicants would be able to comply with a rule that adopts IEEE 1547-2018 in Ohio. Only the electric distribution utilities have the full knowledge and visibility needed to best manage and engineer their distribution systems, taking into account their respective unique circumstances and historic system construction. It is best to leave these requirements at a high level and let the utility engineers who are accountable for safety and reliability determine when the optimal time is for adopting the full IEEE 1547-2018 standards—or for that matter any future version of IEEE 1547.

(b) Relatedly, at the September 11, 2018 workshop, PJM Interconnection LLC (PJM) emphasized the importance of the ride-through requirements and encouraged the Commission to specifically adopt IEEE 1547-2018 and its ride through provisions during this five-year review. Do stakeholders believe that the IEEE 1547-2018 ride-through provisions must be incorporated into Ohio Adm. Code Chapter 4901:1-22 at this time? If so, which category of ride-through requirements should be adopted in these rules and why?

Ride-through represents the time that a DER continues to put power onto the grid after an abnormal condition is detected on the distribution system. IEEE 1547-2018 specifies that DER interconnections "shall" ride-through detection of some abnormal conditions. This is a dramatic change from prior versions of IEEE 1547. Under the 2003 version of IEEE 1547, DER inverters were required to cut off or "trip" within two seconds for "anti-islanding" purposes. The 2014 version of IEEE 1547 provided that DER interconnections "may" ride through by continuing to provide power for a period longer than two seconds; however, to protect the safe and reliable operation of their systems, the Companies maintained the two-second requirement. The 2018 changes in IEEE 1547 are contrary to the historic system design and installation of protection devices throughout the Companies' distribution systems.

There are several other good reasons for reconsider adoption of specific ride-through provisions of IEEE 1547-2018 at the next 5-year rule review. Ride-through may jeopardize safety, reliability, and the operation of distribution assets. The Companies and other EDUs should be allowed to specify ride-through provisions within the limits reflected in IEEE 1547-2018 as they feel necessary to ensure the safe, secure, and reliable operation of their respective distribution systems.

Also, the ride-through issue is still being decided industry-wide. The Companies participate in a DER Ride Through Task Force with PJM and other utilities, where the issue has been tabled without a final resolution. Further, this issue was discussed in the PowerForward Distribution System Planning Workgroup, which likewise decided not to recommend mandating any ride-through set points at this time.[4]

In addition to the lack of industry consensus, the Companies presently do not have a system or any means in which to manage or control customer-owned inverter settings that would enable ride-through without disrupting the Companies' existing protection and reliability equipment. Nor are today's inverters able to detect whether the source of the abnormal condition is a result of a transmission event or a distribution event. Without that determination, ride-through can exacerbate the condition or work at odds with the best solution. Until smart grid deployment reaches a sufficient implementation threshold, the Companies would be faced with reprogramming or replacing their reclosers and circuit breakers to match the full IEEE 1547-2018 ride-through provisions. Although the Companies have reviewed the PJM recommendations for Category III ride-through and plans to operate accordingly, it is inappropriate to adopt the entire ride-through provisions.

[4] See EnerNex report, Distribution System Planning Workgroup, page 30, and page 31 second recommendation.

(c) PJM also encouraged the Commission to use this rule review proceeding to provide clarity regarding whether a request for interconnection is subject to Ohio or PJM jurisdiction. Is such clarification necessary at this time?

Clarification between federal[5] and state jurisdiction is unnecessary. Existing federal laws and regulations—including the Federal Power Act and PURPA, FERC opinions and rulemakings, and PJM tariffs—establish whether an interconnection is under federal or state jurisdiction. Attached to these comments as Exhibit A is a flowchart the Companies developed to illustrate that jurisdictional determination.

However, as the Companies have explained in Comments to FERC, even when interconnection to a distribution system is subject to federal jurisdiction, adherence to the local EDU's standards is required.[6] While federal jurisdiction affects the kind of agreements that must be entered between parties, along with other regulatory requirements, the applicability of PJM standards creates an additional layer of standards, not a displacement of the local EDU's standards. PJM's focus is not on distribution standards, and therefore its requirements are neither redundant of, nor an adequate replacement for, the EDU standards. PJM does not have the authority to overrule the safety and reliability concerns of EDUs. If the Commission were to allow PJM to dictate interconnection standards, it will effectively be yielding its statutory obligation to assure safe and reliable distribution service.

(d) With respect to Ohio Adm. Code 4901:1-22-03, are there any additional standards and codes that have become relevant to the interconnection and interoperability of DERs?

Although the Companies recommend that no specific version of IEEE-1547 be mandated, the Commission should consider rule amendments that require upgrade and/or replacement of

[5] Although the question is framed as "PJM jurisdiction," the Companies note that PJM is authorized to coordinate transmission grid operations, but the entity with jurisdiction is the federal government exercised through FERC.
[6] *Id*., at p.5 ("State jurisdictional authority over distribution level resources must continue to be preserved as the [FERC] develops DER aggregation policies.")

previously approved DER equipment. In addition to the new standards, the manner in which DERs are aggregated and operated or dispatched may soon be very different than that which the Companies previously studied and approved for interconnection. These rule amendments must allow the Companies to evaluate new operating characteristics, in compliance with new versions of IEEE 1574 and anticipated new modes of operation, and as may be required for the safe, secure, and reliable operation of the distribution system. The Companies propose such amendments in Section C below.

(e) During the workshop, two stakeholder groups expressed concerns about engineering challenges posed by DER interconnection within the state. Do these interconnection rules make technical sense from an engineering perspective? Do the rules strike an adequate balance between encouraging the state-wide proliferation of DER while maintaining safety and reliability of the distribution system on a local level? If not, how should the rules be changed and why?

The engineering challenges and interconnection rules exist to protect public safety and reliability of the distribution system. Every DER that is installed and operated in parallel with the Companies' distribution systems has the potential to increase risk to safety and reliability. These risks demand the Companies' due diligence in evaluating interconnection applications. There should be no intentional balancing between encouraging state-wide proliferation of DER and safety and reliability. Safety and reliability should stand alone as the top priority above all else. Evaluating each application on a case-by-case basis using IEEE 1547/UL 1741 equipment provides the level of safety and reliability needed for the safe and secure operation of the distribution system. As noted above, if DERs become aggregated, utilities should have the ability to study the operational impacts of aggregation to determine any detrimental effects and associated distribution system operational requirements and to enforce those requirements. Moreover, the Companies must be allowed to fully and timely recover any costs associated with the implementing the proposed rule amendments, including costs to accommodate change in mode of operations.

(f) Are the generation and capacity limits included in the level 1 and level 2 approval criteria still appropriate? Are EDUs denying applications for level 1 or level 2 interconnection based on applicants exceeding these limits?

As noted above, the Companies recommend that the generation and capacity limits take into account evaluating the impacts of aggregated operation.

(g) Please provide feedback with regard to the efficacy of the administrative procedures and processes set forth in the rules with regard to creating a uniform experience for consumers throughout the state. For example, is the application process adequately standardized? Are applications being processed in a reasonably timely manner considering the complexity of review and necessity for various screens and studies, or are there unreasonable delays to achieving a fully operational status? Are costs adequately addressed?

The Companies believe their current application process represents an efficient approach to gathering the necessary information for proper application screening and review. However, the Companies recommend that costs incurred to re-study system impacts after a DER's change in equipment or mode of operation should be assessed to the DER. Moreover, the Companies must be allowed to fully and timely recover any costs associated with the implementing the proposed rule amendments, including costs to accommodate the aggregation of DERs.

(h) Finally, given that the rules are technically nuanced, should the Commission form a working group including various stakeholders to aid in the continued development of these rules, both now and through future review?

The Companies support the creation of a Commission-endorsed working group comprised of EDU and Staff representatives to further the development of DER interconnection rules that encourage the development of DER interconnections in a safe, secure manner that support the electric distribution utilities' continued reliable and efficient operation of the distribution system.

C. The Companies' Proposed Amendments

As mentioned above, the Companies propose rule amendments that allow them to specify new operating characteristics, in compliance with new versions of IEEE 1574 and anticipated new

modes of operation, and as may be required for the safe, secure, and reliable operation of the distribution system:

(a) The Companies propose that a new definition for the term "Energy Storage technology" be added to define batteries (accompanied by appropriate renumbering of the remaining definitions):

> **"**Energy storage technology**"** means infrastructure that allows for the energy absorption and release of electrical energy into the electric grid.

(b) In 4901:1-22-04 (D) et al, as discussed above, the Companies recommend the DER's proposed mode of operation be added to passages describing the criteria for applications:

> (3) The appropriate criteria and interconnection parameters for the customer's technology and mode of operation, so as not to impose technical and economic barriers to new technology or the development, installation, and interconnection of an applicant's facilities, pursuant to division (A) of section 4928.11 of the Revised Code.

Similarly, the DER's proposed mode of operation should be included in the scope of the EDU's study for impacts to the safety and reliability of the distributions system that require construction or system upgrades, in Subsection (G):

> (1) Where construction or system upgrades of the EDU's system are required by the applicant's installation and operation of a ~~distributed generation~~DER facility, the EDU shall provide the applicant with an estimate of the timetable and the applicant's cost for the construction or system upgrades, consistent with the provisions of this chapter.

Also, in 4901:1-22-05 Application requirements for interconnection, subsection (B)(1), the Companies recommend adding a new section (e) in order to acknowledge that alternative modes of operation are available to DER and to provide the utility with opportunity to re-study the impacts to the distribution system when the operating modes are changed:

> (c) A description of the planned mode of operations, including but not limited to, stand-alone or aggregated operation, provision of ancillary services through wholesale markets, and any changes in equipment or

operations from that previously reviewed and approved by the electric distribution utility.

(c) 4901:1-22-07 Level 2 review: in subsection (E)(1)(a), the Companies propose changing the term "battery" to "energy storage resource" to better match the overall use of terms in these rules:

(i) The type of generation used by the proposed ~~distributed generation facility~~ DER will be taken into account when calculating, estimating, or determining the circuit or line section minimum load. For the application of a solar photovoltaic generation system with no ~~battery~~ energy storage technology, use daytime minimum load, and use absolute minimum load for other generation.

(d) 4901:1-22-10 Uniform requirements for interconnection agreements: the Companies propose adding a new subsection (D), with appropriate renumbering of the other subsections, to require a description of the expected mode of operation for new agreements, and to require updates or amendments to existing agreements to reflect changes from previously executed interconnection agreements:

(D) The applicant shall provide a description of the expected mode of operation for all new agreements, and also shall provide the electric distribution utility with an update for any change in mode of operation from that previously reflected in an existing interconnection agreement. Changes in mode of operation under existing agreements may require a new agreement or an amendment to the existing agreement as determined by the electric distribution utility.

As noted above, these changes are necessary to prevent aggregation and new operating characteristics from disrupting the safety and reliability of the distribution system, including service to other customers.

(e) In original subsection (H)(1), the Companies again propose that the word "batteries" be changed to "energy storage resources" consistent with the new definition and other recommendations proposed by the Companies:

(1) Any periodic tests of the interconnection equipment (including any relays, interrupting devices, control schemes, and ~~batteries~~ energy storage technologies that involve protection of the EDU's system) as recommended by the applicant's equipment manufacturer or required by ~~the institute of electrical and electronics engineers (~~IEEE~~)~~ Std 1547 ~~standards~~, effective as set forth in rule 4901:1-22-03 of the Administrative Code, shall be the responsibility of the applicant.

III. CONCLUSION

The Companies appreciate this opportunity to comment on Staff's proposed amendments and to respond to questions regarding important developing issues in DER. The Companies are uniquely positioned in their responsibility and accountability for the safe and reliable operation of their electric distribution systems in accordance with the Commission's mission and the full array of Ohio laws, regulations, and policy objectives. The Companies look forward to maintaining and improving distribution system integrity through appropriate interconnections rules and standards in conjunction with investment in enhanced, modern distribution management. The Companies respectfully request the Commission consider and approve these recommendations for amendment of the interconnection rules.

Respectfully submitted

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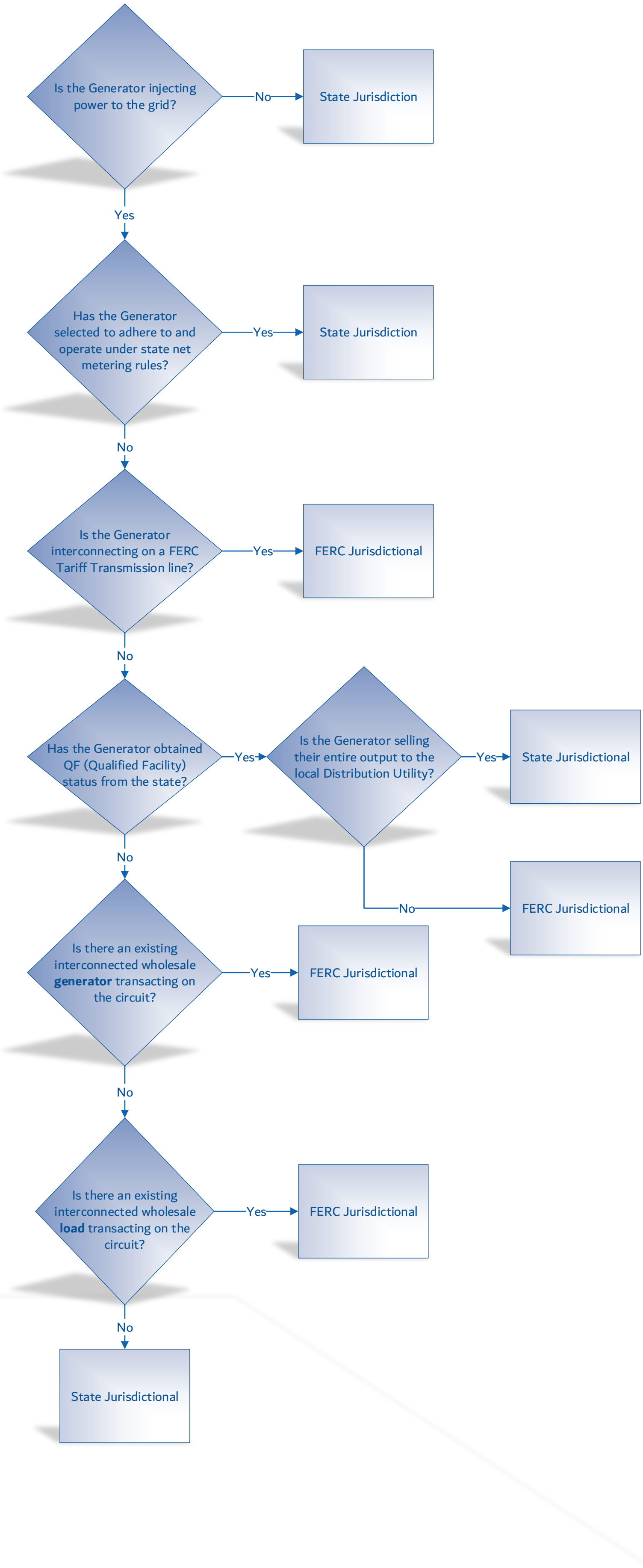
Generator Jurisdiction Determination



CERTIFICATE OF SERVICE

On March 13, 2020, the foregoing document was filed with the Public Utilities Commission of Ohio's Docketing Information System. The PUCO's e-filing system will electronically serve notice of the filing of this document.

/s/ *Robert M. Endris*
One of the Attorneys for Ohio Edison Company, The Cleveland Electric Illuminating Company and The Toledo Edison Company

Summary: Comments Comments of Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company electronically filed by Mr Robert M Endris on behalf of Ohio Edison Company and The Cleveland Electric Illuminating Company and The Toledo Edison Company