INTERCONNECTION STANDARDS

1. Scope and Applicability.

1.1. These standards establish interconnection requirements for Distributed Resources (DR) units up to 2 MW in nameplate capacity, operating in parallel with the Electric Distribution System, that are not required to execute an interconnection agreement with PJM Interconnect (PJM). However, nothing in these procedures shall prevent PJM from subsequently requiring an Interconnection Customer to enter into a separate Interconnection Agreement with PJM if the Small Generator Facility subsequently starts participating in a PJM market or otherwise falls under the scope of PJM Interconnection requirements. Small Generator Facilities that are not designed to operate in parallel are not subject to these procedures. These standards apply to all electric utilities in West Virginia.

1.2. There are two (2) levels, or categories, for the application, review, and approval of DR interconnections:

1.2.1. Level 1 — Small Generator Facilities with Electric Nameplate Capacities of 25 kW or less, are inverter-based and certified.

1.2.2. Level 2 — Small Generator Facilities with Electric Nameplate Capacities of 2 MW or less that do not qualify under Level 1.

2. Definitions.

2.1. Unless the context clearly requires a different meaning, as read herein:

Adverse system impact — shall mean the negative effects due to technical or operational limits on conductors or equipment being exceeded that may compromise the safety, power quality, and reliability of the Electric Distribution System.

Applicant — shall mean a person who has submitted an Interconnection Request to interconnect a Small Generator Facility to a Utility's Electric Distribution System, sometimes also referred to as the "Interconnection Customer."

Area network — shall mean a type of electric distribution system served by multiple transformers interconnected in an electrical network circuit, which is generally used in large metropolitan areas that are densely populated, in order to provide high reliability of service. This term has the same meaning as the term "distribution secondary grid network" as stated in Institute of Electrical and Electronics Engineers (IEEE) standard 1547 Section 4.1.4 (published July 2003), as amended and supplemented.

Business day — shall mean Monday through Friday, excluding Federal or State Holidays.

Calendar day — shall mean any day including Saturday, Sunday or Federal or State Holidays.

Certificate of completion — shall mean the certificate in the form provided in Appendix D.

Certified — shall mean the equipment that satisfies the requirements of Appendix C.

Commission — shall mean the Public Service Commission of West Virginia.

Distribution upgrades — shall mean the required additions and modifications to the Utility's Electric Distribution System on the supply side of the Point of Interconnection. Distribution Upgrades do not include the Applicant's Interconnection Facilities.

Electric nameplate capacity — shall mean the net maximum or net instantaneous peak electric output capability measured in either watts or volt-amps of a Small Generator Facility as designated by the manufacturer.

Utility — shall mean the electric utility entity that owns the Electric Distribution System serving the DR.

Electric Distribution System — shall mean the facilities and equipment used to transmit electricity to ultimate usage points such as homes and industries from interchanges with higher voltage transmission networks that transport bulk power over longer distances. The voltage levels at which Electric Distribution Systems operate differ among areas but generally carry less than 69 kilovolts of electricity. Electric Distribution System has the same meaning as the term Area EPS defined in 3.1.6.1 of IEEE 1547.

Fault Current — shall mean the electrical current that flows through a circuit during an electrical fault condition. A fault condition occurs when one or more electrical conductors contact ground and/or each other. Types of faults include phase to ground, double-phase to ground, three-phase to ground, phase-to-phase, and three-phase. A Fault Current is several times larger in magnitude than the current that normally flows through a circuit.

IEEE 1547 — shall mean the most current official published version of IEEE 1547 "Standard for Interconnecting Distributed Resources with Electric Power Systems" at the time the Interconnection Request is submitted.

IEEE 1547.1 — shall mean the most current official published version of IEEE 1547 "Standard Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems" at the time the Interconnection Request is submitted.

Interconnection Agreement — shall mean an agreement between an Interconnection Customer and a Utility, which in addition to these procedures governs the connection of the Small Generator Facility to the Electric Distribution System, as well as the ongoing operation of the Small Generator Facility after it is connected to the system.

Interconnection Customer — shall mean any entity that proposes to interconnect a Small Generator Facility to an Electric Distribution System.

Interconnection Equipment — shall mean a group of components or integrated system connecting an electric generator with an Electric Distribution System that includes all interface equipment including switchgear, protective devices, inverters, or other interface devices. Interconnection Equipment may be installed as part of an integrated equipment package that includes a generator or other electric source.

Interconnection Facilities — shall mean facilities and equipment required by the Utility to interconnect the Small Generator Facility and the Interconnection Customer's Interconnection Equipment to the Electric Distribution System. Collectively, Interconnection Facilities include all facilities and equipment between the Small Generator Facility and the Point of Common Coupling, including any modification, additions or Distribution Upgrades that are necessary to physically and electrically interconnect the Small Generator Facility to the Utility's Electric Distribution System. Interconnection Facilities are sole use facilities and shall not include Distribution Upgrades.

Interconnection Request — shall mean an Interconnection Customer's request, in the form of Appendix A or B of these Interconnection Standards to interconnect a new Small Generator Facility, or to increase the capacity of, or operating characteristics of an existing Small Generator Facility that is interconnected with the Utility's Electric Distribution System.

Line section — shall mean that portion of a Utility's distribution system connected to an Interconnection Customer, bounded by automatic sectionalizing devices or the end of the distribution line.

Minor equipment modification — shall mean minor changes to the proposed Small Generator Facility that do not have a material impact on safety or reliability of the Electric Distribution System.

Nationally Recognized Testing Laboratory (NRTL) — shall mean a qualified private organization that meets the requirements of OSHA regulations. NRTLs perform independent safety testing and product certification. Each NRTL must meet the requirements as set forth by OSHA in the NRTL program.

Parallel operation — shall mean a Small Generator Facility that connects electrically to the Electric Distribution System and the potential exists for electricity to flow from the Small Generator Facility to the Electric Distribution System. This may be contrasted with a stand-alone generator that operates isolated from the Electric Distribution System.

Point of Common Coupling (PCC) — shall mean the point where the Customer's Interconnection Equipment connects to the Electric Distribution System at which harmonic limits or other operational characteristics such as IEEE 1547 requirements are applied.

Point of Interconnection (POI) — shall mean the point where the Interconnection Equipment connects to the Electric Distribution System.

PJM Interconnection LLC (PJM) — shall mean FERC-approved regional transmission organization that operates the electric transmission system.

PJM Small Generator Technical Requirements and Standards — shall mean the most current version of PJM's interconnection technical requirements applicable to small generators 10 MVA or smaller.

Queue position — shall mean the order of a valid Interconnection Request, relative to all other pending valid Interconnection Requests, that is established based upon the date and time of receipt of the valid Interconnection Request by the Utility. An Interconnection Request shall not be deemed to be invalid by virtue of its being finally evaluated under different procedures from those under which it was originally considered, e.g., an Interconnection Request originally submitted as a Level 1 Interconnection Request but eventually evaluated under Level 2 procedures is still a valid interconnection request and is to be assigned a Queue Position based on the date of its original submission as a Level 1 Interconnection Request.

Scoping meeting — shall mean the meeting between representatives of the Interconnection Customer and the Utility conducted for the purpose of discussing alternative interconnection options, to exchange information including any Electric Distribution System data and earlier study evaluations that would be reasonably expected to impact such interconnection options, to analyze such information, and to determine the potential feasible Points of Interconnection.

Small Generator Facility — shall mean the equipment used by an Interconnection Customer to generate or store electricity that operates in parallel with the Electric Distribution System. A Small Generator Facility has an Electric Nameplate Capacity rating of 2 MW or less and typically includes an electric generator, prime mover, and the Interconnection Equipment required to safely interconnect with the Electric Distribution System.

Spot Network — shall have the same meaning assigned to the term under IEEE Standard 1547 Section 4.1.4, as amended and supplemented. A Spot Network is generally used to supply power to a single customer or a small group of customers.

Standard Small Generator Interconnection Agreement — shall mean the form of Interconnection Agreement applicable to Level 1 Interconnection Request as provided in Appendix A, or Level 2 Interconnection Request as provided in Appendix B. These agreements shall apply to all Small Generator Facilities as described herein.

UL 1741 — shall mean Underwriters Laboratories (UL) Standard "Inverters, Converters, and Controllers for Use in Independent Power Systems."

Conformance — shall mean the interconnection installation evaluation required by IEEE 1547 Section 5.3 and the commissioning test required by IEEE 1547 Section 5.4. For interconnection equipment that has not been Certified, the Conformance Test shall also include the on-site design tests as required by IEEE 1547 Section 5.1 and witnessing by the Utility of production tests required by IEEE 1547 Section 5.2. All tests witnessed by the Utility are to be performed in accordance with IEEE 1547.1.

3. General Provisions.

3.1. Interconnection Requests. The Interconnection Customer desiring to interconnect a Small Generator Facility shall submit an Interconnection Request to the Utility. Interconnection Requests are to be made using the standardized forms contained in Appendix A for Level 1 applications, and Appendix B for Level 2 applications. All utilities shall accommodate the filing of Interconnection Requests electronically.

3.2. Utility Designated Point of Contact. The Utility shall designate an employee or office from which information on the interconnection of Small Generator Facilities can be obtained through informal requests by prospective Interconnection Customers. The level of information to be made available to the prospective Interconnection Customer should include, but not necessarily be limited to, information on the affected Electric Distribution System or portion thereof including any relevant system studies or interconnection studies to the extent that such provision does not violate confidentiality provisions or critical infrastructure requirements.

3.3. Technical Standard. The most current version of IEEE 1547 "Standard for Interconnecting Distributed Resources with Electric Power Systems" will be adopted as the technical standard for the interconnection of Small Generator Facilities in the State.

3.4. Modification of the Application. Any modification to machine data or equipment configuration or to the interconnection site of the Small Generator Facility not agreed to in writing by the Utility and the Interconnection Customer may be deemed a withdrawal of the Application and may require submission of a new Application, unless proper notification of each party by the other and a reasonable time to cure the problems created by the changes are undertaken.

3.5. Site Control. Documentation of site control must be submitted for Small Generator Facility additions with the Complete Application. Site control may be demonstrated through:

3.5.1. Ownership of, a leasehold interest in, or a right to develop a site for the purpose of constructing a Small Generator Facility.

3.5.2. An option to purchase or acquire a leasehold site for such purpose.

3.5.3. An exclusive or other business relationship between Small Generator Facility and the entity having the right to sell, lease or grant the Small Generator Facility the right to possess or occupy a site for such purpose.

3.6. Dispute Resolution. Each Party shall make every reasonable attempt to resolve disputes in a prompt, equitable, good faith manner. Where possible, dispute resolution will be conducted in an informal, expeditious manner in order to reach resolution with minimal costs and delay. If the parties fail to settle their dispute, either party may make a filing with the Commission for adjudication of the dispute (e.g., file a complaint).

3.7. If the Interconnection Request is for a Small Generator Facility that includes multiple energy production devices at a site for which the Interconnection Customer seeks a single Point of Interconnection, the Interconnection Request shall be evaluated on the basis of the aggregate Electric Nameplate Capacity of multiple devices.

3.8. If the Interconnection Request is for an increase in capacity for an existing Small Generator Facility, the Interconnection Request shall be evaluated on the basis of the new total Electric Nameplate Capacity of the Small Generator Facility.

3.9. The Utility shall maintain records of all Interconnection Requests received, the times required to complete Interconnection Request approvals and disapprovals, and any justification for the actions taken on the Interconnection Requests. The Utility shall keep such records on file for a minimum of three years.

3.10. Once an Interconnection Request is deemed complete by the Utility, any modification other than a Minor Equipment Modification to the proposed Small Generator Facility or Interconnection Equipment, or Minor Equipment Modification that would not affect the application of the screens in Levels 1 or 2, and that is not agreed to in writing by the Utility, shall require submission of a new Interconnection Request.

3.11. To minimize costs, the Utility may propose to interconnect more than one Small Generator Facility of a single customer at a single Point of Interconnection provided such interconnection is supportable by the customer's facilities. A request for such interconnection shall not be unreasonably refused. An Interconnection Customer, however, may elect to pay the entire cost of a separate Interconnection Facility.

3.12. Maintenance and Testing. Each Interconnection Customer shall conduct periodic maintenance and testing of its Small Generator Facility in accordance with the provisions of IEEE 1547 relating to maintenance and testing.

4. Interconnection Request, Review, and Approval Procedures.

4.1. Level 1 Interconnections.

4.1.1. Application. All Level 1 Small Generator Facilities shall use the standard Interconnection Request Form contained in Appendix A.

4.1.2. Application Fees. A maximum fee of thirty dollars ($30) shall be charged for all Level 1 applications.

4.1.3. Each Utility shall adopt a Level 1 interconnection review procedure as set forth in Section 4.1.6. herein for all Small Generator Facilities that meet the screening criteria in Section 3.6. A Utility shall not impose additional requirements not specifically authorized under this Section.

4.1.4. Level 1 Screening Criteria. For interconnection of a proposed Small Generator Facility the Utility shall utilize the Level 1 procedure set forth in 4.1.6. if the Small Generator Facility meets the following criteria:

a. The Small Generator Facility utilizes inverter-based technology and customer Interconnection Equipment that is non-islanding, UL listed, and Certified in accordance with the provisions contained in Appendix C.

b. The Small Generator Facility has an Electric Nameplate Capacity of 25 kW or less and is proposing to interconnect to distribution facilities operating at 69 kV or less.

c. The interconnection will not cause the aggregated generation on the radial distribution circuit including the proposed generator to exceed fifteen percent (15%) of the Line Section annual peak, three-phase load or five percent (5%) of the Line Section annual peak, single-phase load as measured at the substation. Should the generator fail this screening criterion, the Utility shall proceed with interconnection if it determines that the generator can still be interconnected in a safe, reliable manner.

d. For interconnection to the load side of Spot Network protectors, the aggregated generation including the proposed generator must not exceed five percent (5%) of a Spot Network's maximum load.

e. If the proposed Small Generator Facility is to be interconnected on a single-phase shared secondary, the aggregate generation capacity on the shared secondary, including the proposed Small Generator Facility, will not exceed 25 kW.

f. If the proposed Small Generator Facility is single-phase and is to be interconnected on a center tap neutral of a 240 volt service, its addition shall not create an imbalance between the two sides of the 240 volt service of more than twenty percent (20%) of the nameplate rating of the service transformer.

4.1.5. Level 1 Review Procedure.

a. Upon receipt of a standard Level 1 Interconnection Request provided in Appendix A the Utility shall within ten (10) business days inform the Applicant that the Interconnection Request is either complete or incomplete, and if incomplete provide a list of the missing items.

b. In the event the Utility does not have a record of receipt of the Interconnection Request, the Applicant will provide the Utility with an additional copy of the Interconnection Request. If the Applicant can demonstrate by return mail receipt that the original Interconnection Request was delivered to the Utility, the Utility shall be required to forgo the initial ten-day (10-day) response period and immediately complete their evaluation of the Interconnection Request within three (3) business days of receipt of the Applicant's resubmittal.

c. Utility Verification. The Utility verifies Small Generator Facility equipment can be interconnected safely and reliably using Level 1 screens set forth in Section 4.1.4. This can take up to fifteen (15) business days after receipt of a complete Interconnection Request.

d. Certificate of Completion. Before service is provided by the Utility, the Interconnection Customer shall submit a Certificate of Completion as provided in Appendix D to the Interconnection Standards.

e. Conformance Test. The Interconnection Customer shall provide the completed Certificate of Completion, three executed copies of the Interconnection Agreement and the proposed schedule and plan for completing the tests required by IEEE 1547 to the Utility. Within ten (10) business days following the receipt of the above items by the Utility or within the time limits agreed to by the Parties, the Interconnection Customer shall complete all testing required by IEEE 1547. The Utility may choose to be present at the Small Generator Facility during the testing of the proposed interconnection. The Interconnection Customer shall provide the test results to the Utility. If the Utility identifies problems with the inspection, if the test results are unsatisfactory, or if the Utility does not agree with the customer's periodic test procedures, the Utility will notify the customer in writing within ten (10) business days with the deficiencies clearly identified. The Utility may withhold authorization for parallel operation until such deficiencies have been properly corrected.

f. The Small Generator Facility shall obtain approval by all local or municipal electric code officials with jurisdiction over the interconnection.

4.1.6. Unless the Utility can demonstrate that the Small Generator Facility cannot be interconnected safely and reliably, the Utility shall execute the standard Level 1 Interconnection Agreement as provided in Appendix E.

4.1.7. Isolation Device. Unless otherwise prohibited by state regulation and if required by Utility operating practices, all Level 1 Small Generator Facilities shall be capable of being isolated from the Utility by means of a lockable, visible-break isolation device readily accessible by the Utility. Unless a readily accessible load break device is otherwise provided in the interconnection system, the isolation device shall be capable of interrupting load. The isolation device shall be installed, owned, and maintained by the owner of the Small Generator Facility and located between the Small Generator Facility and the Point of Interconnection. A draw-out type circuit breaker with the provision for padlocking at the draw-out position qualifies as an isolation device for purposes of this requirement. The outdoor disconnector shall be within sight and within ten (10) feet of meter socket and no more than five (5) feet above ground level. Alternatively, the Interconnection Customer, at its option, may elect to provide the Utility access to an isolation device that is contained in a building or area that may be

unoccupied and locked or not otherwise readily accessible to the Utility, by providing a lockbox capable of accepting a lock provided by the Utility that will provide ready access to the isolation device. Where a lockbox is required, the Interconnection Customer shall install the lockbox in a location that is readily accessible by the Utility and the Interconnection Customer shall affix a placard in a location acceptable to the Utility that provides clear instructions to its operating personnel on how to gain access to the isolation device. Because this standard will affect existing Interconnection Customers, the Interconnection Customer shall have six (6) months from the date the Interconnection Customer's electric utility provider provides notice of the enactment of the Rules Governing Electric Utility Net Metering Arrangements and Interconnections, 150 C.S.R. 33 (effective November 15, 2019 to comply with this standard).

4.1.8. If the Small Generator Facility is not approved under a Level 1 review, the Interconnection Customer may submit a new Interconnection Request for consideration under Level 2 procedures specified herein without sacrificing the original Queue Position.

4.2. Level 2 Interconnections.

4.2.1. Application. Level 1 Small Generator Facilities that were not approved under a Level 1 review and all Level 2 Small Generator Facilities shall use the standard Interconnection Request Form contained in Appendix B.

4.2.2. Application Fees. A maximum fee of fifty dollars ($50) plus one dollar ($1) per kW of capacity shall be charged for all Level 2 applications.

4.2.3. Each Utility shall adopt a Level 2 interconnection review procedure as set forth in Section 4.2.5. for all Small Generator Facilities that meet the screening criteria in Section 3.6. A utility shall not impose additional requirements not specifically authorized under this Section.

4.2.4. Level 2 Screening Criteria. For interconnection of a proposed Small Generator Facility the Utility shall utilize the procedures set forth in 4.2.5 if the Small Generator Facility meets all of the following screening criteria:

a. The Small Generator Facility has an Electric Nameplate Capacity of 2 MW or less, is Certified in accordance with the provisions contained in Appendix C, does not qualify under the requirements for a Level 1 interconnection, and is proposing to interconnect to distribution facilities operating at 69 kV or less, provided that an industrial customer that is served at a higher transmission level may meet this criteria.

b. The interconnection will not cause the aggregated generation on the radial distribution circuit including the proposed generator to exceed fifteen percent (15%) of the Line Section annual peak, three-phase load or five percent (5%) of the Line Section annual peak, single-phase load as measured at the substation. If the generator fails this screening criterion, the Utility shall proceed with interconnection if it determines that the generator can still be interconnected in a safe, reliable manner.

c. For interconnection to the load side of Spot Network protectors, the aggregated generation including the proposed generator must not exceed five percent (5%) of a Spot Network's maximum load.

d. The aggregated generation on the radial distribution circuit including the proposed generator will not contribute more than ten percent (10%) to the distribution circuit's maximum fault current at the point on the high voltage (primary) level nearest the proposed point of common coupling.

e. The proposed Small Generating Facility, in aggregate with other generation on the distribution circuit, will not cause any distribution protective devices and equipment (including but not limited to substation breakers, fuse cutouts, and line reclosers), or Interconnection Customer equipment on the system to exceed eighty percent (80%) of the short circuit interrupting capability; nor is the interconnection proposed for a circuit that already exceeds eighty percent (80%) of the short circuit interrupting capability.

f. The proposed Small Generating Facility, in aggregate with other generation interconnected to the distribution low voltage side of the substation transformer feeding the distribution circuit where the Small Resource proposes to interconnect, will not exceed 10 MW in an area where there are known or posted transient stability limitations to generating units located in the general electrical vicinity (e.g., 3 or 4 transmission voltage level busses from the point of interconnection).

g. If the proposed Small Generator Facility is to be interconnected on a single-phase shared secondary, the aggregate generation capacity on the shared secondary, including the proposed Small Generator Facility, will not exceed 25 kW.

4.2.5. Level 2 Review Procedure:

a. Upon receipt of a standard Level 2 Interconnection Request provided in Appendix B, the Utility shall within ten (10) business days inform the Applicant that the Interconnection Request is either complete or incomplete, along with a list of the missing items.

b. In the event the Utility does not have a record of receipt of the Interconnection Request, the Applicant shall provide the Utility with an additional copy of the Interconnection Request. If the Applicant can demonstrate by return mail receipt that the original Interconnection Request was delivered to the Utility, the Utility shall be required to forgo the initial ten-day (10-day) response period and immediately complete their evaluation of the Interconnection Request within three (3) business days of receipt of the Applicant's resubmittal.

c. The Utility verifies Small Generator Facility equipment can be interconnected safely and reliably using the Level 2 screens set forth in Section 4.2.4. This can take up to twenty-five (25) business days after receipt of a complete Interconnection Request.

d. Certificate of Completion. Before service is provided by the Utility, the Interconnection Customer shall submit a Certificate of Completion as provided in Appendix D to the Utility.

e. Conformance Test. The interconnection customer shall provide the completed Certificate of Completion, three executed copies of the Interconnection Agreement and the proposed schedule and plan for completing the tests required by IEEE 1547 to the Utility. Within ten (10) business days following the receipt of the above items by the Utility or within the time limits agreed to by the Parties, the Interconnection Customer shall complete all testing required by IEEE 1547. The Utility may choose to be present at the Small Generator Facility during the testing of the proposed interconnection. The Interconnection Customer shall provide the test results to the Utility. If the Utility identifies problems with the inspections, if the test results are unsatisfactory, or if the Utility does not agree with the customer's periodic test procedures, the Utility shall notify the customer in writing within ten (10) business days with the deficiencies clearly identified. The Utility may withhold authorization for parallel operation until such deficiencies have been properly corrected.

f. The Small Generator Facility shall obtain approval by all local or municipal electric code officials with jurisdiction over the interconnection.

4.2.6. Unless the Utility can demonstrate that the Small Generator Facility cannot be interconnected safely and reliably, the Utility shall sign the approval line on the Interconnection Request Form and execute the standard Level 2 Interconnection Agreement as provided in Appendix F.

4.2.7. Isolation Device. Unless otherwise prohibited by state regulation and if required by Utility operating practices, all Level 2 Small Generator Facilities shall be capable of being isolated from the Utility by means of a lockable, visible-break isolation device readily accessible by the Utility. Unless a readily accessible load break device is otherwise provided in the interconnection system, the isolation device shall be capable of interrupting load. The isolation device shall be installed, owned, and maintained by the owner of the Small Generator Facility and located between the Small Generator Facility and the Point of Interconnection. A draw-out type circuit breaker with the provision for padlocking at the draw-out position qualifies as an isolation device for purposes of this requirement. The outdoor disconnector shall be within sight and within ten (10) feet of meter socket and no more than five (5) feet above ground level. Alternatively, the Interconnection Customer, at its option, may elect to provide the Utility access to an isolation device that is contained in a building or area that may be unoccupied and locked or not otherwise readily accessible to the Utility, by providing a lockbox capable of accepting a lock provided by the Utility that will provide ready access to the isolation device. Where a lockbox is required, the Interconnection Customer shall install the lockbox in a location that is readily accessible by the Utility and the Interconnection Customer shall affix a placard in a location acceptable to the Utility that provides clear instructions to its operating personnel on how to gain access to the isolation device.