Shenandoah Valley Electric Cooperative

A Touchstone Energy® Cooperative

Distributed Generation Resource Integration Requirements

SVEC Transmission and Distribution System

Revision Date: August 1, 2017
Revision Number: 1
Last Reviewed: June 1, 2017

Acceptance Signatures

Submitted: _____ Date: 8/1/2017
Jason Burch
Manager of System Engineering

Reviewed: _____ Date: 8-8-2017
Tony Dean
Manager of District Operations

Reviewed: _____ Date: 8/14/2017
Ron Shickel
Manager of Technical Services

Reviewed: _____ Date: 8/8/2017
Ben Cash
Manager of Distribution Systems

Approved: _____ Date: 9/25/17
Greg Rogers
Vice President of Engineering and Operations

Approved: _____ Date: 9-25-17
Michael Hastings
President and Chief Executive Officer

Revision History

Revision Number	Revision Date	Details of Revision	Revision by
0	4/1/2016	Original Document Submittal	Jason Burch
1	8/1/2017	Adjustments for Virginia Administrative Code and SVEC staff changes	Jason Burch

Table of Contents

Introduction

1.0 General Purpose and Topics Addressed

This statement of Shenandoah Valley Electric Cooperative (SVEC) Distributed Resource Integration Requirements addresses the requirements and sets forth the process for interconnection of member-owner and third party generation facilities with SVEC transmission and distribution facilities.

However, these requirements do not replace the need for an accurate and detailed design completed by a licensed and professional engineering consultant that is selected by the Interconnecting Consumer ("IC"). Nor do the requirements for interconnection replace the need for a detailed engineering review by SVEC to ensure protection of its transmission and distribution system.

This document is necessarily more static than the emerging technologies and resulting designs that may be applicable at the time of the contemplated interconnection, on either SVEC's side or the ICs side, or both. Therefore, each specific interconnection request must be analyzed at the time of request using the most current electrical system characteristics and conditions, regulatory requirements, laws, and industry standards.

This document only covers the interconnecting requirements of SVEC. Old Dominion Electric Cooperative (ODEC) is the sole provider of energy to SVEC and Distributed Generation Resource interconnections may be subject to additional requirements beyond those of SVEC. Furthermore, SVEC's electric distribution and transmission lines directly interconnect with facilities of First Energy, Dominion Virginia Power, Rappahannock Electric Cooperative, BARC and Harrisonburg Electric Commission and all interconnections may be subject to additional requirements beyond those of SVEC and ODEC, including, but not limited to, the Virginia Administrative Code, chapter 314 and chapter 315.

Section 2.01 of this document deals with interconnections *with* net metering. Section 2.02 discusses interconnections *without* net metering if the generation capacity is not greater than 20 MW. Section 3 sets forth requirements that apply to all Distributed Generation Resources ("DGR") proposed by the IC regardless of size (but with some differentiation based on size), duration, or mode of interconnection. The Section 3 requirements apply to every IC regardless of the intended use by the IC, including, but not limited to self-generation without net metering, generation with net metering, generation for peak shaving, or generation for sale into the PJM Marketplace.

These SVEC Distributed Generation Resource Interconnection Requirements cites standards, regulations, and other public domain requirements as those exist at the time this document has been last edited. Regardless, the most recent version shall be applicable.

Engineering review by SVEC is for the sole purpose of protecting the SVEC transmission and distribution system from damage or failure due to the DGR interconnected by the IC. The IC shall not rely on the SVEC engineering review, and shall complete its own independent design and review by licensed engineering firms to ensure accurate, safe, and proper operation and protection of its DGR installation. The applicable interconnection agreement shall prevail for matters of IC liability in the event of disoperation or failure of the DGR.

Interconnection Process

2.0 Initiating the Interconnection Process

Application forms, corresponding to the particular applicable operational intent listed later in this document, have been created by the Commonwealth of Virginia. Those forms are included in Appendix A. Prospective ICs interested in interconnecting DGR with the SVEC transmission and distribution system shall complete the appropriate application form for interconnection. Each application contains basic information for the specific site that will allow preliminary discussions with SVEC and will facilitate its review of the request.

The liaison at SVEC for applications as of the date of this document is Jason Burch. His contact information is [(540) 434-2200 and jburch@svec.coop]. He is available to informally discuss interconnection requirements and practices with potential ICs. Applicants should review the SVEC website to determine any change in the liaison.

There are two distinct and different sets of Virginia statutes and corresponding regulations applicable to interconnection situations not exceeding 20 MW of capacity: one for interconnections without net metering, and the other for interconnections involving net metering. The two sets of rules do not overlap; each is distinct to the particular category of interconnection, i.e., with or without net metering. The statutes and regulations for the first category can be accessed at http://law.lis.virginia.gov/vacode/title56/chapter23/section56-578/ and http://law.lis.virginia.gov/admincode/title20/agency5/chapter314/; and the second category at http://law.lis.virginia.gov/vacode/title56/chapter23/section56-594/ and http://law.lis.virginia.gov/admincode/title20/agency5/chapter315/ . By statute, the right of farms to interconnect has been ensured since 2009. During a transition period from July 1, 2017 until July 1, 2019, qualifying small agriculture generating facilities have a choice between two sets of rules for interconnection, with only one set of rules applying after July 1, 2019. The current statutory interconnection rights of farms is found at http://law.lis.virginia.gov/vacode/title56/chapter23/section56-594/ and the two following statutes, §56-594.1 and 594.2. As of the date of this version of SVEC's statement of DGR Integration Requirements, the State Corporation Commission is reportedly developing regulations to implement the transition and the second set of rules. All subsequent references in this document refer only to the requirements for agricultural interconnections under the first set of rules. Interested farmers should contact the SVEC liaison person named above to discuss the two options that may be available.

The applicable regulations contain complete descriptions of the processes. Interconnection either with or without net metering, has attracted a great deal of interest among SVEC member-owners. Industrial member-owners often use consultants who are experienced in the process and already knowledgeable about the requirements. Nonindustrial member-owners usually are relying on equipment vendors for information as well as the results of their own research, generally without prior personal experience. This document highlights portions of the process set out in the regulations in an effort to direct particular attention to those matters that merit the most and earliest attention and to provide an overview of the process of interconnection. With respect to interconnection both with and without net metering, the applicable regulations take precedence over the description of processes set forth herein.

Potential ICs are advised to refer to the applicable regulations after reviewing the material set forth in this document. Nonindustrial member-owners will wish to carefully compare the requirements addressed in this document and the regulations with information provided by equipment vendors, since the latter may not be tailored to Virginia conditions or requirements.

Through the liaison referenced above, SVEC is available to discuss matters of interconnection if a prospective IC desires general information for the purpose of considering the installation and interconnection of a DGR project with the SVEC system. The liaison will also guide the prospective IC through the process once an application has been submitted to SVEC. The basic information contained in the application will allow SVEC to determine the steps necessary for the interconnection process. Interconnection will be evaluated against electric circuit conditions at the requested interconnection point on the SVEC transmission and distribution system. Other considerations include, but are not limited to, neighboring or existing interconnections, known loads within the proximity of the interconnection, and other conditions impacting the electrical characteristics of the SVEC transmission or distribution circuit.

The following pages outline the steps for interconnecting DGR with the SVEC transmission and distribution system.

2.01 Net Metering: Residential, Non-Residential, and Agricultural

The prospective IC should complete and submit a Net Metering Interconnection Notification (NMIN) Application.

- SVEC suggests that the IC submit the NMIN, and request approval for interconnection from SVEC prior to purchasing, leasing or installing any equipment or facilities. This will ensure, prior to the IC purchasing the DGR, that the DGR the IC expects to install will in fact meet SVEC requirements for interconnection.

- An application for DGR interconnected as "agricultural net metering" (please see the definition is this term at 20 VAC 5-315-20) for a farm shall include the following with the IC application for interconnection: specific meters to be aggregated, and proof that the IC is an agricultural business operating at the interconnection location. Proof may be an agribusiness listing, LLC status, or other reasonable evidence of sales of goods or services in agriculture.

SVEC will review the application for the following items:

- Generator output versus historical usage.

- SVEC facilities serving the location.

- Power quality impacts to the local SVEC system. (Please refer to Section 3.0 for a detailed listing of requirements).

- Whether the equipment meets standards: (Please refer to Section 3.03 for a detailed listing of standards).

    - Solar Panels: UL-1703 listed (not a requirement, but advised)
    - Inverter: IEEE-1547 and UL-1741 listed (requirement)
    - Manual disconnect switch mounted within ten (10) feet of meter base (requirement)

- Other Virginia interconnection compliance requirements.

SVEC will coordinate installation of the net-meter(s) at the approved location.

2.02 All Other Distributed Generation Resources Not Greater Than 20 MW:

Step 1 – Evaluation and Interconnection Processes

Level One: Available to an IC with generation capacity not exceeding 500 kW.

- IC Deliverables:
  - A completed Level One Interconnection Request Form.
  - Payment of a non-redundable processing fee of $100.00

- Upon receipt of a complete Level One Interconnection Request Form, SVEC will review the proposed DGR location relative to SVEC facilities. This review will be in accordance with 20VAC5-314-60B and 20VAC5-314-60C (as applicable).

- SVEC Deliverables:
  - Costs associated with modifications to SVEC facilities necessary for interconnection.
  - Deficiencies in design that do not meet interconnecting standards.
  - Improvements to protection schemes (SVEC and/or IC) necessary for Interconnection.
  - A written agreement to define costs, payments, and other matters related to any changes necessary for interconnection. If an agreement is not reached, then the dispute shall be resolved either, at the option of the IC, pursuant to 20VAC5-314-100, or the application shall be processed as a Level Two request.

Level Two: Available to an IC with generation capacity not exceeding 2 MW and which does not qualify for Level 1.

- IC deliverables:
  - a completed Level Two and Three Interconnection Request Form.
  - Payment of a non-refundable processing fee of $500.00

- Upon receipt of a complete Level Two and Three Interconnection Request Form and the processing fee, SVEC will review the proposed DGR location relative to SVEC facilities. This review will be in accordance with 20VAC5-314-60C and 20VAC5-314-60D (as applicable).

- SVEC Deliverables:
  - Statement of IC ability to interconnect.
  - Other directives and procedures pursuant to 20VAC5-314-60E through 20VAC5-314-60J.
    - If necessary SVEC will provide a supplemental review agreement to be executed and returned by the IC along with a deposit equal to the estimated review cost which will be applied to the actual cost of the supplemental review. The IC is responsible for full labor costs (including overhead) associated with the supplemental review as well as any and

all conversations, explanations, or responses required to complete the review. If the project is not realized, the deposit will be compared to the actual cost of supplemental review and debts or refunds settled. If improvements or changes to SVEC systems are necessary, cost estimates will be provided. The IC should carefully review the regulations about payment of a deposit and costs with respect to a supplemental review.

- Written agreement to define costs, payments, and other matters related to any changes necessary for interconnection.

Level Three: Available to any IC if not larger than 20 MW and which does not pass or qualify for the Level One or Level Two processes. The Level Three interconnection process will include a scoping meeting, feasibility study, system impact study, and facilities study, as needed.

Feasibility Study:

If the results of the scoping meeting are favorable to the IC, SVEC will perform a feasibility study of the generation on the electrical facilities of SVEC.

- IC Deliverables:
  - A completed Level Two and Three Interconnection form.
  - A completed Level Two and Three Facilities Study Information form,
  - A fully executed Feasibility Study Agreement.
  - SVEC will not review or comment on partial submittals. If partial submittals occur inadvertently, SVEC will notify IC and wait for all remaining documents to be included and submitted.
  - The IC is responsible for all labor costs (including overhead) associated with the study as well as any and all conversations, explanations, or responses required to complete the study. SVEC requires a cash deposit of the lessor of 50% of estimated feasibility study cost, or $1,000. If the project is not realized or actual costs exceed estimate, SVEC and IC will settle all debts or refunds against actual.

- SVEC Deliverables:
  - Feasibility Study Agreement.
  - Cost estimate for feasibility study.
  - Initial (high level) identification of deficient equipment, grounding schemes, and cost estimates associated interconnection needs.

System Impact Study

If the results of the Feasibility Study are favorable to the IC, SVEC will perform an in-depth System Impact study of the generation on the electrical facilities of SVEC.

- The IC required deliverables include
  - A completed Level Two and Three Interconnection form.

- A completed Level Two and Three Facilities Study Information form.
- A fully executed System Impact Study Agreement.
- SVEC will not review or comment on partial submittals. If partial submittals occur inadvertently, SVEC will notify IC and wait for all remaining documents to be included and submitted.
- IC is responsible for all labor costs (including overhead) associated with the study as well as any and all conversations, explanations, or responses required to complete the study. Due to the depth and breadth of the System Impact Study, SVEC requires a cash deposit of 100% of estimated System Impact study cost. If the project is not realized or actual costs exceed estimate, SVEC and IC will settle all debts or refunds against the deposit.

o SVEC Deliverables:
- System Impact Study Agreement
- Detailed impact to electric system should DGR interconnect without modifications to electric system.
- Thorough analysis of protection schemes and short circuit analysis.
- Voltage drop and flicker studies
- Grounding review
- Impacts to existing equipment
- Cost estimates to remedy any issues

<u>Facilities Study</u>

If the results of the System Impact Study are favorable to the IC, SVEC will perform a facilities study of the generation on the electrical facilities of SVEC.

o IC Deliverables:
- A completed Level Two and Three Interconnection form .
- A completed Level Two and Three Facilities Study Information form.
- A fully executed Facilities Study Agreement.
- A set of engineering drawings showing all facets of interconnection. One-line drawings, relay and protection drawings, grounding protection drawings, physical layout, and sequence of operation are some, but not all, of the appropriate deliverables. This study shall not begin until all information describing the interconnection has been received by SVEC. The submittal of these documents shall be in one packaged submittal. SVEC will not review or comment on partial submittals. If partial submittals occur inadvertently, SVEC will notify IC and wait for all remaining documents to be included and submitted.
- IC is responsible for all labor costs (including overhead) associated with the study as well as any and all conversations, explanations, or responses required to complete the study. Due to the depth and breadth of the System Impact Study, SVEC requires a cash deposit of 100% of estimated Facilities study cost. If project is not realized or actual costs exceed estimate, SVEC and IC will settle all debts or refunds against the deposit.

- SVEC Deliverables:
  - Facilities Study Agreement
  - Commentary, requirements, and changes to IC design necessary for interconnection
  - Cost estimates to remedy any SVEC Distribution system needs to accommodate interconnection.

Step 2 - Interconnection Agreements, Construction, and Testing

Agreements: For Level One interconnections, if the IC complies with the requirements and conditions determined by the studies**,** then the IC and SVEC shall commence the interconnection pursuant to a formal, written agreement. If the IC contends that the requirements and conditions are unreasonable, then at the ICs option, it may either utilize a dispute resolution process described in the regulations at 20VAC5-314-100, or alternatively proceed as a Level Two applicant. For Level One interconnections, the Commonwealth of Virginia does not mandate that a formal Interconnection Agreement exist between the generator and the utility to which the generator interconnections. The standard document, which is called a Small Generator Interconnection Agreement (SGIA), can be found in the regulations. SVEC, through operational experience, has found that a formal written agreement avoids miscommunication and misunderstanding and thus is important for Level One interconnections. For Level Two and Level Three interconnections, the Commonwealth of Virginia requires that a formal Interconnection Agreement exist between the generator and the utility to which the generator interconnects.

- Small Generator Interconnection Agreement (SGIA)
  - The IC and SVEC will work together to assemble the SGIA. This document defines many aspects of the relationship between the IC and the utility. Several of the engineering documents will be attached as appendices to the Agreement. The extent of these necessary appendices are dependent on the interconnecting system. Generally, these include:
    - Sequence of Operation (for each and every mode of operation)
    - Relaying and Protection Drawing
    - Relay settings
    - One-Line drawing

- SVEC will not execute the SGIA until all deficiencies identified in prior studies (Feasibility, System Impact, and Facilities) have been remedied to the satisfaction of SVEC.

- The IC may test any and all systems prior to execution of this SGIA provided the DGR does not make a parallel connection with SVEC's electrical system.

Construction: If system improvements are necessary, SVEC and the IC must reach an agreement on all aspects of the improvements prior to commencement of SVEC construction or other technical activities. SVEC shall pursue construction and installation of facilities with reasonable speed in accordance with VAC-314 subject to material and labor availability. SVEC reserves the right to specify, order, and install any equipment SVEC deems necessary for interconnection of DGR during agreement negotiations. SVEC will not be required to pursue the acquisition of alternate (non-SVEC-standard) equipment in order to satisfy schedules within the SGIA.

Testing: Prior to granting operating privileges, IC-installed DGR shall undergo extensive System Commissioning and Performance Testing (SCPT). After the DGR is fully operational and if conditions or operating instances justify, SVEC may require retesting performance of the DGR.

- Programming and testing of the utility grade relay at the Point of Common Coupling (PCC) are to be implemented and documented by a testing laboratory acceptable to SVEC.

- SVEC reserves the right to observe any and all SCPT demonstrations of protection system relays, limits, or other nuances. Testing of all devices shall be coordinated so as to allow for observation. SVEC requires trip testing of specific relay systems associated with protection of PCC.

- Commissioning of paralleling abilities shall only be allowed after the execution of the SGIA.

- The IC shall provide a signed and certified relay testing document to SVEC showing all relays and protection equipment functioned as designed and specified in the SGIA.

- If the DGR changes from the specifications set forth in the SGIA, SVEC will need to analyze and approve changes against any and all metrics and will require retesting of system; both at the full cost to the IC. If changes are required to the SVEC system, the IC shall be responsible for full cost reimbursement.

- PCC protection must be tested every six (6) years and reported to SVEC. Any unsatisfactory conditions found during periodic testing must be remedied prior to any further operation of generation facilities.

Technical Requirements

3.0 Guidelines and Requirements of Interconnecting Facilities

3.01 SVEC Transmission and Distribution Standards

SVEC's primary distribution system voltages are (nominal) 7.2/12.47 kV, 14.4/24.9 kV, and 19.9/34.5 kV. SVEC's subtransmission system voltage is 19.9/34.5 kV. SVEC operates transmission voltages at 69 kV and 115 kV. These circuits are arranged in a variety of configurations including multi-grounded wye, uni-grounded wye, and delta.

SVEC's protection practices include reclosing on circuits as well as transmission lines. This reclosing can occur in a three-phase simultaneous trip as well as single phase, individual trips all the way to a device lock out. SVEC utilizes reclosing devices for distribution lines and circuit breakers for subtransmission and transmission lines. SVEC will consider changes to existing protection schemes to accommodate DGR, but reserves the right to cancel such measures to avoid the possibility of adverse effects on service continuity and problems to neighboring members. (Any and all allowable changes shall be done at the full cost to the IC.) Changes to a protection scheme are non-negotiable and at the full discretion of SVEC.

SVEC's distribution circuits vary greatly in available capacity, short circuit current, equipment sizing, equipment capabilities, and many other characteristics. These variables create the need for specific and thorough reviews of each interconnection location.

SVEC's substations were designed to meet current standards and codes at the time of construction given the conditions at the time of design with reasonable growth in the future. Therefore, equipment was sized, protected, and arranged in a manner appropriate prior to the proposed DGR. Items such as ground grid, breaker sizing, and protection settings may need to be increased, updated, and improved to allow interconnection of the DGR. Any and all electrical system reconfigurations and/or improvement costs required for interconnection of the DGR shall be paid by the IC.

3.02 SVEC General Requirements

It is the policy of SVEC to allow any member/owner to operate their generation facility in parallel format with the SVEC systems providing this operation can be performed without adverse effects to the public, SVEC systems, or to upstream power providing systems (e.g. transmission facilities). SVEC accepts the interconnection of any and all forms of generation (e.g. solar, wind, hydro, fossil fuels, etc.). Whichever generation source is selected for interconnection, the IC must provide a 60 Hertz, alternating current, sine wave at a voltage compatible with the SVEC at the point of interconnection. Further details are provided later in this document.

The PCC shall be clearly delineated and defined. An overcurrent device rated to interrupt available fault current shall be located at the PCC as well as a manual disconnect device which can be opened and locked open for necessary safety precautions. The manual disconnecting device must have contacts that are visually able to be identified as open as well as provisions for lockout/tagout. This device shall be accessible to SVEC personnel at all times and be labeled as the disconnecting point.

Specifics of the interconnection of the IC shall be dictated by IEEE-1547 – Standard for Interconnecting Distributed Resources with Electric Power systems. The DGR installation and interconnection shall meet all requirements as set forth in IEEE-1547. In addition, the DGR shall also meet all applicable national, state, and local construction and safety codes in addition to all applicable UL, ANSI, and IEEE standards and guidelines.

The DGR shall be interconnected in such a manner as to not disrupt the operational strategies of SVEC and shall be appropriately metered per the current standards as set forth by the State of Virginia.

Requests by the IC to interconnect to SVEC-owned 35 kV, 25 kV or 12 kV distribution system shall use a four wire, multi-grounded neutral distribution circuit to limit possible dangerous overvoltage conditions. Transformers installed by the IC shall be connected in a Grounded Wye-Grounded Wye configuration and shall be approved as step-up transformers by the manufacturer.

SVEC requires that the generation source be effectively grounded per IEEE standards.

The DGR size shall be limited to capacities as identified in Virginia codes governing net metering and small generator interconnection.

Any and all operation of the DGR facilities shall cause no impact, reduction in quality, or other adverse conditions to other SVEC members. Conditions here include but are not limited to, harmonics, voltage disturbances, frequency fluctuations, or power outages. If complaints are received and the source is suspected to be the interconnected DGR, generating activities shall cease immediately and be prohibited from resuming until conditions are addressed.

The DGR shall discontinue parallel operation when requested by SVEC. Requests for this interruption may be made on the grounds of maintenance activities, emergencies, suspected DGR interference, safety, or temporary operating parameters. SVEC shall not be responsible for unrealized gains or incurred expenses due to parallel operation shutdown.

3.03 SVEC Electric Requirements

Net Metering: Residential, Non-Residential, and Agricultural

All net metering installations, whether Residential, Non-residential, or Agricultural shall meet local, state, and federal laws concerning interconnection. A basic, but not complete, listing of requirements is below. Please reference the current code of Virginia and any subsequent SCC rulings for a comprehensive listing of interconnection requirements.

Residential

Maximum Size (Capacity):	20 kW
Maximum Annual Production:	Equal to Historical Usage
Protection Requirements:	IEEE-1547, UL-1741, Manual Disconnect Switch
Power Quality:	All Standards in Section 3.0 apply
SVEC Equipment:	IC shall not overload or cause poor conditions

Non-Residential

Maximum Size (Capacity):	1 MW
Maximum Annual Production:	Equal to Historical Usage
Protection Requirements:	IEEE-1547, UL-1741, Manual Disconnect Switch
Power Quality:	All Standards in Section 3.0 apply
SVEC Equipment:	IC shall not overload or cause poor conditions

Agricultural

Maximum Size (Capacity):	1 MW
Maximum Annual Production:	Equal to Historical Usage
Protection Requirements:	IEEE-1547, UL-1741, Manual Disconnect Switch
Power Quality:	All Standards in Section 3.0 apply
SVEC Equipment:	IC shall not overload or cause poor conditions
Aggregation:	Properties must be contiguous. Aggregated accounts move to General Service

DGR that are not larger than 20 MW Capacity

In addition to local, state, and federal laws pertaining to distribution and transmission grid interconnections, SVEC retains standards for acceptable interconnection. The intent of these requirements is to maintain the integrity of specific qualities and quantities associated with SVEC's electric distribution and transmission systems, preserve qualities and quantities for the interconnecting member and surrounding neighbors, and, most importantly, protect the safety of employees and general public.

Electric System Parameters

Voltage: SVEC Maintains a supply voltage of +- 7.5% of nominal per our terms and conditions.

- IC shall not regulate nor impact supply voltage as outlined in the following standards:

Voltage Imbalance:	ANSI C84.1 (Generally ±3.0%)
Voltage Flicker:	IEEE 1453
Voltage Fluctuation:	IEEE 1250
Voltage Harmonic Distortion:	IEEE 519
Voltage Distortions:	IEEE C62.41 and IEEE-1547

- If, after operation of the IC, SVEC determines that the IC is causing unanticipated impacts outside of the bounds of any of the above mentioned standards, SVEC will require that DGR be de-activated until impacts can be resolved by IC.

- The IC shall install three Potential Transformers at the PCC. (static inverters for net metering excluded)

Current: SVEC maintains its system capacity using guidelines specific to individual circuits and substations. Furthermore, SVEC's contingency planning often dictates certain amounts of reserve capacity be available in circuits to help with power restoration during events.

- SVEC's system is analyzed using forecasted values from historical data which is grown in manner consistent with load forecasting studies. Loading is determined based from each circuit's non-coincident peak load. These peak loads are then analyzed individually for normal operation and then together for contingency analysis.

- The IC shall not cause a decrease in available capacity of SVEC facilities. Any decrease in available capacity shall be remedied to available capacity prior to interconnection. This remedy shall be paid at full cost by the IC.

- The IC equipment shall be rated to full load current or full generation current, whichever is greater (not the net of the two).

- The IC shall interconnect with SVEC facilities and meet the following standards as related to current.

  Current Harmonic Distortion: IEEE 519

Power Factor: SVEC maintains a power factor between 0.95 lagging and unity.

- The IC shall be capable of providing kVAR and absorbing kVAR to maintain a power factor between 0.95 lagging and 0.95 leading.

- Considerations for power factor must take into account the type of generation to be interconnected. Synchronous generators shall have reactive power capabilities activated to respond to DGR kVAR needs as well as DGR voltage needs. Induction generators shall maintain voltage at required levels.

Frequency: SVEC maintains a system AC, sine wave frequency of 60 Hz.

- The IC shall not drive system frequency. The IC must be capable of receiving and reacting appropriately to any frequency fluctuations.

- The IC shall interconnect with SVEC facilities and meet the following standards as related to frequency.

Operating Frequency:	ANSI C84.1

System Protection: SVEC maintains adequate protection on transmission and distribution systems to prevent overcurrent (fault) conditions from causing public safety concerns and/or detrimental impacts to equipment.

- The IC contribution to overcurrent conditions shall minimize any impacts to SVEC's existing system and protect the general public. Any and all costs incurred by SVEC to maintain this level of protection and positive coordination shall be paid by IC at full cost. The IC is responsible for protecting its own equipment, SVEC's equipment, and the general public from electrical disturbances.

- The IC protection shall be positively coordinated with SVEC protection systems. The IC shall design the system to protect the DGR. The SVEC analysis of the IC protection scheme is solely to ensure protection of the SVEC transmission and distribution system, and not for protecting the DGR.

- The IC shall comply with IEEE-1547, Interconnection Standard.

- The IC shall meet IEEE-1547 requirements in a manner of its choice. Common relaying schemes include the following relays. (The IC shall use "Utility Grade" relays.)

Basic Relaying:	Overcurrent (Instantaneous and Time Delay) Directional current Over/Under voltage Over/Under Frequency Reverse power Forward Under power Synchronization check and permissive
Additional Relaying:	Primary and Backup protection required

- SVEC does not provide transfer trip to IC facilities.

Electric System Equipment

Overcurrent - Fault Conditions: The IC is responsible for rating equipment capable of interrupting available fault current at the PCC. All possible contributors of fault current shall be accounted for when rating equipment. For example, a generator installation with dual source feeds from SVEC would require the fault current contributions from both SVEC sources AND the generator contribution to be summed to determine the total available fault current.

- SVEC will provide available fault current to the IC. The IC shall be responsible for all calculations and sizing of the IC equipment. (Note: the IC shall notify SVEC if changes to equipment have or will occur. The IC is responsible for any and all costs associated with necessary upgrades to accommodate these changes.)

Basic Construction of Facilities: The IC facilities shall meet standards associated with the most current revision of ANSI/IEEE C.2. This includes but is not limited to:

- Overvoltage – Surge Conditions: Infrastructure and facilities must be adequately arrested for overvoltage conditions consistent with local area.

- Insulation: Insulators for all energized equipment shall meet Basic Insulation Levels per the NESC, Table 110.

- Shielding: Above ground facilities shall be adequately shielded from lightning using masts or shield wires.

- Grounding: the DGR shall be adequately grounded to meet ANSI-IEEE-80 and ANSI/IEEE C.2.

    - The facilities must be designed to accommodate total available fault current as described in Section titled "Overcurrent – Fault Conditions."

    - If the IC facilities are adjacent to SVEC facilities, grounding grids of SVEC and the DGR shall be connected. Ground grid shall use exothermic welds, or swage (compression) subgrade and mechanical connections above grade.

    - If the DGR are fenced, ground grid shall extend five (5) feet outside of fence for public safety.

Metering: SVEC requires appropriate metering installed between the IC and SVEC facilities. This metering shall be located as near the PCC as possible. All metering costs due to the IC design shall be paid at full cost by the IC.

- Instrument transformers used in metering shall conform to IEEE C57.13 and must be rated to record power (kW, kVA, kVAR) flow in either direction at full load, full capacity, and minimum loads at revenue grade accuracy.

- Meters used shall be four quadrant meters capable of storing 45 days of historical data.

3.04 SVEC Operational Requirements

The IC must recognize that the DGR design may create a need for SVEC facility upgrades. These upgrades shall use standard SVEC design, construction, and material. This is done in an effort to minimize impacts to member IC during future events that may require SVEC involvement. The IC does not have any influence over the choice of manufacturer, types, sizes, designs, or intended operations of SVEC facilities in existence nor future facilities that may be necessary to interconnect the IC facilities. The IC shall pay full cost of SVEC facilities necessary to interconnect per applicable agreements.

The IC facilities shall not cause negative impact to SVEC facilities. Locations and layouts shall be chosen so as to not impede access or hinder restoration efforts. (i.e. thought and consideration for bucket trucks, cranes, or other equipment necessary to make repairs or upgrades.)

The IC facilities shall be designed to promote positive electrical synchronization with SVEC facilities. Programmatic intelligence shall be used to automate frequency, voltage, and current synchronization between generation output and the Utility supply. This intelligence shall create safety measures, checks, and limits to counteract human error. (e.g. solid state relaying shall recognize out-of-synch conditions and disable manual closing of interconnection tie breakers.)

SVEC recognizes the need for facility maintenance based on good operating protocols. The IC must accept that there will be periods of necessary maintenance and pre-arranged down-time of generating facilities. These down-times shall be coordinated and minimized to the best of both parties' ability. SVEC requests at least thirty (30) days notification of planned maintenance activities. This is to prepare for needs of the requesting member as well as to combine any SVEC maintenance needs to the down-time to further reduce future impacts to the member.

SVEC reserves the right, at any time and without any notice, to disconnect the IC DGR from the SVEC distribution or transmission grid if SVEC deems, in its sole discretion, that safety or equipment are in jeopardy.

Operating Requirements

The IC is permitted to operate its generation in a long-term parallel format, short-term parallel format, or isolation format provided that the interconnection is synchronized and protected as described earlier in this document and consistent with the SGIA. Parallel formats include import or export of power from the IC generating facilities.

Operating Electrical Format:

Long Term Parallel Operation (time paralleled > 60 seconds)

Examples:

- Net metering (solar, hydro, wind)
- Peak Shaving (PC-3 or PC-4 rate structure, or other savings provider)
- Net Export (Power production for market sale)

Description:

For facilities intended to operate a distributed resource in parallel with the Utility system for greater than 60 seconds, a closed transition (make before break) may occur provided the interconnecting facilities meet requirements set forth earlier in this document.

Short Term Parallel (time paralleled < 60 seconds)

Examples:

Facility Maintenance
Operational Needs

Description:

For facilities intended to operate a distributed resource in parallel with the Utility system for less than 60 seconds, a closed transition (make before break) may occur provided the interconnecting facilities meet requirements set forth later in this document.

Isolated System

Examples:

Emergency back-up

Description:

For facilities intended to operate a distributed resource as an emergency back-up only, an Open Transition (break before make) transition is required. This provides that no paralleling occurs between the Utility and the IC systems. This can be accomplished by any type of properly rated switching device that inhibits both switches in the closed position simultaneously.

Operating Modes:

Load Management Mode

Configuration:

Long Term Parallel

Function:

For facilities intended to take advantage of power cost savings from demand reduction (PC-3 / PC-4 rates or other provider rate). This mode allows for the IC generator to synchronize with utility, parallel with utility, and moderate power import during demand saving events. Parallel operation may be maintained indefinitely.

Basic Operation:

Facility generators synchronize with Utility feed across the PCC. Once synchronized, PCC closes and begins to transfer load from Utility until minimum threshold is reached. Return to utility shall be a controlled and slow ramp of load transfer from facility generators to utility.

Additions:

Minimum import threshold shall be determined by a comparison of the largest singular facility load item (e.g. chiller, air handler, etc.) and the amount of reverse power SVEC distribution system can absorb on a mild weather day with largest feeder in common source substation offline and no power is delivered to substation source transmission system.

If the singular load item is less than the amount of power which can be absorbed, then the minimum threshold shall be set to always import 50 kW from Utility.

If the singular load item is greater than the amount of power that can be absorbed, then the minimum threshold shall be set to the difference between the largest load kVA and the allowable absorbed kVA.

Load Curtailment Mode

Configuration:

Short Term Parallel

Function:

For facilities intended to perform maintenance or otherwise need to isolate from Utility. Often this mode is used to allow Utility to perform maintenance on serving facilities without interruption to facility.

Basic Operation

Facility will synchronize with Utility, parallel with Utility, transfer all facility load to own generation, and separate from Utility. To return to utility, generator shall synchronize across the PCC, parallel with utility, and softly transfer load to Utility.

Emergency Standby Mode

Configuration:

Break before Make, and/or Blackstart

Function:

For facilities to handle unintended loss of Utility supply. This allows facility generators to isolate from Utility at PCC upon loss of Utility, start generators and run indefinitely and independently of Utility.

Basic Operation

Upon loss of utility, the PCC shall open and isolate Facility from Utility. To return to utility, generator shall synchronize across the PCC, parallel with utility, and softly transfer load to Utility.

Power Export/net Metering Mode

Configuration:

Long Term Parallel

Function:

For facilities intending normal operation in a parallel configuration where power flow can be bi-directional and in varying quantities.

Basic Operation

Facility shall maintain parallel operation per IEEE-1547 requirements allowing power flow per interconnection agreement.

3.05 Utility Scale Generation with Greater than 20 MW Capacity

Agreements between SVEC and the IC are required. SVEC will prepare the initial drafts, using the existing agreements between the IC and the Transmission Owner. Prior to those drafts being prepared, SVEC, or its designated engineering consultant, and the IC will discuss the technical specifications for the interconnection.

The Interconnection Agreement will address the parties' responsibilities, including financial security, with respect to this interconnection process.

In addition to the agreement with SVEC, the IC will be required to enter into a Construction Agreement with the Transmission Owner, as well as a modified PJM Wholesale Market Participation Agreement.

Financial security: The project financing will proceed in two phases. Prior to commencement of activities for each phase, the IC will provide a cash deposit to SVEC. SVEC will true up the costs at the conclusion of each phase and provide a refund to the IC of any unused funds, or the IC will make further payment to SVEC if the costs exceed the deposit amount. If the IC cancels the project, it will be provided a refund of the deposit less costs/expenses incurred by SVEC, provided that $100,000 will be non-refundable. These concepts will be detailed in the agreement referenced in Item 2 above. The estimate for Phase 1 of the project will cover the following:

- Drafting of Interconnection Agreement, Construction Agreement, and "process" agreement
- Engineering and design oversight/system support
- Impact Study
- Review of interconnect one lines
- Design, prepare specifications, bid package and project management

Phase 2 will cover the actual construction, with interim steps to be developed at the conclusion of Phase 1.

Net Metering Interconnection Notification

This Application for Interconnection form is a state-approved document and is not provided here. Please reference the Cooperative Website www.svec.coop for latest NMIN form.

Application for Level One Study

INTERCONNECTION REQUEST FORM FOR SMALL GENERATING FACILITY NOT EXCEEDING 500 kW

PURSUANT TO 20VAC5-314-40 OF THE COMMISSION'S REGULATIONS GOVERNING INTERCONNECTION OF SMALL ELECTRICAL GENERATORS, APPLICANT HEREBY GIVES NOTICE OF INTENT TO OPERATE A GENERATING FACILITY.

Section 1. Interconnection Customer Information

Name:_____

Mailing Address:_____

City, State, Zip:_____

Street Address:_____

City, State, Zip:_____

Phone Number(s):_____

Fax Number:_____ Email:_____

Utility:_____

Utility Account Number:_____

Competitive Service Provider:_____

CSP Account Number:_____

Proposed Interconnection Date:_____

Section 2. Processing Fee

The nonrefundable processing fee payable to the utility is $100.

Section 3. Small Generating Facility Information

SGF owner:_____

SGF operator:_____

Business relationship to applicant:_____

Mailing address:_____

City, State, Zip:_____

SGF Address:_____

City, State, Zip:_____

Phone Number(s):_____

Fax Number:_____ Email:_____

Fuel Type:_____

Generator Manufacturer and Model:_____

Rated Capacity in kilowatts: AC:_____ DC:_____

Inverter Manufacturer and Model:_____

Battery Backup: Yes_____ No_____

Facility schematic and equipment layout must be attached to this form.

Section 4. Information for Generators with an AC capacity in excess of 25 kW

Is the proposed generator inverter based? Yes_____ No_____

Generator Type: Inverter Induction Synchronous

Frequency:_____ Hz; Number of phases: One___ Three___

Rated Capacity: DC _____ kW; AC apparent _____ kVA; AC real _____ kW;

Power factor _____%; AC voltage _____; AC amperage_____

Facility schematic and equipment layout must be attached to this form.

Section 5. Vendor Certification

The SGF equipment is listed by Underwriters Laboratories to be in compliance with UL1741.

Signed (Vendor):_____ Date:_____

Name (printed):_____

Company:_____

Phone Number:_____

Mailing Address:_____

City, State, Zip:_____

Section 6. Electrician Certification

The generator equipment has been installed in accordance with the manufacturer's specifications as well as all applicable provisions of the National Electrical Code.

Signed (Licensed Electrician):_____ Date:_____

Name (printed):_____

License Number:_____ Phone Number:_____

Mailing Address:_____

City, State, Zip:_____

Section 7. Applicant Signature

I hereby certify that, to the best of my knowledge, all of the information provided in this Request Form is true and correct.

Signature of Applicant:_____

Date:_____

Section 8. Utility Acknowledgement of Receipt

Signed:_____

Title:_____

Utility:_____

Date:_____

Utility signature signifies only receipt of this form, in compliance with 20VAC5-314-40, the State Corporation Commission's Regulations Governing Interconnection of Small Electrical Generators.

Schedule 2

Certification of Small Generator Equipment Packages

Small generating facility equipment proposed for use separately or packaged with other equipment in an interconnection system shall be considered certified for interconnected operation if (i) it has been tested in accordance with industry standards for continuous utility interactive operation in compliance with the appropriate codes and standards referenced below by any Nationally Recognized Testing Laboratory (NRTL) recognized by the United States Occupational Safety and Health Administration to test and certify interconnection equipment pursuant to the relevant codes and standards listed in SGIP Schedule 3, (ii) it has been labeled and is publicly listed by such NRTL at the time of the interconnection application, and (iii) such NRTL makes readily available for verification all test standards and procedures it utilized in performing such equipment certification, and, with consumer approval, the test data itself. The NRTL may make such information available on its website and by encouraging such information to be included in the manufacturer's literature accompanying the equipment.

The interconnection customer must verify that the intended use of the equipment falls within the use or uses for which the equipment was tested, labeled, and listed by the NRTL.

Certified equipment shall not require further type-test review, testing, or additional equipment to meet the requirements of this interconnection procedure; however, nothing herein shall preclude the need for an on-site commissioning test by the parties to the interconnection nor follow up production testing by the NRTL.

If the certified equipment package includes only interface components (switchgear, inverters, or other interface devices), then an IC must show that the generator or other electric source being utilized with the equipment package is compatible with the equipment package and is consistent with the testing and listing specified for this type of interconnection equipment.

Provided the generator or electric source, when combined with the equipment package, is within the range of capabilities for which it was tested by the NRTL, and does not violate the interface components' labeling and listing performed by the NRTL, no further design review, testing or additional equipment on the customer side of the point of interconnection shall be required to meet the requirements of this interconnection procedure.

An equipment package does not include equipment provided by the utility.

Schedule 3

Certification Codes and Standards

IEEE Std 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems (including use of IEEE Std 1547.1 testing protocols to establish conformity)

UL 1741 Inverters, Converters, and Controllers for Use in Independent Power Systems

IEEE Std 929-2000 IEEE Recommended Practice for Utility Interface of Photovoltaic (PV) Systems

NFPA 70 (2005), National Electrical Code

IEEE Std C37.90.1-1989 (R1994), IEEE Standard Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems

IEEE Std C37.90.2 (1995), IEEE Standard Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers

IEEE Std C37.108-1989 (R2002), IEEE Guide for the Protection of Network Transformers

IEEE Std C57.12.44-2000, IEEE Standard Requirements for Secondary Network Protectors

IEEE Std C62.41.2-2002, IEEE Recommended Practice on Characterization of Surges in Low Voltage (1000V and Less) AC Power Circuits

IEEE Std C62.45-1992 (R2002), IEEE Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage (1000V and Less) AC Power Circuits

ANSI C84.1-1995 Electric Power Systems and Equipment – Voltage Ratings (60 Hertz)

IEEE Std 100-2000, IEEE Standard Dictionary of Electrical and Electronic Terms

NEMA MG 1-1998, Motors and Small Resources, Revision 3

IEEE Std 519-1992, IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems

NEMA MG 1-2003 (Rev 2004), Motors and Generators, Revision 1

Application for Level Two and Three Study

INTERCONNECTION REQUEST FORM SMALL GENERATING FACILITY LESS THAN 20 MW

Section 1. Interconnection Customer Information

Name:_____

Contact person:_____

Mailing address:_____

City, State, Zip:_____

Utility and account number:_____

Energy Service Provider and account number:_____

Facility address:_____

Telephone (Day):_____ (Evening):_____

Fax:_____ E-Mail:_____

Alternative contact information

Contact Name:_____

Title:_____

Mailing Address:_____

City, State, Zip:_____

Telephone (Day):_____ (Evening):_____

Fax:_____ E-Mail:_____

Application is for: New Small Generating Facility_____ Capacity addition____

If capacity addition to existing facility, please describe:

_____

The Small Generating Facility will supply: Interconnection Customer __ others __

Point of Interconnection:_____

Interconnection Customer's requested in-service date:_____

Section 2. Processing Fee or Deposit

If the Interconnection Request is submitted as Level 2, the nonrefundable processing fee payable to the utility is $500.

If the Interconnection Request is submitted as Level 3, the Interconnection Customer shall submit to the Utility the deposit is $1,000, or 50% of the estimated cost of the Feasibility Study, whichever is less.

Section 3. Small Generating Facility Information

Data apply only to the small generating facility, not the interconnection facilities.

Energy Source:___ Solar___ Wind___ Hydro___ Hydro Type:_____

Diesel___ Natural Gas___ Fuel Oil___ Other (describe)_____

Prime Mover: Fuel Cell____ Recip Engine____ Gas Turb____ Steam Turb____
Microturbine____ PV____ Other (describe)_____

Type of Generator: Synchronous_____ Induction_____ Inverter_____

Generator Nameplate Rating:_____ kW ___ Generator Nameplate kVAR:_____

Interconnection customer or customer-site load:_____kW

Typical reactive load:_____

Maximum physical export capability requested:_____ kW

List components of the small generating facility equipment package that are currently certified:

Equipment	Certifying Entity
1._____	1._____
2._____	2._____
3._____	3._____
4._____	4._____
5._____	5._____

Is the prime mover compatible with the certified protective relay package?
Yes____No____

Generator (or solar collector)

Manufacturer, model name & number:_____

Version Number:_____

Nameplate Output Power Rating in kW: (Summer)_____ (Winter)_____

Nameplate Output Power Rating in kVA: (Summer)_____ (Winter)_____

Individual Generator Power Factor

Rated Power Factor: Leading:_____ Lagging:_____

Total number of generators in wind farm to be interconnected pursuant to this Interconnection Request: Elevation:_____ Single phase___ Three phase___

Inverter manufacturer, model name & number:_____

List of adjustable set points for the protective equipment or software:_____

Note: A completed power systems load flow data sheet must be supplied with the Interconnection Request.

Small Generating Facility Characteristic Data (for inverter-based machines)

Max design fault contribution current:_____ Instantaneous___ or RMS_____

Harmonics characteristics:_____

Start-up requirements:_____

Small Generating Facility Characteristic Data (for rotating machines)

RPM Frequency:_____

Neutral Grounding Resistor (If Applicable):_____

Synchronous Generators:

Direct Axis Synchronous Reactance, X_d:_____ P.U.
Direct Axis Transient Reactance, X'_d:_____ P.U.
Direct Axis Subtransient Reactance, X''_d:_____ P.U.
Negative Sequence Reactance, X_2:_____ P.U.
Zero Sequence Reactance, X_0:_____ P.U.

KVA Base:_____

Field Volts:_____

Field Amperes:_____

Induction Generators:

Motoring Power (kW):_____

I^2t or K (Heating Time Constant):_____

Rotor Resistance, R_r:_____

Stator Resistance, R_s:_____

Stator Reactance, X_s:_____

Rotor Reactance, X_r:_____

Magnetizing Reactance, X_m:_____

Short Circuit Reactance, X_d''':_____

Exciting Current:_____

Temperature Rise:_____

Frame Size:_____

Design Letter:_____

Reactive Power Required In Vars (No Load):_____

Reactive Power Required In Vars (Full Load):_____

Total Rotating Inertia, H:_____ Per Unit on kVA base

Excitation and Governor System Data for Synchronous Generators Only:

Provide appropriate IEEE model block diagram of excitation system, governor system and power system stabilizer (PSS) in accordance with the regional reliability council criteria. A PSS may be determined to be required by applicable studies. A copy of the manufacturer's block diagram may not be substituted.

Section 4. Customer's Interconnection Facilities Information

Will a transformer be used between the generator and the point of interconnection ? Yes ____No ____

Will the transformer be provided by the interconnection customer? Yes ____No ____

Transformer Data (If applicable, for interconnection customer-owned transformer):

Is the transformer: single phase_____ three phase____ Size: kVA_____

Transformer Impedance:_____% on _____kVA base

If Three Phase:

Transformer Primary:_____ Volts _____ Delta _____ Wye _____ Wye Grounded

Transformer Secondary:___ Volts _____ Delta _____ Wye _____ Wye Grounded

Transformer Tertiary:_____ Volts _____ Delta _____ Wye _____ Wye Grounded

Transformer Fuse Data (If applicable, for interconnection customer-owned fuse):

(Attach copy of fuse manufacturer's minimum melt and total clearing time-current curves)

Manufacturer:_____ Type:_____ Size:_____ Speed:_____

Interconnecting Circuit Breaker (if applicable):

Manufacturer:_____ Type:_____

Load Rating (Amps):___ Interrupting Rating (Amps):___ Trip Speed (Cycles):___

Interconnection Protective Relays (If Applicable):

If microprocessor-controlled:

Manufacturer:_____ Type:_____

Model No. _____ Firmware ID:_____ Instruction Book No. _____

List of functions and adjustable setpoints for the protective equipment or software:

Setpoint Function	Minimum	Maximum
1._____	_____	_____
2._____	_____	_____
3._____	_____	_____
4._____	_____	_____
5._____	_____	_____
6._____	_____	_____

If Discrete Components:

(Enclose copy of any proposed time-overcurrent coordination curves)

Manufacturer:_____ Type:_____ Style/Catalog No.:_____ Proposed Setting:_____

Manufacturer:_____ Type:_____ Style/Catalog No.:_____ Proposed Setting:_____

Manufacturer:_____ Type:_____ Style/Catalog No.:_____ Proposed Setting:_____

Manufacturer:_____ Type:_____ Style/Catalog No.:_____ Proposed Setting:_____

Manufacturer:_____ Type:_____ Style/Catalog No.:_____ Proposed Setting:_____

Current Transformer Data (If applicable):

(Enclose copy of manufacturer's excitation and ratio correction curves)

Manufacturer:_____

Type:_____ Accuracy Class:_____ Proposed Ratio Connection:_____

Manufacturer:_____

Type:_____ Accuracy Class:_____ Proposed Ratio Connection:_____

Potential Transformer Data (If applicable):

Manufacturer:_____

Type:_____ Accuracy Class:_____ Proposed Ratio Connection:_____

Manufacturer:_____

Type:_____ Accuracy Class:_____ Proposed Ratio Connection:_____

Section 5. General Information

Enclose a copy of the site electrical one-line diagram showing the configuration of the small generating facility equipment, current and potential circuits, and protection and control schemes.

Enclose a copy of any site documentation that indicates the precise physical location of the proposed SGF (e.g., United States Geological Survey () topographic map or other diagram or documentation).

Describe the proposed location of the protective interface equipment on the property:_____

Enclose a copy of any site documentation that describes and details the operation of the protection and control schemes. Is available documentation enclosed? Yes____ No____

Enclose copies of schematic drawings for all protection and control circuits, relay current circuits, relay potential circuits, and alarm/monitoring circuits (if applicable).

Are schematic drawings enclosed? Yes____ No____

Section 6. Interconnection Customer Signature

I hereby certify that, to the best of my knowledge, all the information provided in this Interconnection Request is true and correct.

Signature:_____ Date:_____

Section 7. Utility Acknowledgement of Receipt

Signed:_____

Title:_____

Utility:_____

Date:_____

Utility signature signifies only receipt of this form, in compliance with 20VAC5-314-50 of the State Corporation Commission's Regulations Governing Interconnection of Small Electrical Generators.

Schedule 5

Application for Levels Two and Three Facilities Study

LEVELS 2 AND 3 FACILITIES STUDY INFORMATION FORM FOR SMALL GENERATING FACILITIES LESS THAN 20 MW

1. Provide a location plan and simplified one-line diagram of the plant and station facilities. For staged projects, indicate future generation, future transmission circuits, and other major future facilities. On the one-line diagram, show (i) each generator, its electric connection configuration, and its generation capacity, (ii) the location and capacity of auxiliary power, and (iii) minimum load on CT/PT.

2. One set of metering is required for each generation connection to the new ring bus or existing utility station. Indicate the number of generation connections requiring a metering set:_____

3. Indicate whether an alternate source of auxiliary power will be available during CT/PT maintenance. Yes_____ No_____

4. Indicate whether a transfer bus on the generation side of the metering will require that each meter set be designed for the total plant generation. Indicate such on the one-line diagram.

5. State the type of control system or Programmable Logic Controller (PLC) that will be located at the small generating facility.

_____
_____

6. State the protocol used by the control system or PLC.

_____

7. Describe the operation sequence and timing of the protection scheme during disconnection and reconnection to the utility by the SGF.

8. Provide a 7.5-minute quadrangle map of the site. Indicate the plant, station, transmission line, and property lines.

9. State the physical dimensions of the proposed interconnection station.

_____
_____

10. State the bus length from generation to interconnection station.

_____
_____

11. Provide a diagram or description of the point of interconnection desired by the IC that is to be the point of interconnection in the system impact study report.

12. State the line length from interconnection station to utility system.

_____
_____

13. State the pole or tower number observed in the field affixed to the pole or tower leg.

_____

14. State the number of third party easements required for distribution or transmission lines.

_____
_____

15. Provide the following proposed schedule dates:

a. Date IC to begin construction:_____

b. Date generator step-up transformers to receive back feed power:_____

c. Date IC will test SGF:_____

d. Date IC will place SGF into commercial operation:_____