New York State
Standardized Interconnection Requirements and Application Process for New Distributed Generators 2 MW or Less Connected in Parallel with Utility Distribution Systems

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Section I. Application Process

New York State
Standardized Interconnection Requirements and Application Process for New Distributed Generators 2 MW or Less Connected in Parallel with Utility Distribution Systems

A. Introduction

This section provides a framework for processing applications to:

- interconnect new distributed generation ("DG") facilities with a nameplate rating of 2 MW or less [aggregated on the customer side of the point of common coupling ("PCC")], and

- review any modifications affecting the interface at the PCC to existing DG facilities with a nameplate rating of 2 MW or less (aggregated on the customer side of the PCC) that have been interconnected to the utility distribution system and where an existing contract between the applicant and the utility is in place.

Generation neither designed to operate, nor operating, in parallel with the utility"s electrical system is not subject to these requirements. This section will ensure that applicants are aware of the technical interconnection requirements and utility interconnection policies and practices. This section will also provide applicants with an understanding of the process and information required to allow utilities to review and accept the applicants" equipment for interconnection in a reasonable and expeditious manner.

The time required to complete the process will reflect the complexity of the proposed project. Projects using previously submitted designs certified per the requirements of Section II.H will move through the process more quickly, and several steps may be satisfied with an initial application depending on the detail and completeness of the application and supporting documentation submitted by the applicant. Applicants submitting systems utilizing certified equipment however, are not exempt from providing utilities with complete design packages necessary for the utilities to verify the electrical characteristics of the generator systems, the interconnecting facilities, and the impacts of the applicants" equipment on the utilities" systems.

The application process and the attendant services must be offered on a non-discriminatory basis. The utilities must clearly identify their costs related to the applicants" interconnections, specifically those costs the utilities would not have incurred but for the applicants" interconnections. The utilities will keep a log of all applications, milestones met, and justifications for application-specific requirements. The applicants are to be responsible for payment of the utilities" costs, as provided for herein.

All application timelines shall commence the next Business Day following receipt of information from the applicant.

Staff of the Department of Public Service ("DPS Staff") will monitor the application process to ensure that applications are addressed in a timely manner. To perform this monitoring function, DPS Staff will meet periodically with utility and applicant representatives.

A glossary of terms used herein is provided in Section III.

B. Application Process Steps for Systems 50 kW or Less

Exception 1: For inverter based systems above 50 kW up to 300 kW, applicants may follow the expedited application process outlined in this section provided that the inverter based system has been certified and tested in accordance with the most recent revision of UL 1741 and the utility has approved the project accordingly. The utility has ten (10) Business Days upon receipt of the original application submittal to determine if the applicant is eligible for the expedited process and notify the applicant in writing of its findings upon review of the application. If the utility determines that an inverter based system is not eligible for the expedited application process, the applicant can:

1) Proceed with the remaining steps of Section I.C of the SIR (Systems above 50 kW up to 2 MW); or

2) Request a review by DPS Staff.

Exception 2: For non-inverter based system 50 kW or Less, the applicant should be aware that additional information and review time may be required by the utility (refer to Step 3). The applicant must include the items required in Step 5 of the Application Process Steps for Systems above 50 kW up to 2 MW in its original application. This exception should not be considered the rule, but used by the utility only in justified situations. Utilities are encouraged to use the expedited process whenever possible. The utility has ten (10) Business Days upon receipt of the original application submittal to determine and notify the applicant in writing of its findings upon review of the application.

Exception 3: For all systems 50 kW or Less, that are proposed to be installed in underground network areas, the applicant should be aware that additional information and review time may be required by the utility (refer to Step 3). In some cases, interconnection may not be allowed or approved. DG systems interconnected to underground network systems can cause unique design issues and overall reliability problems for the utilities. For this reason, additional review and analysis may be needed on a case by case basis. The utility has ten (10) Business Days upon receipt of the original application submittal to determine and notify the applicant in writing of its findings upon review of the application. If the utility determines that the DG system can't be interconnected, the applicant can request a review by DPS Staff.

STEP 1: Initial Communication from the Potential Applicant

Communication could range from a general inquiry to a completed application.

STEP 2: The Inquiry is Reviewed by the Utility to Determine the Nature of the Project

Technical staff from the utility discusses the scope of the interconnection with the potential applicant (either by phone or in person) to determine what specific information and documents (such as an application, contract, technical requirements, specifications, listing of qualified type-tested equipment/systems, applicable rate schedules, and metering requirements) will be provided to the potential applicant. The preliminary technical feasibility of the project at the proposed location may also be discussed at this time. All such information and a link to the DG portion of the utility"s website or a copy of the New York State Standardized Interconnection Requirements and Application Process for New Distributed Generators 2 MW or Less Connected in Parallel with Utility Distribution Systems ("Standardized Interconnection Requirements" or "SIR") must be provided to the applicant within three (3) Business Days following the initial communication from the potential applicant, unless the potential applicant indicates otherwise. A utility representative will be designated to serve as the single point of contact for the applicant (unless the utility informs the applicant otherwise) in coordinating the potential applicant"s project with the utility.

STEP 3: Potential Applicant Files an Application

The potential applicant submits an application package to the utility. No application fee is required of the applicant for systems 50 kW or less. A complete application package will consist of (1) a letter of authorization by the customer (if the applicant is an agent for the customer), (2) the standard single page application form completed and signed by the applicant, (3) a signed copy of the standardized contract, (4) a three line diagram for the system identifying the manufacturer and model number of the equipment, (5) a copy of the manufacturer"s data sheet(s) for the interconnection equipment, (6) a copy of the manufacturers verification test procedure(s), and (7) a copy of the equipment certification(s) to the most recent revision of UL 1741 entitled "Inverters, Converters, Controllers and Interconnection Safety Equipment for Use with Distributed Energy Resources" if applicable. The proposed equipment will be considered acceptable by the utility if meeting the requirements of Section II.H herein. If the applicant"s application is deemed not complete by the utility, within five (5) Business Days (ten (10) Business Days for non-inverter based systems and systems proposed in underground network areas) of receipt of the application package the utility will notify the applicant by email, fax, or other form of written communication, and explain the deficiencies. If the applicant"s proposed system meets the SIR technical requirements the utility will return a signed and executed New York State Standardized Contract to the applicant within ten (10) Business Days (fifteen (15) Business Days for non-inverter based systems and systems proposed in underground network areas) of receipt of the application and the

applicant may proceed with the proposed installation. If the proposed system does not meet the SIR technical requirements, the utility will so notify the applicant within ten (10) Business Days (fifteen (15) Business Days for non-inverter based systems and systems proposed in underground network areas) of receipt of the application by email, fax, or other form of written communication and explain the technical issues or problems. The utility shall also indicate in its response to the applicant whether or not it plans to witness the testing and verification process in person.

Applicants will be placed in each utility‟s interconnection inventory upon receipt of a completed application and execution of the New York State Standardized Interconnection Contract by the utility. If the final acceptance as set out in Step 6 below is not completed within twelve (12) months of receipt of such executed copy of the New York State Standardized Contract as a result of applicant inactivity, the utility has the right to notify the applicant by U.S. first class mail with delivery receipt confirmation that the applicant‟s project will be removed from the utility‟s interconnection inventory if the applicant does not respond within thirty (30) Business Days of the issue of such notification and provide a project status update and/or justification as to why the project should remain in the utility‟s interconnection inventory for an additional period of time.

For net metered systems as defined in Section II.A.6, any modifications related to existing metering configurations to allow for net metering shall be completed by the utility prior to Step 5. The utility shall complete the necessary metering changes within ten (10) business days of accepting and approving the applicant‟s application.

With respect to an applicant proposing to install a system rated 25 kW or less, that is to be net-metered, if the utility determines that it is necessary to install a dedicated transformer(s) or other equipment to protect the safety and adequacy of electric service provided to other customers, the applicant shall be informed of its responsibility for the actual costs for installing the dedicated transformer(s) and other safety equipment. Appendix D sets forth the responsibility each applicant shall have with respect to the actual cost of the dedicated transformer(s) and other safety equipment.

STEP 4: System Installation

The applicant will install the DG system according to the utility accepted design and the equipment manufacturer‟s requirements. If there are substantive design variations from the originally approved three line diagram, a revised three line diagram (and other drawings for non-inverter based systems) shall be submitted by the applicant for the utility‟s review and acceptance. All inverter based systems will be allowed to interconnect to the utility system for a period not to exceed two hours, for the sole purpose of assuring proper operation of the installed equipment.

STEP 5: The Applicant's Facility is Tested in Accordance with the Standardized Interconnection Requirements.

Verification testing will be performed by the applicant in accordance with the written verification test procedure provided by the equipment manufacturer. If the utility requested to witness the testing and verification process in person as required in Step 3, the verification testing will be performed within ten (10) Business Days of the system installation completion date, at a mutually agreeable time. If the utility has opted not to witness the test, the applicant will send the utility within five (5) Business Days of completion of such tests a written notification certifying that the system has been installed and tested in compliance with the SIR, the utility-accepted design and the equipment manufacturer"s instructions. The applicant"s facility will be allowed to commence parallel operation upon satisfactory completion of the tests in Step 5. The applicant must have complied with and must continue to comply with all contractual and technical requirements.

STEP 6: Final Acceptance

Within five (5) business days of receiving the written test notification from Step 5, the utility will issue to the applicant a formal letter of acceptance for interconnection. Within five (5) business days of the completion of the on-site verification, the utility will issue to the applicant either a formal letter of acceptance for interconnection or a detailed explanation of the deficiencies in the system.

C. Application Process Steps for Systems above 50 kW up to 2 MW

For inverter based systems above 50 kW up to 300 kW certified and tested in accordance with the most recent revision of UL 1741, applicants and utilities are encouraged to use the expedited application process (Section I.B),.

Exception 1: For all systems 50 kW up to 2 MW that are proposed to be installed in underground network areas, the applicant should be aware that a CESIR may be required by the utility, based on each utility"s specific technical requirements and design considerations on a case by case basis. In some cases, interconnection may not be allowed or approved. DG systems interconnected to underground network systems can cause unique design issues and overall reliability problems for the utilities. The utility has ten (10) Business Days upon receipt of the original application submittal to determine and notify the applicant in writing of its findings upon review of the application. If the utility determines that the DG system can"t be interconnected or requires additional information be submitted and/or additional review time is needed, the applicant can:

1) Work with the utility on an appropriate timeframe and approval schedule agreeable to both parties; or

2) Request a review by DPS Staff.

STEP 1: Initial Communication from the Potential Applicant.

Communication could range from a general inquiry to a completed application.

STEP 2: The Inquiry is Reviewed by the Utility to Determine the Nature of the Project.

Technical staff from the utility discusses the scope of the interconnection with the potential applicant (either by phone or in person) to determine what specific information and documents (such as an application, contract, technical requirements, specifications, listing of qualified type-tested equipment/systems, application fee information, applicable rate schedules, and metering requirements) will be provided to the potential applicant. The preliminary technical feasibility of the project at the proposed location may also be discussed at this time. All such information and a link to the distributed generation portion of the utility‟s website or a copy of the must be provided to the applicant within three (3) Business Days following the initial communication from the potential applicant, unless the potential applicant indicates otherwise. A utility representative will be designated to serve as the single point of contact for the applicant (unless the utility informs the applicant otherwise) in coordinating the potential applicant‟s project with the utility.

STEP 3: Potential Applicant Files an Application.

The potential applicant submits an application to the utility. The submittal must include the completed standard application form, including a copy of equipment certification to the most recent revision of UL 1741 as applicable, a three line diagram specific to the proposed system, a letter of authorization (if applicant is agent for the customer), and payment of a non-refundable $350 application fee, except that the application fee shall be refunded to net metering customer-generators unless applied toward the cost of installing a dedicated transformer (s) or other safety equipment. If the applicant proceeds with the project to completion, the application fee will be applied as a payment to the utility‟s total cost for interconnection, including the cost of processing the application. Within five (5) Business Days (ten (10) Business Days for systems proposed in underground network areas) of receiving the application, the utility will notify the applicant of receipt and whether the application has been completed adequately. It is in the best interest of the applicant to provide the utility with all pertinent technical information as early as possible in the process. If the required documentation is presented in this step, it will allow the utility to perform the required reviews and allow the process to proceed as expeditiously as possible.

Applicants will be placed in the utility‟s interconnection inventory upon receipt of the applicant‟s completed application, including receipt of the application fee. If either of the milestones identified below are not met due to customer inactivity, the utility has the right to notify the customer by U.S. first class mail with delivery receipt confirmation that the customer‟s project will be removed from the utility‟s interconnection inventory if the customer does not respond within thirty (30) Business Days of the issue of such notification and provide a project status update and/or justification as to why the project

should remain in the utility‟s interconnection inventory for an additional period of time. If there is no status update provided by the customer in response to the mailed notification, the utility may proceed to remove the application from the inventory.

- Applicant commits to utility construction of utility‟s system modifications within twelve (12) months of filing an application; or
- Final acceptance and utility cost reconciliation occurs within eighteen (18) months of filing an application.

The utility will refund any advance payments for services or construction not yet completed should the applicant be removed from the utility‟s interconnection inventory. If the costs incurred by the utility exceed the advance payments made by the applicant prior to removal from the interconnection inventory, the applicant will receive a bill for any balance due to the utility.

STEP 4: Utility Conducts a Preliminary Review and Develops a Cost Estimate for the Coordinated Electric System Interconnection Review (CESIR).

The utility conducts a preliminary review of the proposed system interconnection. Upon completion of the preliminary review, the utility will inform the applicant as to whether the proposed interconnection is viable or not, and provide the applicant with an estimate of costs associated with the completion of the CESIR. The preliminary review shall be completed and a written response detailing the outcome of the preliminary review shall be sent to the applicant within fifteen (15) Business Days of the completion of Step 3. The utility's response to those applicants proposing to interconnect aggregate DG systems above 50 kW and up to 2 MW, or proposing to interconnect to network systems will include preliminary comments on requirements for safety equipment, protective relaying, metering and telemetry**.**

STEP 5: Applicant Commits to the Completion of the CESIR

Prior to commencement of the CESIR, the applicant shall provide the following information to the utility:

- a complete detailed interconnection design package
- the name and phone number, and agent letter of authorization (if appropriate) of the individual(s) responsible for addressing technical and contractual questions regarding the proposed system, and
- if applicable, advance payment of the costs associated with the completion of the CESIR.

The complete detailed interconnection design package shall include:

(1) Electrical schematic drawing(s) reflecting the complete proposed system design which are easily interpreted and of a quality necessary for full

interconnection. The drawings shall show all electrical components proposed for the installation and their connections to the existing on-site electrical system from that point to the PCC.

(2) A complete listing of all interconnection devices proposed for use at the PCC. A set of specifications for this equipment shall be provided by the applicant upon request from the utility.

(3) The written verification test procedure provided by the equipment manufacturer, if such procedure is required by this document. For non-inverter based systems, testing equipment must be capable of measuring that protection settings operate within the appropriate times and thresholds set forth in Section II.

(4) Three (3) copies of the following information:

- Proposed three line diagram of the generation system showing the interconnection of major electrical components within the system. Proposed equipment ratings clearly need to indicate:

  1) Number, individual ratings, and type of units comprising the above rating;

  2) General high voltage bus configuration and relay functions; and

  3) Proposed generator step-up transformer MVA ratings, impedances, tap settings and winding voltage ratings;

- Electrical studies as requested by the utility to demonstrate that the design is within acceptable limits, inclusive and limited to the following: system fault, relay coordination, flicker, voltage drop, and harmonics. This shall include all relay, communication, and controller set points.

STEP 6: **Utility Completes the CESIR**

The CESIR will consist of two parts:

(1) a review of the impacts to the utility system associated with the interconnection of the proposed system, and

(2) a review of the proposed system‟s compliance with the applicable criteria set forth below.

A CESIR will be performed by the utility to determine if the proposed generation on the circuit results in any relay coordination, fault current, and/or voltage regulation problems. A full CESIR may not be needed if the aggregate generation is less than (1) 50 kW on a single-phase branch of a radial distribution circuit; or (2) 150 kW on a single distribution feeder.

The CESIR shall be completed within sixty (60) Business Days of receipt of the information set forth in Step 5. For systems utilizing type-tested equipment, the time required to complete the CESIR may be reduced.

Upon completion of the CESIR, the utility will provide the following, in writing, to the applicant:

(1) utility system impacts, if any;

(2) notification of whether the proposed system meets the applicable criteria considered in the CESIR process;

(3) if applicable, a description of where the proposed system is not in compliance with these requirements;

(4) Subject to subsections (a) through (d) below, a good faith, detailed estimate of the total cost of completion of the interconnection of the proposed system and/or a statement of cost responsibility for a dedicated transformer(s) or other required interconnection equipment:

(a) with respect to an applicant that is <u>not</u> to be net-metered, an estimate shall be provided and shall include the costs associated with any required modifications to the utility system, administration, metering, and on-site verification testing;

(b) with respect to an applicant that <u>is</u> to be net-metered and that is a Farm Wind, Farm Waste, Non-Residential Wind, Non-Residential Micro-hydroelectric, Non-Residential Fuel Cell or Non-Residential Solar applicant intending to install electric generating equipment with a rated capacity of more than 25 kW, an estimate shall be provided and shall include the applicant's responsibility for the actual cost of installing any dedicated

transformer(s) and other safety equipment up to the maximum set forth in subsection (c) below;

(c) with respect to an applicant that is to be net-metered, if the utility determines that it is necessary to install a dedicated transformer(s) or other equipment to protect the safety and adequacy of electric service provided to other customers, the applicant shall be informed of its responsibility for the actual costs for installing the dedicated transformer(s) and other safety equipment. The following table reflects the maximum responsibility each designated applicant shall have with respect to the actual cost of the dedicated transformer(s) and other safety equipment;

Appendix D sets forth the responsibility each applicant shall have with respect to the actual cost of the dedicated transformer(s) and other safety equipment.

STEP 7: Applicant Commits to Utility Construction of Utility's System Modifications.

The applicant and utility will execute the New York Standardized Contract for interconnection and the applicant will provide the utility with an advance payment for the utility‟s estimated costs as identified in Step 6 (estimated costs will be reconciled with actual costs in Step 11).

STEP 8: Project Construction.

The applicant will build the facility in accordance with the utility-accepted design. The utility will commence construction/installation of system modifications and metering requirements as identified in Step 6. Utility system modifications will vary in construction time depending on the extent of work and equipment required. The schedule for this work is to be discussed and agreed upon with the applicant in Step 6.

STEP 9: The Applicant's Facility is Tested in Accordance with the Standardized Interconnection Requirements.

The verification testing will be performed by the applicant in accordance with the written test procedure(s) provided by the applicant in Step 5 and any site-specific requirements identified by the utility in Step 6. The final verification testing will be conducted within ten (10) Business Days of complete installation at a mutually agreeable time, and the utility shall be given the opportunity to witness the tests. If the utility opts not to witness the tests, the applicant will send the utility within five (5) Business Days of completion of such testing a written notification certifying that the system has been installed and tested in compliance with the SIR, the utility-accepted design, and the equipment

manufacturer‟s instructions.

STEP 10: Interconnection.

The applicant‟s facility will be allowed to commence parallel operation upon satisfactory completion of the tests in Step. In addition, the applicant must have complied with an must continue to comply with the contractual and technical requirements.

STEP 11: Final Acceptance and Utility Cost Reconciliation.

If the utility witnessed the verification testing, then, within ten (10) Business Days of the completion of such testing, the utility will issue to the applicant either a formal letter of acceptance for interconnection or a detailed explanation of the deficiencies in the system. If the utility did not witness the verification testing, then, within ten (10) Business Days of receiving the written test notification from Step 9, the utility will either issue to the applicant a formal letter of acceptance for interconnection, will request that the applicant and utility set a date and time verification witness operation of the DG system. This witnessed verification testing must be completed within twenty (20) Business Days after being requested. Within ten (10) Business Days of the completion of any such witnessed testing, the utility will issue to the applicant either a formal letter of acceptance for interconnection or a detailed explanation of the deficiencies in the DG system. At this time, the utility will also reconcile its actual costs related to the applicant‟s project against the application fee and advance payments made by the applicant. The applicant will receive either a bill for any balance due or a reimbursement for overpayment as determined by the utility‟s reconciliation, except that a net metering applicant may not be charged in excess of the cost of installing the dedicated transformer(s) or other safety equipment described above in Step 6. The applicant may contest the reconciliation with the utility. If the applicant is not satisfied, a formal complaint may be filed with the Commission.

D. Web-Based Standard Interconnection Requirements

Each utility shall maintain a web-based system to provide customers and contractors current information regarding the status of their SIR application process. The system shall be customer specific and post the current status of the SIR process. At a minimum the following content shall be provided:

1. The applicant‟s name and project/application identification number.
2. Description of the project, including at a minimum, the project‟s type (energy source), size, metering, and location.
3. SIR project application status, including all the steps completed and to be completed, along with corresponding completion/deadline dates associated with each step.
    - If the next action is to be taken by the utility, the expected date that action will be completed,

- If the next action is to be taken by the applicant, what exactly is required and a contact for more information,

4. Information regarding any outstanding information request made by the utility of the applicant, and
5. The status of all amounts paid and/or due to the utility by the applicant.

Access shall be available for the customer and their authorized agent(s), such that both can access the information. The web site must be, however, secure and private from unauthorized access.

The utility web site shall also provide the ability for applicants with systems 25 kW and less to submit their application for interconnection via the web. The web-based application process must be consistent with Appendix B of the SIR and include the ability to attach associated documentation or drawings associated with each project. Electronic signatures shall be accepted and approved by utilities on associated documentation for this process.

Section II. Interconnection Requirements

A. Design Requirements

1. Common

The generator-owner shall provide appropriate protection and control equipment, including a protective device that utilizes an automatic disconnect device that will disconnect the generation in the event that the portion of the utility system that serves the generator is de-energized for any reason or for a fault in the generator-owner‟s system. The generator-owner‟s protection and control equipment shall be capable of automatically disconnecting the generation upon detection of an islanding condition and upon detection of a utility system fault.

The generator-owner‟s protection and control scheme shall be designed to ensure that the generation remains in operation when the frequency and voltage of the utility system is within the limits specified by the required operating ranges. Upon request from the utility, the generator-owner shall provide documentation detailing compliance with the requirements set forth in this document.

The specific design of the protection, control and grounding schemes will depend on the size and characteristics of the generator-owner‟s generation, as well the generator-owner‟s load level, in addition to the characteristics of the particular portion of the utility‟s system where the generator-owner is interconnecting.

The generator-owner shall have, as a minimum, an automatic disconnect device(s) sized to meet all applicable local, state, and federal codes and operated by over and under voltage and over and under frequency protection. For three-phase installations, the over and under voltage function should be included for each phase and the over and under frequency protection on at least one phase. All phases of a generator or inverter interface shall disconnect for voltage or frequency trip conditions sensed by the protective devices. Voltage protection shall be wired phase to ground for single phase installations and for applications using wye grounded-wye grounded service transformers.

The settings below are listed for single-phase and three-phase applications using wye grounded-wye grounded service transformers or wye grounded-wye grounded isolation transformers. For applications using other transformer connections, a site-specific review will be conducted by the utility and the revised settings identified in Step 6 of the Application Process.

The requirements set forth in this document are intended to be consistent with those contained in the most current version of IEEE Std 1547, *Standard for Interconnecting Distributed Resources with Electric Power Systems*. The requirements in IEEE Std 1547 above and beyond those contained in this document shall be followed Any other Standards included in or referenced to in IEEE Std 1547 shall be adhered to.

Voltage Response

The required operating range for the generators shall be from 88% to 110% of nominal voltage magnitude. For excursions outside these limits the protective device shall automatically initiate a disconnect sequence from the utility system as detailed in the most current version of IEEE Std 1547. Clearing time is defined as the time the range is initially exceeded until the generator-owner‟s equipment ceases to energize the PCC and includes detection and intentional time delay.

Frequency Response

The required operating range for the generators shall be from 59.3 Hz to 60.5 Hz. For generators greater than 30 kW the utility may request that the generator operate at frequency ranges below 59.3 Hz as defined in IEEE Std 1547. For excursions outside these limits the protective device shall automatically initiate a disconnect sequence from the utility system as detailed in the most current version of IEEE Std 1547. Clearing time is defined as the time the range is initially exceeded until the generator-owner‟s equipment ceases to energize the PCC and includes detection and intentional time delay.

If the generation facility is disconnected as a result of the operation of a protective device, the generator-owner‟s equipment shall remain disconnected until the utility‟s service voltage and frequency have recovered to acceptable voltage and frequency limits for a minimum of five (5) minutes. Systems greater than 25 kW that do not utilize inverter based interface equipment shall not have automatic recloser capability unless otherwise approved by the utility. If the utility determines that a facility must receive permission to reconnect, then any automatic reclosing functions must be disabled and verified to be disabled during verification testing.

2. Synchronous Generators

Synchronous generation shall require synchronizing facilities. These shall include automatic synchronizing equipment or manual synchronizing with relay supervision, voltage regulator, and power factor control.

For all synchronous generators sufficient reactive power capability shall be provided by the generator-owner to withstand normal voltage changes on the utility‟s system. The generator voltage VAR schedule, voltage regulator, and transformer ratio settings shall be jointly determined by the utility and the generator-owner to ensure proper coordination of voltages and regulator action. Generator-owners shall have synchronous generator reactive power capability to withstand voltage changes up to 5% of the base voltage levels.

A voltage regulator must be provided and be capable of maintaining the generator voltage under steady state conditions within plus or minus 1.5% of any set point and within an operating range of plus or minus 5% of the rated voltage of the generator.

Generator-owners shall adopt one of the following grounding methods for synchronous generators:

a) Solid grounding
b) High- or low-resistance grounding
c) High- or low-reactance grounding
d) Ground fault neutralizer grounding

Synchronous generators shall not be permitted to connect to utility secondary network systems without the acceptance of the utility.

3. Induction Generators

Induction generation may be connected and brought up to synchronous speed (as an induction motor) if it can be demonstrated that the initial voltage drop measured at the PCC is acceptable based on current inrush limits. The same requirements also apply to induction generation connected at or near synchronous speed because a voltage dip is present due to an inrush of magnetizing current. The generator-owner shall submit the expected number of starts per specific time period and maximum starting kVA draw data to the utility.

Starting or rapid load fluctuations on induction generators can adversely impact the utility‟s system voltage. Corrective step-switched capacitors or other techniques may be necessary. These measures can, in turn, cause ferroresonance. If these measures (additional capacitors) are installed on the customer‟s side of the PCC, the utility will review these measures and may require the customer to install additional equipment.

4. Inverters

Direct current generation can only be installed in parallel with the utility‟s system using a synchronous inverter. The design shall be such as to disconnect this synchronous inverter upon a utility system interruption.

It is recommended that equipment be selected from the Department of Public Service "Certified Interconnection Equipment list" maintained on the Commission‟s website. Interconnected DG systems utilizing equipment not found in such list must meet all functional requirements of the current version of IEEE Std 1547 and be protected by utility grade relays (as defined in these requirements) using settings approved by the utility and verified in the field. The field verification test must demonstrate that the equipment meets the voltage and frequency requirements detailed in this section.

Synchronization or re-synchronization of an inverter to the utility system shall not result in a voltage deviation that exceeds the requirements contained in Section II.E, Power Quality. Only inverters designed to operate in parallel with the utility system shall be utilized for that purpose.

5. Minimum Protective Function Requirements

Protective system requirements for distributed generation facilities result from an assessment of many factors, including but not limited to:

• Type and size of the distributed generation facility
• Voltage level of the interconnection
• Location of the distributed generation facility on the circuit
• Distribution transformer
• Distribution system configuration
• Available fault current
• Load that can remain connected to the distributed generation facility under isolated conditions
• Amount of existing distributed generation on the local distribution system.

As a result, protection requirements cannot be standardized according to any single criteria. Minimum protective function requirements shall be as detailed in the table below. ANSI C37.2, Electric Power System Device Function Numbers, are listed with each function.

Synchronous Generators	Induction Generators	Inverters
Over/Under Voltage (Function 27/59)	Over/Under Voltage (Function 27/59)	Over/Under Voltage (Function 27/59)
Over/Under Frequency (Function 81O/81U)	Over/Under Frequency (Function 81O/81U)	Over/Under Frequency (Function 81O/81U)
		Anti-Islanding Protection

The need for additional protective functions shall be determined by the utility on a case-by-case basis. If the utility determines a need for additional functions, it shall notify the generator-owner in writing of the requirements. The notice shall include a description of the specific aspects of the utility system that necessitate the addition, and an explicit justification for the necessity of the enhanced capability. The utility shall specify and provide settings for those functions that the utility designates as being required to satisfy protection practices. Any protective equipment or setting specified by the utility shall not be changed or modified at any time by the generator-owner without written consent from the utility.

The generator-owner shall be responsible for ongoing compliance with all applicable local, state, and federal codes and standardized interconnection requirements as they pertain to the interconnection of the generating equipment. Protective devices shall utilize their own current transformers and potential transformers and not share electrical equipment associated with utility revenue metering.

A failure of the generator-owner‟s protective devices, including loss of control power, shall open the automatic disconnect device, thus disconnecting the generation from the utility system. A generator-owner‟s protection equipment shall utilize a non-volatile

memory design such that a loss of internal or external control power, including batteries, will not cause a loss of interconnection protection functions or loss of protection set points.

All interface protection and control equipment shall operate as specified independent of the calendar date.

6. Metering

The need for additional revenue metering or modifications to existing metering will be reviewed on a case-by-case basis and shall be consistent with metering requirements adopted by the Commission.

Any incremental metering costs are included in interconnection costs that may be required of an applicant.

The following tables summarize the New York Net Metering Rules:

New York (PSL §66-j) - Net Metering*						
Incentive Type:	Net Metering Rules					
Eligible Renewable/Other Technologies:	Solar / Micro-hydroelectric		Biogas	Micro CHP	Fuel Cell	
Applicable Sectors:	Residential	Non-Residential	Farm-Waste	Residential	Residential	Non-Residential
Limit on System Size:	25 kW	Up to 2 MW	1 MW	10 kW	10 kW	Up to 1.5 MW
Remote Net Metering	No***	Yes	Yes	No	No	
Limit on Overall Enrollment:**	1% of 2005 Electric Demand per IOU for Solar, Biogas, Micro CHP, Micro-hydroelectric and Fuel Cells combined					

New York (PSL §66-l) - Net Metering*			
Incentive Type:	Net Metering Rules		
Eligible Renewable/Other Technologies:	Wind		
Applicable Sectors:	Residential	Non-Residential	Farm-Service Wind
Limit on System Size:	25 kW	Up to 2 MW	500 kW
Remote Net Metering	No***	Yes	Yes
Limit on Overall Enrollment:	.3% of 2005 Demand per IOU		

* Refer to specific utility tariff leaves for more detailed rules and regulations applicable to net metering.
** In Case 12-E-0343, the limit on overall enrollment was raised from 1% to 3% for Central Hudson Gas & Electric.
*** Residential customers who own or operate a farm operation as defined by Agriculture and Markets Law §301(11) and locate solar photovoltaic or micro-hydroelectric on property owned or leased by the customer are also eligible for remote net metering.

B. Operating Requirements

The generator-owner shall provide a 24-hour telephone contact. This contact will be used by the utility to arrange access for repairs, inspection or emergencies. The utility will make such arrangements (except for emergencies) during normal business hours.
Voltage and frequency trip set point adjustments shall be accessible to service personnel only.
Any changes to these settings must be reviewed and approved by the utility.

The generator-owner shall not supply power to the utility during any outages of the utility system that serves the PCC. The generator-owner's generation may be operated during such outages only with an open tie to the utility. Islanding will not be permitted. The generator-owner shall not energize a de-energized utility circuit for any reason.
The disconnect switch specified for system size larger than 25 kW and non-inverter based systems of 25 kW or less in Section II.D, Disconnect Switch, may be opened by the utility at any time for any of the following reasons:

a. to eliminate conditions that constitute a potential hazard to utility personnel or the general public;

b. pre-emergency or emergency conditions on the utility system;

c. a hazardous condition is revealed by a utility inspection;

d. protective device tampering;

e. parallel operation prior to utility approval to interconnect.

The disconnect switch may be opened by the utility for the following reasons, after notice to the responsible party has been delivered and a reasonable time to correct (consistent with the conditions) has elapsed:

a. A generator-owner has failed to make available records of verification tests and maintenance of its protective devices;

b. A generator-owner's system adversely impacts the operation of utility equipment or equipment belonging to other utility customers;

c. A generator-owner‟s system is found to adversely affect the quality of service to adjoining customers.

The utility will provide a name and telephone number so that the generator-owner can obtain information about the utility lock-out.

The generator-owner shall be allowed to disconnect from the utility without prior notice in order to self generate.

Under certain conditions a utility may require direct transfer trip (DTT). The utility shall provide detailed evidence as to the need for DTT.

If a generator-owner proposes any modification to the system that has an impact on the interface at the PCC after it has been installed and a contract between the utility and the generator-owner has already been executed, then any such modifications must be reviewed and approved by the utility before the modifications are made.

C. Dedicated Transformer

The utility reserves the right to require a power-producing facility to connect to the utility system through a dedicated transformer. The transformer shall either be provided by the connecting utility at the generator-owner‟s expense, purchased from the utility, or conform to the connecting utility‟s specifications. The transformer that is part of the normal electrical service connection of a generator-owner‟s facility may meet this requirement if there are no other customers supplied from it. A dedicated transformer is not required if the installation is designed and coordinated with the utility to protect the utility system and its customers adequately from potential detrimental net effects caused by the operation of the generator.

If the utility determines a need for a dedicated transformer, it shall notify the generator-owner in writing of the requirements. The notice shall include a description of the specific aspects of the utility system that necessitate the addition, the conditions under which the dedicated transformer is expected to enhance safety or prevent detrimental effects, and the expected response of a normal, shared transformer installation to such conditions.

D. Disconnect Switch

Generating equipment with system size larger than 25 kW and non-inverter based systems of 25 kW or less shall be capable of being isolated from the utility system by means of an external, manual, visible, gang-operated, load break disconnecting switch. The disconnect switch shall be installed, owned, and maintained by the customer-generator, and located between the generating equipment and its interconnection point with the utility system.

The disconnect switch must be rated for the voltage and current requirements of the installation.

The basic insulation level (BIL) of the disconnect switch shall be such that it will coordinate with that of the utility‟s equipment. Disconnect devices shall meet applicable requirements of the most current revision of UL, ANSI, and IEEE standards, and shall be installed to meet all applicable local, state, and federal codes. (New York City Building Code may require additional certification.)

The disconnect switch shall be clearly marked, "Generator Disconnect Switch," with permanent 3/8 inch or larger letters.

The disconnect switch shall be located within 10 feet of the utility‟s external electric service meter. If such location is not possible, the customer-generator will propose, and the utility will approve, an alternate location. The location and nature of the disconnect switch shall be indicated in the immediate proximity of the electric service entrance. The disconnect switch shall be readily accessible for operation and locking by utility personnel in accordance with Section II.B, Operating Requirements. The disconnect switch must be lockable in the open position with a 3/8” shank utility padlock.

For installations above 600V or with a full load output of greater than 960A**,** a draw-out type circuit breaker with the provision for padlocking at the draw-out position will not be an acceptable disconnect switch for the purposes of this requirement unless the use of such a circuit breaker is specifically granted by the utility, based on site-specific technical requirements. If the utility grants such use, the generator-owner will be required, upon the utility‟s request, to provide qualified operating personnel to open the draw-out circuit breaker and ensure isolation of the DG system, with such operation to be witnessed by the utility followed immediately by the utility locking the device to prevent re-energization. In an emergency or outage situation, where there is no access to the draw-out breaker or no qualified personnel, utilities may disconnect the electric service to the

premise in order to isolate the DG system.

E. Power Quality

The maximum harmonic limits for electrical equipment shall be in accordance with IEEE 519 to limit the maximum individual frequency voltage harmonic to 3% of the fundamental frequency and the voltage Total Harmonic Distortion (THD) to 5% on the utility side of the PCC. In addition, any voltage fluctuation resulting from the connection of the customer's energy producing equipment to the utility system must not exceed the limits defined by the maximum permissible voltage fluctuations border line of visibility curve. This requirement is necessary to minimize the adverse voltage effect upon other customers on the utility system.

F. Power Factor

If the average power factor, as measured at the PCC, is less than 0.9 (leading or lagging), the method of power factor correction necessitated by the installation of the generator will be negotiated with the utility as a commercial item. If the average power factor of the generator is proven to be above the minimum of 0.9 (leading or lagging) by the customer and accepted by the utility, that power factor value shall be used for any further utility design calculations and requirements.

Induction power generators may be provided VAR capacity from the utility system at the generator-owner‟s expense. The installation of VAR correction equipment by the generator-owner on the generator-owner‟s side of the PCC must be reviewed and approved by the utility prior to installation.

G. Islanding

Generation interconnection systems must be designed and operated so that islanding is not sustained on utility distribution circuits. The requirements listed in this document are designed and intended to prevent islanding.

H. Equipment Certification

In order for the equipment to be acceptable for interconnection to the utility system without additional protective devices, the interface equipment must be equipped with the minimum protective function requirements listed in the table in Section II.A.5 and be tested by a Nationally Recognized Testing Laboratory (NRTL) recognized by the United States Occupational Safety and Health Administration (OSHA) in compliance with the most current revision of UL 1741.

For each interconnection application, documentation including the proposed equipment certification, stating compliance with UL 1741 by an NRTL, shall be provided by the

applicant to the utility. Supporting information from an NRTL website or UL‟s website stating compliance is acceptable for documentation.

If an equipment manufacturer, vendor, or any other party desires, documentation indicating compliance as stated above may be submitted to the Department of Public Service for listing under the "Certified Interconnection Equipment (Certified Equipment)" list on the Commission‟s website (http://www.dps.ny.gov/distgen.htm).

Certification information for equipment tested and certified to the most current revision of UL 1741by a non-NRTL shall be provided by the manufacturer, or vendor to the contacts listed on the Public Service Commission‟s website (http://www.dps.ny.gov/distgen.htm) for review before final acceptance and posting under the Certified Equipment list. Utilities are not responsible for reviewing and approving equipment tested and certified by a non-NRTL.

If equipment is UL 1741 certified by an NRTL and compliance documentation is submitted to the utility, the utility shall accept such equipment for interconnection in New York state. All equipment certified to the most current revision of UL 1741 by an NRTL shall be deemed „certified equipment‟ even if it does not appear on the Commission‟s website under the Certified Equipment list.

Utility grade relays need not be certified per the requirements of this section.

For DG systems that are already interconnected with the utility‟s electrical system and seek to use the New York State Standardized Interconnection Requirements and Application Process in order to qualify for net metering, no DG system will be required to obtain recertification the latest equipment certification standards, as long as the DG system met the equipment certification requirements by the utility in effect at the time of the DG unit‟s interconnection.

I. Verification Testing

All interface equipment must include a verification test procedure as part of the documentation presented to the utility. Except for the case of small single-phase inverters as discussed later, the verification test must establish that the protection settings meet the SIR requirements. The verification testing may be site-specific and is conducted periodically to assure continued acceptable performance.

Upon initial parallel operation of a generating system, or any time interface hardware or software is changed, the verification test must be performed. A qualified individual must perform verification testing in accordance with the manufacturer‟s published test procedure. Qualified individuals include professional engineers, factory-trained and certified technicians, and licensed electricians with experience in testing protective equipment. The utility reserves the right to witness verification testing or require written certification that the testing was successfully performed.

Verification testing shall be performed at least once every four years. All verification tests prescribed by the manufacturer shall be performed. If wires must be removed to perform certain tests, each wire and each terminal must be clearly and permanently marked. The generator-owner shall maintain verification test reports for inspection by the utility.

Single-phase inverters and inverter systems rated 25 kW and below shall be verified upon initial parallel operation and once every four years as follows: the generator-owner shall interrupt the utility source and verify that the equipment automatically disconnects and does not reconnect for at least five minutes after the utility source is reconnected. The owner shall maintain a log of these operations for inspection by the connecting utility. Any system that depends upon a battery for trip power shall be checked and logged at least annually for proper voltage. Once every four (4) years the battery must be either replaced or a discharge test performed.

J. Interconnection Inventory

To ensure applications are addressed in a timely manner and monitor the overall interconnection activities, utilities shall submit an SIR inventory of projects quarterly to the Public Service Commission by January 31, April 30, July 31 and October 31 of each year. Utilities shall provide DPS Staff with redacted and unredacted versions of its interconnection inventory for the associated time period in Excel format. . At a minimum the following information shall be provided in the inventory:

1. Utility Name
2. Applicant Name
3. System Type
4. System Capacity
5. Net Metered (Yes/No)
6. Protective Equipment
7. Application Review Start and End date
8. Preliminary Review Start and End date
9. CESIR Start and End date
10. CESIR Costs
11. Utility Interconnection Costs
12. Customer Interconnection Costs
13. Utility System Upgrade Costs
14. Customer System Upgrade Costs
15. Verification Testing date
16. Final Letter of Acceptance date
17. Total percentage of SIR connected demand

Section III. Glossary of Terms

Automatic Disconnect Device: An electronic or mechanical switch used to isolate a circuit or piece of equipment from a source of power without the need for human intervention.

Business Day: Monday through Friday, excluding utility holidays.

Cease to Energize: Cessation of energy flow capability

Coordinated Electric System Interconnection Review: Any studies performed by utilities to ensure that the safety and reliability of the electric grid with respect to the interconnection of distributed generation as discussed in this document.

Customer-Generator: A utility customer who owns or operates electric generating equipment located and used at the customer‟s premises, and/or the utility customer‟s agent.

Dedicated Transformer: A transformer installed by the utility to isolate a DG system.

Direct Transfer Trip: Remote operation of a circuit breaker by means of a communication channel.

Disconnect (verb): To isolate a circuit or equipment from a source of power. If isolation is accomplished with a solid-state device, "Disconnect" shall mean to cease the transfer of power.

Disconnect Switch: A mechanical device used for isolating a circuit or equipment from a source of power.

Draw-out Type Circuit Breaker: Circuit breakers that are disconnected by physically separating, or racking, the breaker assembly away from the switchgear bus.

Farm Waste, Net Meter, Farm Applicant: A farm applicant who is proposing to install a farm waste anaerobic digester generating system, not to exceed 1 MW, at a farm, per the requirements of New York State Public Service Law §66-j.

Fuel Cell, Net Meter, Residential Applicant: A residential applicant who is proposing to install a fuel cell electric generating system located and used at the applicant's premises, not to exceed a combined rated capacity of not more than 10 kW, per the requirements of New York State Public Service Law §66-j.

Fuel Cell, Net Meter, Non-Residential Applicant: A non-residential applicant who is proposing to install a fuel cell electric generating system located and used at the applicant's premises, not to exceed a combined rated capacity of not more than 1.5 MW, per the requirements of New York State Public Service Law §66-j.

Generator-Owner: An applicant to operate on-site power generation equipment in parallel with the utility grid per the requirements of this document.

Islanding: A condition in which a portion of the utility system that contains both load and distributed generation is isolated from the remainder of the utility system. (Adopted from
IEEE Std 929.)

Micro-Combined Heat and Power, Net Meter, Residential Applicant: A residential applicant who is proposing to install a micro-combined heat and power (Micro-CHP) generating system located and used at the applicant's premises, not to exceed 10 kW, per the requirements of New York State Public Service Law §66-j.

Micro-Hydroelectric, Net Meter, Residential Applicant: A residential applicant who is proposing to install a micro-hydroelectric generating equipment located and used at the applicant‟s premises, not to exceed 25 kW, per the requirement of New York State Public Service Law §66-j.

Micro-Hydroelectric, Net Meter, Non-Residential Applicant: A non-residential applicant who is proposing to install a micro-hydroelectric generating equipment located and used at the applicant‟s premises, not to exceed 2 MW, per the requirement of New York State Public Service Law §66-j.

Point of Common Coupling: The point at which the interconnection between the electric utility and the customer interface occurs. Typically, this is the customer side of the utility revenue meter.

Preliminary Review: A review of the generator-owner‟s proposed system capacity, location on the utility system, system characteristics, and general system regulation to determine if the interconnection is viable.

Protective Device: A device that continuously monitors a designated parameter related to the operation of the generation system that operates if preset limits are exceeded

Remote Net Metering: Per the Public Service Law (PSL) §66-j & §66-l Remote Net Metering allows certain types of customers and/or distributed generation technology (see tables above pp. 17 and 18) the option to apply excess generation credits from the customer‟s generator to certain other meters on property that is owned or leased by the same customer and located within the service territory of the same utility to which the customer-generator‟s net energy meters are interconnected and within the same load zone.

Required Operating Range: The range of magnitudes of the utility system voltage or frequency where the generator-owner‟s equipment, if operating, is required to remain in operation for the purposes of compliance with UL 1741. Excursions outside these ranges

must result in the automatic disconnection of the generation within the prescribed time limits

Safety Equipment: Includes dedicated transformers or equipment and facilities to protect the safety and adequacy of electric service provided to other customers.

Solar, Net Meter, Residential Applicant: A residential applicant who is proposing to install a photovoltaic generating system, not to exceed 25 kW, in an owner occupied residence per the requirements of New York State Public Service Law §66-j.

Solar, Net Meter, Non-Residential Applicant: A non-residential applicant who is proposing to install a solar generating system located and used at the applicant's premises, not to exceed 2 MW, pursuant to New York State Public Service Law §66-j.

Utility Grade Relay: A relay that is constructed to comply with, as a minimum, the most current version of the following standards for non-nuclear facilities:

Standard	Conditions Covered
ANSI/IEEE C37.90	Usual Service Condition Ratings - Current and Voltage Maximum design for all relay AC and DC auxiliary relays Make and carry ratings for tripping contacts Tripping contacts duty cycle Dielectric tests by manufacturer Dielectric tests by user
ANSI/IEEE C37.90.1	Surge Withstand Capability (SWC) Fast Transient Test
IEEE C37.90.2	Radio Frequency Interference
IEEE C37.98	Seismic Testing (fragility) of Protective and Auxiliary Relays
ANSI C37.2	Electric Power System Device Function Numbers
IEC 255-21-1	Vibration
IEC 255-22-2	Electrostatic Discharge
IEC 255-5	Insulation (Impulse Voltage Withstand)

Verification Test: A test performed upon initial installation and repeated periodically to determine that there is continued acceptable performance.

Wind, Net Meter, Residential Applicant: A residential applicant who is proposing to install a wind electric generating system, not to exceed a combined rated capacity of 25

kW, located and used at the applicant‟s primary residence, per the requirements of New York State Public Service Law §66-1.

Wind, Net Meter, Non-Residential Applicant: A non-residential applicant who is proposing to install a wind electric generating system located and used at the applicant's premises, not to exceed 2 MW, pursuant to New York State Public Service Law §66-1.

Wind, Net Meter, Farm Applicant: A farm applicant who is proposing to install a wind electric generating system, not to exceed a combined rated capacity of 500 kW, located and used at the applicant‟s primary residence, per the requirements of New York State Public Service Law §66-1.

APPENDIX A

NEW YORK STATE
STANDARDIZED CONTRACT
FOR INTERCONNECTION OF NEW DISTRIBUTED GENERATION UNITS WITH CAPACITY OF 2 MW OR LESS CONNECTED IN PARALLEL WITH UTILITY DISTRIBUTION SYSTEMS

Customer Information:	**Utility Information:**
Name: _____	Name: _____
Address: _____	Address: _____
Telephone: _____	Telephone: _____
Fax: _____	Fax: _____
Email: _____	Email: _____
Unit Application/File No. _____	Utility Account Number:_____

DEFINITIONS

Dedicated Facilities means the equipment and facilities on the Utility‟s system necessary to permit operation of the Unit in parallel with the Utility‟s system.

Delivery Service means the services the Utility may provide to deliver capacity or energy generated by Customer to a buyer to a delivery point(s), including related ancillary services.

"Net energy metering" means the use of a net energy meter to measure, during the billing period applicable to a customer-generator, the net amount of electricity supplied by an electric corporation and provided to the corporation by a customer-generator.

"SIR" means the New York State Standardized Interconnection Requirements for new distributed generation units with a nameplate capacity of 2 MW or less connected in parallel with the Utility‟s distribution system

"Unit" means the distributed generation Unit with a nameplate capacity of 2 MW or less located on the Customer‟s premises at the time the Utility approves such Unit for operation in parallel with the Utility‟s system. This Agreement relates only to such Unit, but a new agreement shall not be required if the Customer makes physical alterations to the Unit that do not result in an increase in its nameplate generating capacity. The nameplate generating capacity of the Unit shall not exceed 2 MW, except for fuel cell electric generating units which shall not exceed 1.5 MW and farm waste generating units shall not exceed 1.0 MW.

I. TERM AND TERMINATION

1.1 Term: This Agreement shall become effective when executed by both Parties and shall continue in effect until terminated.

1.2 Termination: This Agreement may be terminated as follows:

a. The Customer may terminate this Agreement at any time, by giving the Utility sixty (60) days' written notice.

b. Failure by the Customer to seek final acceptance by the Utility within twelve (12) months after completion of the utility construction process described in the SIR shall automatically terminate this Agreement.

c. Either Party may, by giving the other Party at least sixty (60) days' prior written notice, terminate this Agreement in the event that the other Party is in default of any of the material terms and conditions of this Agreement. The terminating Party shall specify in the notice the basis for the termination and shall provide a reasonable opportunity to cure the default.

d. The Utility may, by giving the customer at least sixty (60) days' prior written notice, terminate this Agreement for cause. The Customer's non-compliance with an upgrade to the SIR, unless the Customer's installation is "grandfathered," shall constitute good cause.

1.3 Disconnection and Survival of Obligations: Upon termination of this Agreement the Unit will be disconnected from the Utility's electric system. The termination of this Agreement shall not relieve either Party of its liabilities and obligations, owed or continuing at the time of the termination.

1.4 Suspension: This Agreement will be suspended during any period in which the Customer is not eligible for delivery service from the Utility

II. SCOPE OF AGREEMENT

2.1 Scope of Agreement: This Agreement relates solely to the conditions under which the Utility and the Customer agree that the Unit may be interconnected to and operated in parallel with the Utility‟s system.

2.2 Electricity Not Covered: The Utility shall have no duty under this Agreement to account for, pay for, deliver, or return in kind any electricity produced by the Facility and delivered into the Utility‟s System unless the system is net metered as described in Public Service Law Sections 66-j or 66-l.

III. INSTALLATION, OPERATION AND MAINTENANCE OF UNIT

3.1 Compliance with SIR: Subject to the provisions of this Agreement, the Utility shall be required to interconnect the Unit to the Utility‟s system, for purposes of parallel operation, if the Utility accepts the Unit as in compliance with the SIR. The Customer shall have a continuing obligation to maintain and operate the Unit in compliance with the SIR.

3.2 Observation of the Unit - Construction Phase: The Utility may, in its discretion and upon reasonable notice, conduct reasonable on-site verifications during the construction of the Unit. Whenever the Utility chooses to exercise its right to conduct observations herein it shall specify to the Customer its reasons for its decision to conduct the observation. For purposes of this paragraph and paragraphs 3.3 through 3.5, the term "on-site verification" shall not include testing of the Unit, and verification tests shall not be required except as provided in paragraphs 3.3 and 3.4.

3.3 Observation of the Unit - Ten-day Period: The Utility may conduct on-site verifications of the Unit and observe the execution of verification testing within a reasonable period of time, not exceeding ten (10) business days after system installation. The applicant‟s facility will be allowed to commence parallel operation upon satisfactory completion of the verification test. The applicant must have complied with and must continue to comply with all contractual and technical requirements.

3.4 Observation of the Unit - Post-Ten-day Period: If the Utility does not perform an on-site verification of the Unit and observe the execution of verification testing within the ten-day period, the Customer will send the Utility within five (5) days of the verification testing a written notification certifying that the Unit has been installed and tested in compliance with the SIR, the utility-accepted design and the equipment manufacturer‟s instructions. The Customer may begin to produce energy upon satisfactory completion of the verification test. After receiving the verification test notification, the Utility will either issue to the Customer a formal letter of acceptance for interconnection, or may request that the applicant and utility set a date and time to conduct an on-site verification of the Unit and make reasonable inquiries of the Customer, but only for purposes of determining whether the verification tests were properly performed. The Customer shall not be required to perform the verification tests a second time, unless irregularities appear in the verification test report or there are other objective indications that the tests were not properly performed in the first instance.

3.5 Observation of the Unit - Operations: The Utility may conduct on-site verification of the operations of the Unit after it commences operations if the Utility has a reasonable basis for doing so based on its responsibility to provide continuous and reliable utility service or as authorized by the provisions of the Utility‟s Retail Electric Tariff relating to the verification of customer installations generally.

3.6 Costs of Dedicated Facilities: During the term of this Agreement, the Utility shall design, construct and install the Dedicated Facilities. The Customer shall be responsible for paying the incremental capital cost of such Dedicated Facilities attributable to the

Customer‟s Unit. All costs associated with the operation and maintenance of the Dedicated Facilities after the Unit first produces energy shall be the responsibility of the Utility.

IV. DISCONNECTION OF THE UNIT

4.1 Emergency Disconnection: The Utility may disconnect the Unit, without prior notice to the Customer (a) to eliminate conditions that constitute a potential hazard to Utility personnel or the general public; (b) if pre-emergency or emergency conditions exist on the Utility system; (c) if a hazardous condition relating to the Unit is observed by a Utility inspection; or (d) if the Customer has tampered with any protective device. The Utility shall notify the Customer of the emergency if circumstances permit.

4.2 Non-Emergency Disconnection: The Utility may disconnect the Unit, after notice to the responsible party has been provided and a reasonable time to correct, consistent with the conditions, has elapsed, if (a) the Customer has failed to make available records of verification tests and maintenance of his protective devices; (b) the Unit system interferes with Utility equipment or equipment belonging to other customers of the Utility; (c) the Unit adversely affects the quality of service of adjoining customers.

4.3 Disconnection by Customer: The Customer may disconnect the Unit at any time.

4.4 Utility Obligation to Cure Adverse Effect: If, after the Customer meets all interconnection requirements, the operations of the Utility are adversely affecting the performance of the Unit or the Customer‟s premises, the Utility shall immediately take appropriate action to eliminate the adverse effect. If the Utility determines that it needs to upgrade or reconfigure its system the Customer will not be responsible for the cost of new or additional equipment beyond the point of common coupling between the Customer and the Utility.

V. ACCESS

5.1 Access to Premises: The Utility shall have access to the disconnect switch of the Unit at all times. At reasonable hours and upon reasonable notice consistent with Section III of this Agreement, or at any time without notice in the event of an emergency (as defined in paragraph 4.1), the Utility shall have access to the Premises.

5.2 Utility and Customer Representatives: The Utility shall designate, and shall provide to the Customer, the name and telephone number of a representative or representatives who can be reached at all times to allow the Customer to report an emergency and obtain the assistance of the Utility. For the purpose of allowing access to the premises, the Customer shall provide the Utility with the name and telephone number of a person who is responsible for providing access to the Premises.

5.3 Utility Right to Access Utility-Owned Facilities and Equipment: If necessary for the purposes of this Agreement, the Customer shall allow the Utility access to the Utility‟s equipment and facilities located on the Premises. To the extent that the Customer does not

own all or any part of the property on which the Utility is required to locate its equipment or facilities to serve the Customer under this Agreement, the Customer shall secure and provide in favor of the Utility the necessary rights to obtain access to such equipment or facilities, including easements if the circumstances so require.

VI. DISPUTE RESOLUTION

6.1 Good Faith Resolution of Disputes: Each Party agrees to attempt to resolve all disputes arising hereunder promptly, equitably and in a good faith manner.

6.2 Mediation: If a dispute arises under this Agreement, and if it cannot be resolved by the Parties within ten (10) business days after written notice of the dispute, the parties agree to submit the dispute to mediation by a mutually acceptable mediator, in a mutually convenient location in New York State, in accordance with the then current CPR Institute for Dispute Resolution Mediation Procedure, or to mediation by a mediator provided by the New York Public Service Commission. The Parties agree to participate in good faith in the mediation for a period of up to 90 days. If the Parties are not successful in resolving their disputes through mediation, then the parties may refer the dispute for resolution to the New York Public Service Commission, which shall maintain continuing jurisdiction over this Agreement.

6.3 Escrow: If there are amounts in dispute of more than two thousand dollars ($2,000), the Customer shall either place such disputed amounts into an independent escrow account pending final resolution of the dispute in question, or provide to the Utility an appropriate irrevocable standby letter of credit in lieu thereof.

VII. INSURANCE

7.1 The Customer is not required to provide general liability insurance coverage as part of this Agreement, the SIR, or any other Utility requirement. Due to the risk of incurring damages however, the Public Service Commission recommends that every distributed generation customer protect itself with insurance.

7.2 Effect: The inability of the Utility to require the Customer to provide general liability insurance coverage for operation of the Unit is not a waiver of any rights the Utility may have to pursue remedies at law against the Customer to recover damages.

VIII. MISCELLANEOUS PROVISIONS

8.1 Beneficiaries: This Agreement is intended solely for the benefit of the Parties hereto, and if a Party is an agent, its principal. Nothing in this Agreement shall be construed to create any duty to, or standard of care with reference to, or any liability to, any other person.

8.2 Severability: If any provision or portion of this Agreement shall for any reason be held or adjudged to be invalid or illegal or unenforceable by any court of competent

jurisdiction, such portion or provision shall be deemed separate and independent, and the remainder of this Agreement shall remain in full force and effect.

8.3 Entire Agreement: This Agreement constitutes the entire Agreement between the Parties and supersedes all prior agreements or understandings, whether verbal or written.

8.4 Waiver: No delay or omission in the exercise of any right under this Agreement shall impair any such right or shall be taken, construed or considered as a waiver or relinquishment thereof, but any such right may be exercised from time to time and as often as may be deemed expedient. In the event that any agreement or covenant herein shall be breached and thereafter waived, such waiver shall be limited to the particular breach so waived and shall not be deemed to waive any other breach hereunder.

8.5 Applicable Law: This Agreement shall be governed by and construed in accordance with the law of the State of New York.

8.6 Amendments: This Agreement shall not be amended unless the amendment is in writing and signed by the Utility and the Customer.

8.7 Force Majeure: For purposes of this Agreement, "Force Majeure Event" means any event: (a) that is beyond the reasonable control of the affected Party; and (b) that the affected Party is unable to prevent or provide against by exercising reasonable diligence, including the following events or circumstances, but only to the extent they satisfy the preceding requirements: acts of war, public disorder, insurrection, or rebellion; floods, hurricanes, earthquakes, lightning, storms, and other natural calamities; explosions or fires; strikes, work stoppages, or labor disputes; embargoes; and sabotage. If a Force Majeure Event prevents a Party from fulfilling any obligations under this Agreement, such Party will promptly notify the other Party in writing, and will keep the other Party informed on a continuing basis of the scope and duration of the Force Majeure Event. The affected Party will specify in reasonable detail the circumstances of the Force Majeure Event, its expected duration, and the steps that the affected Party is taking to mitigate the effects of the event on its performance. The affected Party will be entitled to suspend or modify its performance of obligations under this Agreement, other than the obligation to make payments then due or becoming due under this Agreement, but only to the extent that the effect of the Force Majeure Event cannot be mitigated by the use of reasonable efforts. The affected Party will use reasonable efforts to resume its performance as soon as possible.

8.8 Assignment to Corporate Party: At any time during the term, the Customer may assign this Agreement to a corporation or other entity with limited liability, provided that the Customer obtains the consent of the Utility. Such consent will not be withheld unless the Utility can demonstrate that the corporate entity is not reasonably capable of performing the obligations of the assigning Customer under this Agreement.

8.9 Assignment to Individuals: At any time during the term, the Customer may assign this Agreement to another person, other than a corporation or other entity with limited

liability, provided that the assignee is the owner, lessee, or is otherwise responsible for the Unit.

8.10 Permits and Approvals: Customer shall obtain all environmental and other permits lawfully required by governmental authorities prior to the construction and for the operation of the Unit during the term of this Agreement.

8.11 Limitation of Liability: Neither by inspection, if any, or non-rejection, nor in any other way, does the Utility give any warranty, express or implied, as to the adequacy, safety, or other characteristics of any structures, equipment, wires, appliances or devices owned, installed or maintained by the Customer or leased by the Customer from third parties, including without limitation the Unit and any structures, equipment, wires, appliances or devices appurtenant thereto.

ACCEPTED AND AGREED:

Customer Signature: _____

Printed Name: _____

Title:_____

Date: _____

Utility Signature: _____

Printed Name: _____

Title:_____

Date: _____

APPENDIX B

NEW YORK STATE STANDARIZED APPLICATION FORATTACHMENT OF INVERTER BASED PARALLEL GENERATION EQUIPMENT TO THE ELECTRIC SYSTEM OF

Utility:_____

Customer:

Name: _____ Phone: (___)_____

Fax: (___)_____

Email: _____

Address:_____ Municipality: _____

Utility Account Number:_____ Utility Meter No.: _____

Agent (if any):

Name: _____ Phone: (___)_____

Fax: (___)_____

Email: _____

Address:_____ Municipality: _____

Consulting Engineer or Contractor:

Name: _____ Phone: (___)_____

Email:_____

Fax: (___)_____

Address:_____

_____

Existing Electric Service:

Capacity: _____Amperes Voltage: _____Volts

Service Character: ( )Single Phase ( )Three Phase

Location of Protective Interface Equipment on Property:

(include address if different from customer address)

_____

Energy Producing Inverter Information:

Total AC Nameplate Rating of All Inverters: _____

Inverter

Inverter or ,to UL 1741 (most Current version)
( )Yes ( )No; attach product literature

Manufacturer: _____ Model:_____
Quantity: ____
Rating per inverter: _____ kW
Type: ___ ( )Forced Commutated ( )Line Commutated ( ) Utility Interactive ( ) Stand Alone
Rated Output: _____Amps _____Volts
Ramp Rate:
Method of Grounding ( ) Grounded ( ) Ungrounded
Quantity of Inverters _____

If there is more than one inverter of different types or manufacturers please provide information on separate sheet.

If Applicable:

Step Up Transformer Winding Configuration: Wye-Wye ( ) Wye-Delta ( ) Delta – Wye ( )

Other existing DG such as stand-by emergency generators, other renewable technologies, microturbines, hydro, fuel cells, battery storage, etc. ( ) Yes ( ) No.

If Yes provide information about existing generation on separate sheet and include detail on one-line diagram.

Signature:

_____	_____	_____
CUSTOMER/AGENT SIGNATURE	TITLE	DATE

APPENDIX C

NEW YORK STATE STANDARIZED APPLICATION FOR ATTACHMENT OF NON-INVERTER BASED PARALLEL GENERATION EQUIPMENT TO THE ELECTRIC SYSTEM OF

Utility:_____

Customer:
Name: _____ Phone: (___)_____

Fax: (___)_____

Email: _____

Address:_____ Municipality: _____

Utility Account Number:_____ Utility Meter No.: _____

Agent (if any):
Name: _____ Phone: (___)_____

Fax: (___)_____

Email: _____

Address:_____ Municipality: _____

Consulting Engineer or Contractor:
Name: _____ Phone: (___)_____

Address:_____

_____

Estimated In-Service Date: _____

Existing Electric Service:
Capacity: _____Amperes Voltage: _____Volts
Service Character: ( )Single Phase ( )Three Phase
Secondary 3 Phase Transformer Connection ( )Wye ( )Delta

Location of Protective Interface Equipment on Property:
(include address if different from customer address)

_____

Energy Producing Equipment Information:

Manufacturer: _____
Model No. _____ Version No. _____
( )Synchronous ( )Induction ( )Other_____
Rating: _____kW Rating: _____kVA
Rated Output: ____VA Rated Voltage: ____Volts
Rate Frequency: ____Hertz Rated Speed: ____RPM
Efficiency: ____% Power Factor: ____%
Rated Current: ____Amps Locked Rotor Current: ____Amps
Synchronous Speed: ____RPM Winding Connection:
Min. Operating Freq./Time:
Generator Connection: ( )Delta ( )Wye ( )Wye Grounded
SystemTested to UL 1741 (most Current version) (Total System): ( )Yes ( )No; attach product literature
Equipment Tested to UL 1741 (most Current version) (i.e. Protection System): ( )Yes ( )No; attach product literature
Three line Diagram attached: ( )Yes
Verification Test Plan attached: ( )Yes
If applicable, Certification to UL 1741 attached: ( )Yes

For Synchronous Machines:

Submit copies of the Saturation Curve and the Vee Curve
( )Salient ( )Non-Salient
Torque: _____lb-ft Rated RPM: _____
Field Amperes: _____ at rated generator voltage and current and _____% PF over-excited
Type of Exciter: _____
Output Power of Exciter: _____
Type of Voltage Regulator: _____
Direct-axis Synchronous Reactance (X_d) _____ohms
Direct-axis Transient Reactance (X'_d) _____ohms
Direct-axis Sub-transient Reactance (X''_d) _____ohms

For Induction Machines:

Rotor Resistance (R_r)_____ohms Exciting Current ____Amps
Rotor Reactance (X_r)_____ohms Reactive Power Required:
Magnetizing Reactance (X_m)_____ohms ___VARs (No Load)
Stator Resistance (R_s)_____ohms ___VARs (Full Load)
Stator Reactance (X_s)_____ohms
Short Circuit Reactance (X''_d)_____ohms Phases:
Frame Size: _____ Design Letter: ____ ( )Single
Temp. Rise: _____ ^{O}C. ( )Three-Phase

If Applicable:

Step Up Transformer Winding Configuration: Wye-Wye ( ) Wye-Delta ( ) Delta – Wye ( )

Signature:

_____ _____ _____

CUSTOMER/AGENT SIGNATURE TITLE DATE

APPENDIX D

COST RESPONSIBILITY FOR DEDICATED TRANSFORMER(S) AND OTHER SAFETY EQUIPMENT FOR NET METERED CUSTOMERS

Generator Type	Generator Size	Equipment Cost to **Residential** Net Metered Customers	Equipment Cost to **Non-Residential** Net Metered Customers
Micro-CHP	Less than or equal to 10 kW	$350 maximum	N/A
Fuel Cell	Less than or equal to 10 kW	$350 maximum	As determined by Utility*
Fuel Cell	Over 10 kW up to 1.5 MW	N/A	As determined by Utility*
Solar	Less than or equal to 25 kW	$350 maximum	$350 maximum
Solar	Over 25 kW up to 2 MW	N/A	As determined by Utility*
Micro-hydroelectric	Less than or equal to 25 kW	$350 maximum	As determined by Utility*
Micro-hydroelectric	Over 25 kW up to 2 MW	N/A	As determined by Utility*
Wind **	Less than or equal to 25 kW	$750 maximum	$750 maximum
Wind	Over 25 kW up to 2 MW	N/A	As determined by Utility*
Farm Wind **	Over 25 kW up to 500 kW	N/A	$5,000 maximum***
Farm Waste **	Up to 1 MW	N/A	$5,000 maximum***

* Subject to review by the Commission at the request of the Customer. Such costs can include the total costs for upgrades to ensure the adequacy of the distribution system which would not have been necessary but for the interconnection of the net metered DG resource (as per PSL §66-j(3)(c)(iii) or PSL §66-l(3)(c)(iii)).

** Residential and Non-Residential Wind Customers with a total rated capacity up to 25 kW, Farm Wind and Farm Waste Customers may be required to also pay for feeder line upgrades that would not be required but for the interconnection of the net metered DG resource. Residential and Non-Residential Wind, Farm Wind and Farm Waste Customers are responsible for all feeder line upgrade costs if the total nameplate rating of the generating equipment exceeds 20% of the rated capacity of the feeder line (as per PSL §66-l(5)(c)(ii)) and PSL §66-j(5)(b)(iii)). Farm Wind Customers are responsible for 50% of feeder line upgrade costs if the total nameplate rating of the generating equipment does not exceed 20% of the rated capacity of the feeder line(as per PSL §66-l(2)).

*** For Farm Waste projects with a total nameplate rating of the generation equipment that does not exceed 20% of the rated capacity of the local feeder line to which the project will connect, the CESIR costs are included in the $5,000 limitation. For Farm Wind projects with a total nameplate rating of the generation equipment that does not exceed 20% of the rated capacity of the local feeder line to which the project will connect, that portion of the CESIR costs related to transformers or other equipment installed at the customer's site is included in the $5,000 limitation; however, the customer is also responsible for 50% of the CESIR costs related to feeder line upgrades. For Farm Waste and Farm Wind projects with a total nameplate rating of the generation equipment that does exceed 20% of the rated

capacity of the local feeder line to which the project will connect, CESIR costs related to transformers or other equipment installed at the customer's site is included in the $5,000 limitation; however, Farm Wind and Farm Waste customer are responsible for the CESIR costs related to feeder line upgrades. .