



***The Connecticut Light and  
Power Company  
and***



***The United Illuminating  
Company***

***Guidelines for Generator  
Interconnection***

***DRAFT #15 (12/15/2003)***

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## I. Introduction

Welcome! These Guidelines have been prepared by The Connecticut Light & Power Company (CL&P) and The United Illuminating Company (UI) (the “Companies”) to assist Customers wishing to generate power and to interconnect with the Electric Power System.

The Companies are responsible for the distribution of electric power throughout most of the state of Connecticut. In order to carry out their responsibilities to all Customers, the Companies must assure that any interconnections to the Electric Power System are done according to certain protocols. Those protocols and procedures are described in this Guidelines document.

The Companies have simplified the procedures. For example, for small projects (10 kW and less), the application is short and each Company pledges to complete its review within twenty business days. The Companies hope and believe that these Guidelines will be easy for our Customers to follow.

These Guidelines contemplate that the Customer and the Company will work together toward the common goal of a successful interconnection. In working together, the Companies are always willing to consider case specific exemptions to the Guidelines (e.g. advances in technology). In the unlikely event that a Customer and the Company cannot reach agreement on a specific interconnection matter, formal dispute resolution procedures are available to resolve conflicts.

We look forward to working with you to facilitate a safe, reliable and successful interconnection!

Mary Duggan  
CL&P Company Facilitator

Mike Zaffina  
UI Company Facilitator

The Company Facilitator will serve as the primary point of contact for any interconnection of Generating Facilities to the Electric Power System. Copies of these Guidelines, information and forms can be obtained from the Company Facilitator.

The Company Facilitator for CL&P can be contacted via email at [interconnections@nu.com](mailto:interconnections@nu.com), by phone at 860 665-2129 or by mail at:

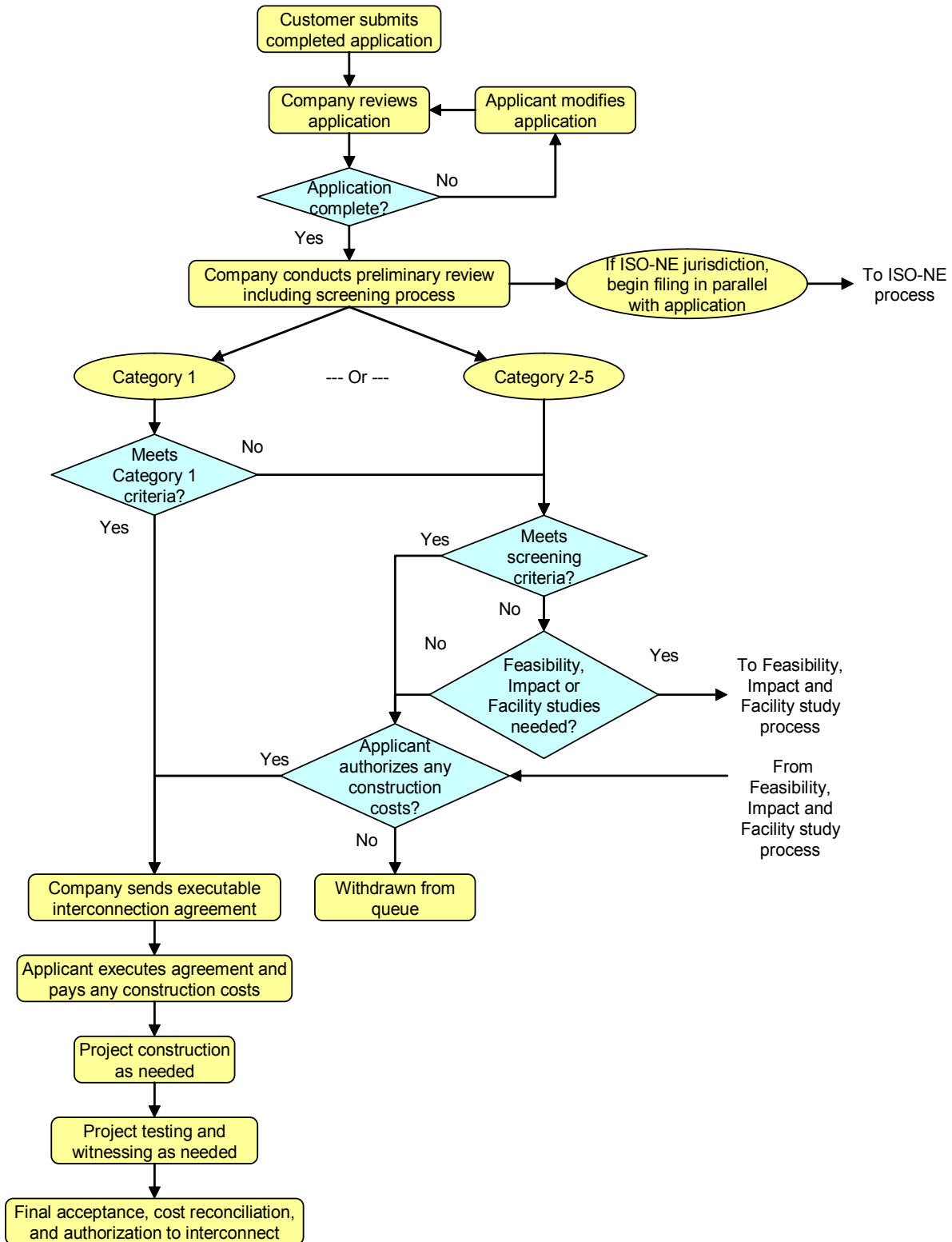
**Connecticut Light & Power  
Generator Interconnections – Asset Strategy  
NU East 2  
P. O. Box 270  
Hartford, CT 06141-0270**

The Company Facilitator for UI can be contacted via email at [mike.zaffina@uinet.com](mailto:mike.zaffina@uinet.com), or by phone at: 203 926-4615 or by mail at:

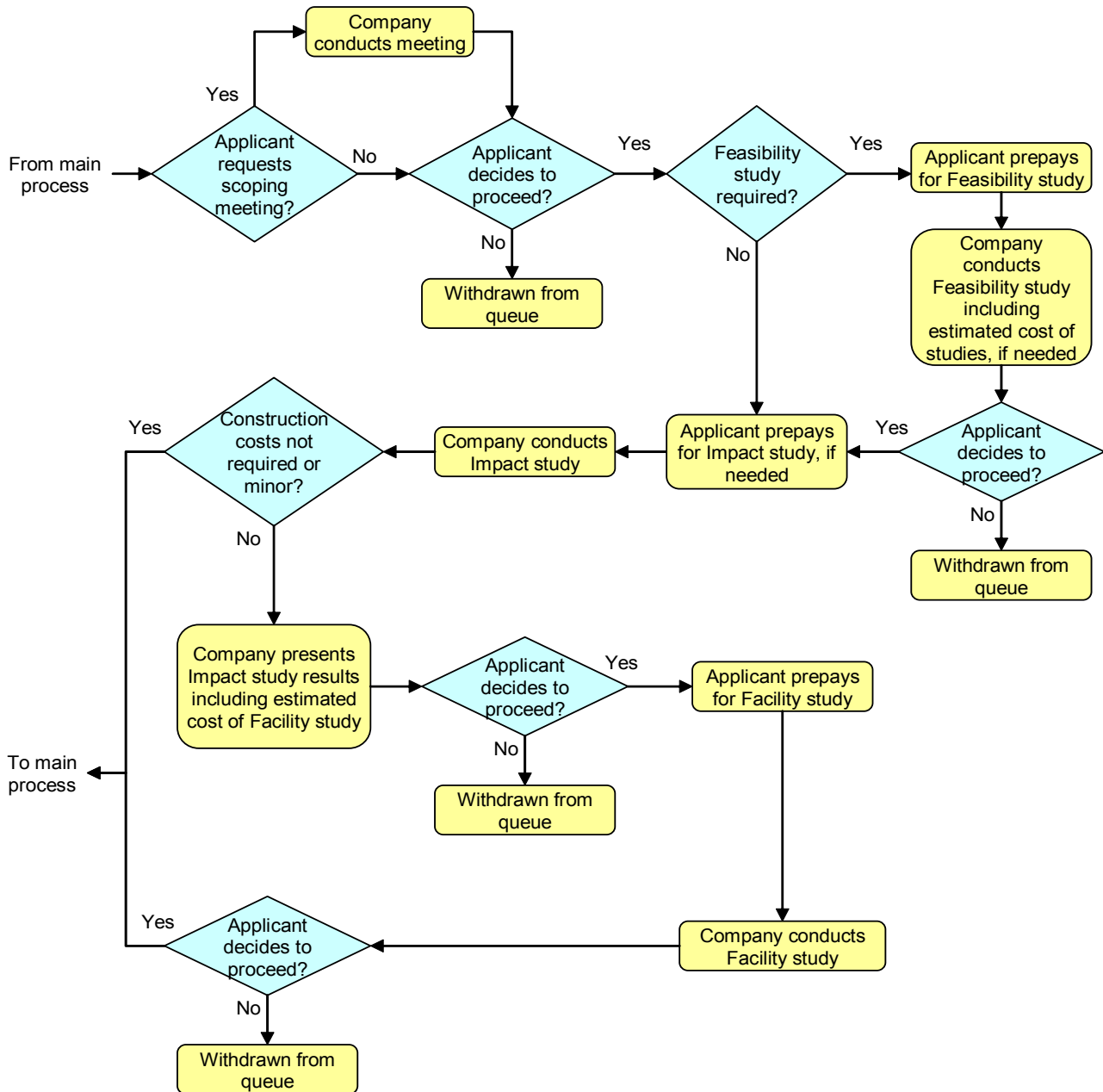
**The United Illuminating Company  
Customer Operations  
Generator Interconnection  
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Shelton, CT 06484**

## Interconnection Process Chart

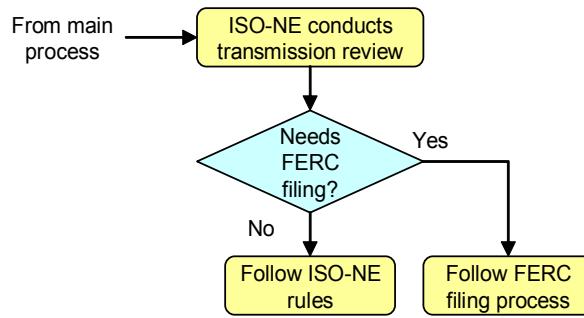
### Main Application Process



# Feasibility, Impact and Facility Study Process



## ISO-NE Process



## VOCABULARY

In this Guidelines document, the following terms may be used:

**Accredited, Nationally Recognized Testing Laboratory:** A laboratory approved to perform the certification testing required for Generating Facilities.

**ANSI:** American National Standards Institute.

**Applicant:** The person or organization applying to interconnect a Generating Facility to the Electric Power System.

**Application Review:** A review by the Company of the completed Interconnection Application Form to determine if a Feasibility, Impact and Facility Studies are needed.

**Business Day:** Shall mean Monday through Friday, excluding Federal and State Holidays.

**Calendar Day:** Shall mean any day including Saturday, Sunday, Federal and State Holidays.

**CL&P:** The Connecticut Light and Power Company. CL&P provides service to all of Connecticut except the towns supplied by UI, and the towns of Wallingford, Norwich, Bozrah and parts of Groton, Norwalk, and Lebanon.

**Company(s):** CL&P and/or UI, as appropriate.

**Company Facilitator:** The Company's designated single point of contact for customer inquiries related to Facilities. Interested parties can obtain a copy of the Guidelines, interconnection applications and any forms that are needed to request an interconnection from the Company Facilitator.

**Contract Path:** A specific contiguous electrical path from a point of receipt to a point of delivery for which Electric Power System rights have been contracted.

**DPUC:** Connecticut Department of Public Utility Control.

**Delivery Service:** The services the Company may provide to deliver capacity or energy produced by the Generator to a buyer to a delivery point(s), including related ancillary services.

**Department:** Connecticut Department of Public Utility Control ("DPUC").

**Disconnect:** To isolate a circuit or equipment from a source of power.

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

**Electric Power System (EPS):** All electrical wires, equipment, and other facilities owned or provided by the Company that are normally operated at voltages below 69kV to provide distribution service to customers.

**Facility Study:** The study conducted by the Company for Category 3, 4 & 5 Generating Facilities to determine the scope and costs of the required modifications and upgrades to the Company EPS and/or the Generating Facility to provide the requested interconnection service.

**Fault:** An equipment failure, short circuit, or other condition resulting from abnormally high amounts of current from the power source.

**Feasibility Study:** Shall mean a preliminary evaluation of the system impact and cost of interconnecting the Generating Facility to the Company's Electric Power System.

**FERC:** Federal Energy Regulatory Commission

**Generator:** The owner/operator of the Generating Facility.

**Generating Facility:** Any device producing electrical energy, i.e. rotating generators, wind, steam turbines, internal combustion engines, hydraulic turbines, solar, fuel cells, etc., including energy storage technologies. A system for the Generation of electricity that is located near the point where the electricity will be used or is in a location that will support the functioning of the electric power distribution grid.

**Good Utility Practice:** Any of the practices, methods and acts engaged in or approved by a significant portion of the electric utility industry during the relevant time period, or any of the practices, methods and acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety and expedition. Good Utility Practice is not intended to be limited to the optimum practice, method, or act to the exclusion of all others, but rather to be acceptable practices, methods, or acts generally accepted in the region.

**Guidelines:** The document prepared by CL&P and UI to describe the protocols and procedures for interconnecting to the Electric Power System, "Guidelines for Generator Interconnection".

**IEEE:** Institute of Electrical and Electronics Engineers.

**Impact Study:** An engineering study that evaluates the impact of the proposed interconnection on the safety and reliability of the Company EPS. The study shall identify and detail the system impacts that would result if the Generating Facility were interconnected without project modifications or system modifications, focusing on the Adverse System Impacts identified in the Interconnection Feasibility Study, or to study potential impacts, including but not limited to those identified in the Scoping Meeting.

**Independent System Operator (ISO):** An entity supervising the collective transmission facilities of a power region; the ISO is charged with nondiscriminatory coordination of market transactions, system-wide transmission planning, and network reliability.

**Induction Generator:** An induction machine, when driven above synchronous speed by an external source of mechanical power, used to convert mechanical power to electric power.

**In-Service Date:** The date on which the Generating Facility and system modification (if applicable) are complete and ready for service, even if the Generating Facility is not placed in service on or by that date

**Interconnection:** The physical connection of a Generating Facility to the Electric Power System so that parallel operation can occur.

**Interconnection Agreement (IA):** A written agreement between a Generator and a Company setting forth the mutual undertaking for an interconnection. An interconnection agreement is required to be signed by the Generator and Company before parallel operation of the Generating Facility can commence. Note: the Interconnection Agreement forms are attached to these Guidelines.

**Inverter:** A machine, device or system that changes direct-current power to alternating-current power.

**Islanding:** A situation where electrical power remains in a portion of an electrical power system when the Company's transmission or Electric Power System has ceased providing power for whatever reason (emergency conditions, maintenance, etc.) Islanding may be intentional, such as when certain segregated loads in a Generator's premises are provided power by a Generating Facility after being isolated from the Company Electric Power System after a power failure.

**ISO-NE:** The Independent System Operator established in accordance with the NEPOOL Agreement and applicable FERC approvals, which is responsible for managing the bulk power Generation and transmission systems in New England, or any successor organization to ISO-New England that is approved by FERC.

**Line Section:** That section of the Electric Power System between two sectionalizing devices.

**Low Voltage Secondary Network Grid System:** A Network Secondary Distribution System typically with a nominal voltage of 208Y/120 volts in which the secondaries of distribution transformers are connected to a common network bus through network protectors. The distribution transformers, network protectors and network buses are located in multiple locations which are interconnected to form a grid.

**Metering Point:** The point at which the billing meter is connected (for meters that do not use instrument transformers). For meters that use instrument transformers, the point at which the instrument transformers are connected.

**NEPOOL:** New England Power Pool.

**Net Metering:** The process, in accordance with applicable Company tariffs whereby the metered electrical energy production by a Generating Facility is subtracted from the metered Company electrical energy sales to the customer at the Generating Facility.

**Network Protector (power and distribution transformers):** An assembly comprising a circuit breaker and its complete control equipment for automatically disconnecting a transformer from a secondary network in response to predetermined electrical conditions on the primary feeder or transformer, and for connecting a transformer to a secondary network either through manual control or automatic control responsive to predetermined electrical conditions on the feeder and the secondary network.

**Network Secondary Distribution System:** A system of alternating current distribution in which the secondaries of the distribution transformers are connected to a common network for supplying light and power directly to consumer's services.

**Network Service:** Network service consists of two or more primary distribution feeders electrically connected together on the secondary (or low voltage) side to form a single power source for one or more customers.

**Non-Islanding:** Describes the ability of a Generating Facility to avoid unintentional islanding through the operation of its interconnection equipment.

**Point of Common Coupling (PCC):** The point where the Generating Facility's local electric power system connects to the Company's Electric Power System, such as the electric power revenue meter or premises service transformer.

**Point of Delivery:** See Contract Path

**Point of Interconnection:** The point where the Generating Facility is electrically connected to the Generator's electrical system.

**Point of Receipt:** See Contract Path

**Pre-certified, Pre-certification:** A specific generating and protective equipment system or systems that have been certified and documented as meeting applicable test requirements and standards relating to safety and reliability by a nationally recognized testing laboratory or, in the absence of such test requirements and standards, by tests and standards approved by the DPUC.

**Qualifying Facility (QF):** A generation facility that has received certification as a Qualifying Facility from FERC in accordance with the Federal Power Act, as amended by the 1978 Public Utilities Regulatory Policies Act ("PURPA"). The standards for a "QF" are defined in Title 18, Code of Federal Regulations, Part 292 Subpart A-General Provisions and Subpart B-Qualifying Cogeneration and Small Power Production Facilities.

**Scoping Meeting:** A scoping meeting is to discuss the interconnection application, review any existing studies relevant to the application, and discuss whether the Company should perform a Feasibility Study or proceed directly to an Impact Study, or a Facilities Study, or an Interconnection Agreement.

**Spot Network:** A small network typically with a nominal voltage of 480Y/277 volts in which the secondaries of two or more distribution transformers are connected to a common network bus through network protectors usually in a single location.

**Switchgear:** Components for switching, protecting, monitoring and controlling the Electric Power System.

**Synchronous Generator:** A synchronous alternating-current machine which transforms mechanical power into electric power. (A synchronous machine is one in which the average speed of normal operation is exactly proportional to the frequency of the system to which it is connected.)

**Telemetry:** The transmission of Generating Facility data using telecommunications techniques.

**Transfer Switch:** A switch designed so that it will disconnect the load from one power source and reconnect it to another source.

**UI:** The United Illuminating Company. UI's service area includes the principal cities of Bridgeport and New Haven and their surrounding municipalities: Ansonia, Derby, East Haven, Easton, Fairfield, Hamden, Milford, North Branford, North Haven, Orange, Shelton, Stratford, Trumbull, West Haven and Woodbridge.

**Utility Grade Relay:** A relay that is constructed to comply with, as a minimum, the most current version of the following standards; ANSI/ IEEE C37.90, ANSI/ IEEE C37.90.1, ANSI/ IEEE C37.90.2, ANSI/ IEEE C37.90.3 and; 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, and IEC 255-5 Insulation (Impulse Voltage Withstand).

## II. Application Process

### a. Definition of Generating Facility Size Categories

The following Generating Facility size categories are used in determining minimum protective requirements, commercial requirements and timeframes for Facilities. Size categories are listed according to nameplate ratings for each connection to the EPS. Generators must satisfy the general requirements and the minimum protective function requirements provided in this document for each Generating Facility category, as follows:

<b>Category*</b>	<b>Use Application Package</b>	<b>Processing Times (maximum)</b>
<b>Category 1</b> 10 kW or less Inverter based Generating Facility or Induction Generator	Attachment 1	20 business days
<b>Category 2</b> Greater than 10 kW to 100 kW and Non- Inverter based or Non-Induction 10kW or less	Attachment 2	30 business days
<b>Category 3</b> Greater than 100 kW to 1MW	Attachment 2	40 business days
<b>Category 4</b> Greater than 1 MW to 5MW	Attachment 2	120 business days
<b>Category 5</b> Greater than 5 MW	Attachment 2 and Transmission Interconnection ISO-NE/FERC Jurisdiction	Based on Complexity and Application Review

\*All Categories are based on aggregate generation at the site.

Processing time begins with the receipt of a completed application and ends with the completion of Step 7. Processing time includes Company processing time only. It does not include applicant turnaround response time or time lost as a direct result of the impact of system emergencies.

### b. Application Process for Interconnecting Category 5 Generating Facilities

In addition to the application process described in the following subsection c. Application Process for Interconnecting Category 1-5 Generating Facilities (steps 1 to 12), Category 5 Interconnections may commence with ISO-NE.

ISO-NE can be reached via regular mail at:

**Generator Interconnections  
c/o Transmission Planning  
One Sullivan Ave  
Holyoke, MA 01040**

Or via electronic mail at:

[http://www.iso-ne.com/smd/transmission\\_planning/New\\_interconnections/](http://www.iso-ne.com/smd/transmission_planning/New_interconnections/)

## **c. Application Process for Interconnecting Category 1-5 Generating Facilities**

### **Step 1 Generator Submits Application**

1. The process begins with the submission of a **completed** application to the appropriate Company. The following is required:
  - A **completed** standard interconnection application based on the category of the Generating Facility (see Table 1).
  - A one line electrical schematic drawing(s) depicting the complete proposed system design. The drawing(s) must show all electrical components and protective relaying proposed for the installation.
  - General site plan of the proposed installation.
  - Proposed schedule for the in-service date.
  - Payment of the non-refundable application fee set forth in Table 2.
  - Technical specifications for each piece of major equipment utilized in the installation.

Note that any changes to the Generating Facility described in the application, including any design changes and capacity increases, may trigger a requirement for new studies. Applicants shall obtain Company approval in writing of any modifications to the generating facility described in the application.

2. The application should be submitted to the appropriate Company Facilitator.
3. The Company will work with the Applicant to attempt to promptly resolve all disputes arising during the application process. If informal efforts do not result in a resolution of the dispute, the more formal dispute resolution procedures set forth in the interconnection agreements are applicable to disputes arising during the application process.

### **Step 2 Company Conducts Application Review**

1. The Company reviews the application materials to verify that the application is complete. If any application information is missing, the Company Facilitator will notify the Applicant within 10 business days. The Company Facilitator will work with the Applicant to identify what is needed to complete the package and will put the application "on hold" pending the receipt of the required information.

The Company will review the application material and may comment on various technical aspects, but the Company is not responsible for the correctness of the interconnection design, the drawings, or the technical specifications.

2. If the Applicant requests, following the receipt of a complete application and at a mutually agreed upon date, the Company will hold a scoping meeting with the Applicant.
3. Company conducts screening process per Attachment 3.
4. For all Category 1 applications and for Category 2 and 3 applications for which Impact and Facility Studies of the proposed Generating Facility are not required and the Applicant decides to proceed, the Applicant may skip to Step 8 of this application process.
5. If it is determined that an Interconnection Feasibility Study is required, the Company will provide an Interconnection Feasibility Study Agreement including an outline of the study and a non-binding good faith estimate of the cost to perform the study. The Applicant then provides the completed agreement to the appropriate Company Facilitator within 5 business days.
6. If the Applicant asks that the Interconnection Feasibility Study evaluate multiple potential points of interconnection, additional evaluations may need to be performed. The Applicant is responsible for the costs of these additional evaluations.

### **Step 3 Company Conducts Feasibility Study**

1. Once the application package is complete, the Company Facilitator will add the application to the queue and will notify the Applicant. An Interconnection Feasibility Study will include the following analyses for the purpose of identifying a potential adverse system impact to the EPS that would result from the interconnection:
  - a. initial identification of any short circuit capability limits exceeded as a result of the interconnection;
  - b. initial identification of any thermal overload or voltage limit violations resulting from the interconnection;
  - c. initial review of grounding requirements and system protection;
  - d. description and a non-binding estimate of the cost of facilities required to interconnect the Generating Facility to the EPS a safe and reliable manner;
  - e. other items deemed necessary on a case-by-case basis.
2. For all applications where Impact and Facility Studies are required, the following information will be provided to the Applicant by the Company Facilitator:
  - a. Scope of the Impact and Facility Study required;
  - b. Estimated cost of the Impact and Facility Study;
  - c. Estimated start date and duration of the Study;
  - d. Other necessary information required to allow completion of the Studies;
  - e. Study Authorization Agreements;
  - f. Company comments on the schedule provided.
3. Where required EPS modifications are minor, the Feasibility Study will identify those modifications.

### **Step 4 Applicant Authorizes Impact Study**

1. If an Impact Study is required and the Applicant decides to proceed, the Applicant needs to provide to the Company Facilitator:
  - Payment required by the Company for the Impact Study;
  - Signed Study Authorization Agreement; and
  - Additional study data, if required.
2. Upon receipt of the payment, study data and the signed Study Authorization Agreement, the Company will begin the Impact Study.
3. If the Company does not receive a signed Study Authorization Agreement, payment and study data within two months, the Company will put the application on hold for up to four months, after which the application will be withdrawn from the queue.

### **Step 5 Company Performs Impact Study**

1. The Company performs an Impact Study to determine the acceptability of the design of the proposed Generating Facility.
2. Upon completion of the Impact Study, the Company Facilitator will provide the Applicant with the following:
  - The results of the Impact Study.
  - Metering requirements for the proposed Generating Facility.
  - Cost estimate (plus or minus 25%) for the required additions and upgrades to the EPS.
3. The Generator shall modify the interconnection design based upon the Company's study or propose an alternative acceptable to the Company.

4. If the Impact Study determines that EPS modifications are not required and/ or may be minor, a Facility Study will not be required and the applicant may skip to step 8.

#### **Step 6 The Applicant Authorizes Electric Power System Facility Study**

1. Once an acceptable interconnection design has been settled on, the Company Facilitator will provide to the Applicant:
  - Scope of the Facilities Study required.
  - Estimated cost of the Facilities Study.
  - Estimated start date and duration of the Study.
  - Other necessary information as required to allow completion of the Study.
  - Study Authorization Agreement.
2. The Applicant needs to authorize the Company to perform the Electric Power System Facility Study by signing the Study Authorization Agreement and by submitting payment to cover the cost of the study and provide required study data.
3. If the Company does not receive authorization, required study data and payment within two months, the Company will place the application on hold for up to four months, after which the application will be withdrawn from the queue.

#### **Step 7 The Company Performs the Electric Power System Facility Study**

1. Upon receipt of the payment and the signed Study Authorization Agreement, the Company will begin the Electric Power System Facility Study.
2. Upon completion of the Facility Study, the Company Facilitator will provide the Applicant with the construction cost estimate and anticipated completion date for the required modifications to the EPS.

#### **Step 8 Applicant Executes Interconnection Agreement, Authorizes Work and Defrags Costs**

1. In this step, an agreement is developed for the construction of any required Electric Power System modifications.
2. The Applicant submits a completed Standard Interconnection Agreement to the Company as provided in the Guidelines.
3. The Applicant should return the completed and executed Standard Interconnection Agreement to the Company Facilitator.
4. The Applicant, executes a Standard Interconnection Agreement, and the construction agreement, thereby authorizing the Company to perform the work, and pays for the costs associated with the work.

#### **Step 9 Project Construction**

The Applicant and the Company construct the required interconnection facilities and Electric Power System modifications, in accordance with the design and engineering drawings, documents and the construction agreement.

#### **Step 10 The Applicant Completes Commissioning, Pre-Parallel Testing**

1. Before operating in parallel with the Electric Power System, the Generating Facilities and associated interconnection equipment must be tested to assure proper operation.
2. The Applicant should notify the Company of a proposed date for commissioning testing, including a test procedure, at least ten business days in advance of the proposed test date.
3. If significant problems arise preventing the conclusion of testing, the Company and the Applicant will schedule a mutually acceptable retest date.

The Company will charge the Applicant for the Company's personnel with expertise in this specialized area to witness the commissioning testing as prescribed in the "Protection System Testing and Maintenance" section. Charges will be made for the first and any subsequent Company visits that are required for the commissioning testing. The Applicant will be charged only for company personnel required to witness the test.

There will no be charge for Company personnel to witness the commissioning testing of Category 1 inverter-based Generating Facilities, provided that the testing is completed in one visit. If the Applicant is not ready for the testing to occur on the first Company visit, or if the testing cannot be completed or must be repeated because of a problem on the first visit, then the Company will charge the Applicant for Company personnel to witness commissioning testing on subsequent visits.

#### **Step 11 Final Acceptance, Cost Reconciliation, Authorization to Interconnect**

1. If the interconnection is not approved, the Applicant will need to take corrective action in order to obtain authorization to interconnect to the Electric Power System.
2. Prior to formal authorization of the interconnection, the Applicant will provide the Company with updated drawings and prints showing the Generating Facility as approved for normal operation. The one line drawings must be "as built" quality and include all changes that were made during construction and testing. The Applicant will provide the Company a commissioning test report (if requested) and must obtain release of municipal electrical inspector or the authority having jurisdiction.
3. When the interconnection is approved, the Company will provide a formal letter stating that the Generating Facility is allowed to commence parallel operation to the Electric Power System.
4. The Company will provide a bill for any balance due or a reimbursement for overpayment of any deposit.

### **III General Requirements**

#### **1.0 Responsibility for Costs of Interconnecting a Generating Facility**

##### **a. Fees**

During the conduct of the Feasibility Study, the Company determines the need for an Impact Study and Facility Study. The Company will provide an estimate of the cost of any required Feasibility Study, Impact Study or Facility Study. Table 2 lists the Application, Feasibility Study, Impact Study, and Facility Study fees.

<b>Table 2 Fees</b>			
<b>Category</b>	<b>Nameplate Rating*</b>	<b>Application</b>	<b>Each Study Fee</b>
Category 1	10 kW or less Generating Facility	\$100	\$0
Category 2	Greater than 10 kW to 100 kW	\$250	\$0
Category 3	Greater than 100 kW to 1MW	\$250	Actual Cost Based
Category 4	Greater than 1 MW to 5 MW	\$500	Actual Cost Based
Category 5	Greater than 5 MW	\$1000 and per ISO-NE **	Actual Cost Based

\*All Nameplate Ratings are based on aggregate generation at the site

\*\* Note: ISO-NE will maintain a generator queue for Category 5 Applicants.

### **b. Interconnection Equipment Costs**

The Applicant is responsible for all interconnection equipment costs, including installation and construction.

### **c. System Modification and Costs**

The Applicant is responsible for all associated costs incurred by the Company in designing, constructing, operating and maintaining modifications to the Electric Power System that are required to accommodate the interconnection.

Taxable Contributions In Aid of Construction (“CIAC”) will be “grossed-up” for the Company’s tax liability.

### **d. Applicant Challenge to Costs**

If an Applicant believes that the Company has charged the Applicant for costs that are not reasonable for the work performed, or costs that are not related to the Applicant’s interconnection or are not related to the Company’s costs of analysis, design and system work to accommodate the interconnection, then the Applicant may challenge such costs, provided that: (1) the Applicant has paid the Company all billed costs, including the disputed costs, in a timely manner; and (2) the Applicant provides written notice to the Company within 10 business days of the receipt of an invoice for disputed costs, specifying the disputed costs and the reasons that the Applicant believes it should not be required to pay such costs. The dispute resolution procedures under these guidelines (see Attachment 1 section 15 and, Attachment 2 Section 24) shall then be applicable to resolve the amount, if any, of the disputed costs that the Company shall return to the Applicant.

## **2.0 Agreements**

An Applicant seeking to establish an electrical interconnection with the Company must have all necessary agreements executed before parallel operation will be authorized.

The agreements an Applicant may need to complete (depending upon the size of the proposed Generating Facility) include:

1. Study Authorization Agreement(s) (Interconnection Feasibility Study, Impact Study, Electric Power System Facility Study).
2. Construction Agreement.
3. Standard Interconnection Agreement, signed by the Applicant and the Company before parallel operation can commence (required for all Generating Facilities).

If a Company line extension is required to accommodate the interconnection, the Applicant must provide suitable easements or rights of way for the extension.

### 3.0 Disconnection

#### Temporary Disconnection

- a. **Emergency Conditions.** The Interconnection Agreement contemplates that the Company and the Generator will cooperate to minimize disruptions in service. The Interconnection Agreement provides that the Company will have the right to immediately and temporarily disconnect the Generating Facility, without prior notification, in emergencies and in the cases of forced outages.
- b. **Routine Maintenance, Construction and Repair.** The Interconnection Agreement allows for the disconnection of the Generating Facility from the Electric Power System when necessary for routine maintenance, construction and repairs.
- c. **Forced Outages.** The Interconnection Agreement provides that during any forced outage, the Company shall have the right to suspend interconnection service to effect immediate repairs on the Company EPS. The Company will use reasonable efforts to provide the Generator with prior notice. Where circumstances do not permit such prior notice to the Generator, the Interconnection Agreement provides that the Company may interrupt interconnection service and disconnect the Generating Facility from the Company EPS without such notice.
- d. **Non-Emergency Adverse Operating Effects.** The Interconnection Agreement provides that the Company may disconnect the Generating Facility if the Generating Facility is having an adverse operating effect on the Electric Power System or on the Company's other customers.
- e. **Modifications of the Generating Facility.** The Interconnection Agreement provides that the Company may immediately suspend Interconnection service in cases where the Generator has implemented modifications to the Generating Facility without prior written authorization from the Company.
- f. **Re-connection.** Any curtailment, reduction or disconnection shall continue only for as long as is reasonably necessary. The Generator and the Company will cooperate to restore the Generating Facility and the Electric Power System to their normal operating states as soon as reasonably practicable following the cessation or remedy of the event or condition that led to the temporary disconnection.

#### Permanent Disconnection

- The Interconnection Agreement provides that the Generator may permanently disconnect at any time with 30 calendar days written notice to the Company.
- The Interconnection Agreement provides that the Company may permanently disconnect the Generating Facility upon termination of the Interconnection Agreement.
- The Interconnection Agreement provides that the Company may permanently disconnect the Generating Facility if the Generator is unable, after notice, to correct negative impacts on the Company's other customers or the Electric Power System caused by the Generating Facility.

### 4.0 Insurance Requirements

#### General Liability:

Generators interconnecting a Generating Facility to the EPS of the Company shall maintain liability insurance in the amounts stipulated in the following table, per interconnection, or prove financial

responsibility. If the site owner or the operator is a different party than the Generator, they shall also maintain liability insurance in the amounts stipulated in the following table. The Generator shall maintain, during the term of the Agreement, general liability insurance with a combined single limit of not less than:

<b>Table 3- Liability Insurance</b>		
<b>Category</b>	<b>Nameplate Rating*</b>	<b>Minimum Liability Insurance Required</b>
Category 1	10 kW or less Generating Facility	\$300,000
Category 2	Greater than 10 kW to 100 kW	\$300,000
Category 3	Greater than 100 kW to 1 MW	\$1,000,000
Category 4	Greater than 1 MW to 5 MW	\$2,000,000
Category 5	Greater than 5 MW	\$5,000,000

\*All Nameplate Ratings are based on aggregate generation at the site.

### **Insurer Requirements and Endorsements**

All required insurance shall be carried by reputable insurers qualified to underwrite insurance in Connecticut. In addition, all insurance shall:

- (a) include Company as an additional insured for Categories 4 & 5;
- (b) contain a severability of interest clause or cross-liability clause;
- (c) provide that Company shall not incur liability to the insurance carrier for payment of premium for such insurance; and
- (d) provide for thirty (30) calendar days' written notice to Company (Categories 4 & 5) prior to cancellation, termination, or material change of such insurance.

### **Evidence of Insurance**

Evidence of the insurance required shall state that coverage provided is primary to any insurance or self-insurance maintained by Company.

Each year, the Generator is also responsible for providing the Company with evidence of insurance in compliance with these Guidelines.

Prior to Company commencing work on system modifications, the Generator shall have its insurer furnish to Company certificates of insurance evidencing the insurance coverage required above. The Generator shall notify and send to Company Facilitator a certificate of insurance for any policy written on a "claims-made" basis. Company may at its discretion require the Generator to maintain tail coverage for three years on all policies written on a "claims-made" basis.

## **IV Technical Requirements**

### **1 General Operating Requirements**

The Generator shall operate and maintain the Generating Facility in accordance with Good Utility Practice and comply with all aspects of the Company's Guidelines for Generator Interconnection and tariffs. The Generator shall continue to comply with all applicable laws and requirements after the interconnection has commenced. In the event that the Company has reason to believe that the Generating Facility may be a source of problems on the Company EPS, the Company has the right to install monitoring equipment at a mutually agreed upon location to determine the source of the problems. If the Generator's equipment interferes with the Company's equipment and/or operations or other customers' equipment, the Generator

must immediately take corrective action to resolve the problem. If the Generator fails to take immediate action then the Company can disconnect the Generating Facility per these Guidelines. The cost of the monitoring equipment will be borne by the Company unless the problem or problems are demonstrated to be caused by the Generating Facility or if the test was performed at the request of the Generator.

**a. No Adverse Effects; Non-interference**

The Company shall notify the Generator if there is evidence that the operation of the Generating Facility could cause disruption or deterioration of service to other customers served from the same Company EPS or if operation of the Generating Facility could cause damage to the Company's EPS or affected systems. The deterioration of service could be, but is not limited to, harmonic injection in excess of IEEE STD 519, as well as voltage fluctuations caused by large step changes in loading at the Generating Facility. Each party will notify the other in a timely manner of any emergency or hazardous condition or occurrence with its equipment or facilities which could affect safe operation of the other party's equipment or facilities. Each party shall use reasonable efforts to provide the other party with advance notice of such conditions. The Generator shall take immediate action to correct interference with the Company's EPS.

The Company will operate the EPS in such a manner so as to not unreasonably interfere with the operation of the Generating Facility. The Generating Facility will protect itself from normal disturbances propagating through the Company EPS, and such normal disturbances shall not constitute unreasonable interference. Examples of such disturbances could be single-phasing events, voltage sags from faults on the Company EPS, and outages on the Company's EPS.

Islanding, on any part of the Company EPS, is to be avoided as it may result in unsafe and unreliable conditions on the Company EPS. The intent of the interconnection protection requirements is to prevent an unsafe and unreliable condition.

**b. Safe Operations and Maintenance**

Each party shall be responsible for the maintenance, repair and condition of the lines and appurtenances on its side of the PCC. The Company and the Generator shall each provide equipment on its respective side of the PCC that adequately protects the Company's EPS, personnel, and other persons from damage and injury.

**2.0 Access**

The Company shall have access to the disconnect switch of the Generating Facility at all times,

**a. Company and Generator Representatives**

Each party shall provide and update as necessary the telephone number and other applicable contact information that can be used at all times to allow the other party to report an emergency.

**b. Company Right to Access Company-Owned Facilities and Equipment**

If necessary for the purposes of these Guidelines and in the manner it describes, the Generator shall allow the Company access to Company equipment and the Company facilities located on the Generating Facility's premises. To the extent that the Generator does not own all or part of the property on which the Company is required to locate its equipment or facilities to serve the Generating Facility for the Generator shall secure and provide to the Company the necessary rights for access to such equipment or facilities, including easements.

**3.0 Metering, Monitoring, and Communication**

This Section sets forth the rules, procedures and requirements for metering, monitoring and communication between the Generator and the Company EPS and the point at which the Generator exports power or is net metered or is otherwise subject to NEPOOL requirements. The Generator will be

responsible for reasonable and necessary costs incurred by the Company for the purchase, installation, operation, maintenance, testing, repair and replacement of its metering and supervisory control and data acquisition equipment. Facility metering (and data acquisition, as required) equipment shall conform to Company rules and applicable operating requirements.

### **3.1 CL&P Metering and Related Equipment**

The Company shall furnish, read and maintain all Company revenue metering equipment and metering required for tariff administration. The Generator shall furnish and maintain all meter mounting equipment such as or including meter sockets, test switches, conduits, and enclosures. Except as provided below, the Company shall own the company revenue meter and the Generator shall pay the applicable Company tariff(s), as amended from time to time. If the Generating Facility is a Qualifying Facility ("QF"), the Generator may elect to own the meter, in which case, the Generator shall pay to the Company a monthly charge to cover meter maintenance and incremental reading and billing costs. Metering requirements and associated charges for Qualifying Facilities are set forth in the applicable Company tariff(s), as amended from time to time.

The Generator shall provide suitable space within the Generating Facility for installation of the metering, and communication equipment at no cost to the Company.

All metering equipment installed, subject to these Guidelines and associated with the Generating Facility, shall be routinely tested by the Company at the Generator's expense, in accordance with applicable Company rules and standards. If, at any time, any metering equipment is found to be inaccurate by a margin greater than that allowed under applicable criteria, rules and standards, the Company shall cause such metering equipment to be made accurate or replaced. The cost to replace the meter shall be borne by the Generator, or by the Company if owned by the Company. Meter readings for the period of inaccuracy shall be adjusted so far as the same can be reasonably ascertained; provided, however, no adjustment prior to the beginning of the preceding month shall be made except by agreement of the parties. Each party shall comply with any reasonable request of the other concerning the sealing of meters, the presence of a representative of the other party when the seals are broken and the tests are made, and other matters affecting the accuracy of the measurement of electricity delivered from the Generating Facility. If either Party believes that there has been a meter failure or stoppage, it shall immediately notify the other.

If the Metering Point and the Point of Receipt or Point of Delivery are not at the same location, the metering equipment shall record delivery of electricity in a manner that accounts for losses occurring between the Metering Point and the Point of Receipt or Point of Delivery. Losses between the Metering Point and Point of Receipt will be reflected pursuant to applicable Company, NEPOOL rules or standards.

The type of metering equipment to be installed at a Generating Facility is dependent on the size of the Generating Facility and how and if the Generator plans to export power or net meter. For those that will export power or net meter, the available equipment options and associated requirements are:

- Net Metering. "Net Metering" is an option under the terms of CL&P's Rider N Self-Generator Net Energy Billing Services for a facility whose installed generating capacity is less than 50 kilowatts for a fossil-fueled fired co-generator; or, less than 100 kilowatts for generation fueled by a renewable resource, or for residential customers who qualify under Section 16-243h of the Connecticut General Statutes. The Generating Facility will be equipped with a two-channel, electronic, solid state meter that records energy sold to the Generating Facility and energy delivered to CL&P's EPS. The netting of the meter readings during the billing process replicates the functionality of previously utilized mechanical meters that physically operated in both forward and reverse directions. All metering equipment included in this type of installation, including self-contained meters, instrument transformers and meters shall meet ANSI C12.1 Metering Accuracy Standards and ANSI C57.13 Accuracy Requirements for Instrument Transformers.
- Bi-directional, non-interval meter in which a distribution class meter with multiple registers is installed. One set of registers will record energy flows from the Company to the Generator during periods when the Generator is a net consumer. A second set of registers will record energy flows

from the Generator to the Company during periods when the Generator is a net producer of energy. Each set of registers will record total flows only and will not record flows during specific intervals. All metering equipment included in this type of installation, including self-contained meters and instrument transformers and meters, shall meet ANSI C12.1 Metering Accuracy Standards and ANSI C57.13 Accuracy Requirements for Instrument Transformers.

- The Generator must allow the Company telephone access to the meter using the Generators' telephone circuit or provide a separate telephone circuit, if needed by Company to read the meter.
- Bi-directional, interval meter with remote access – in which a distribution class meter with multiple registers is installed. One set of registers will record energy flows from the Company to the Generating Facility during periods when the Generating Facility is a net consumer of energy (the other register will record no flow during these periods). A second set of registers will record energy flows from the Generating Facility to the Company during periods when the Generating Facility is a net producer of energy (the other register will record no flow during these periods). Each set of registers will record total flows as well as flows during hourly intervals. In addition, the meters will be equipped with remote access capability that may include communication to the extent required by applicable ISO/NEPOOL standards. All metering equipment included in this type of installation shall meet the requirements contained in NEPOOL Operating Procedure No. 18, "Metering and Telemetry Criteria" and Company's "Policy and Practices for Metering and Telemetry Requirements for New or Modified Interconnections". Copies of both publications are available from the Company upon request. The Generator shall be responsible for providing all necessary leased communication (telephone, internet) lines and any necessary protection for leased lines and shall furthermore be responsible for all communication required by ISO-New England, or by ISO-New England's designated satellite. The Generator shall maintain all communication and transducer equipment at the Generating Facility in accordance with ISO-New England criteria, rules and standards. The Company will purchase, own and maintain all communication equipment located at the Facilities, if the Generator desires, at the Generator's expense. The Generator shall provide, install and own the Company-approved or Company-specified test switches in the meter and transducer circuits.

All metering equipment installed pursuant to these Guidelines and associated with the Generating Facility shall be routinely tested by the Company at the Generator's expense, in accordance with applicable Company and/or ISO-New England criteria, rules and standards.

Units over 50 kW (100 kW, if renewable): Will be equipped with a bi-directional meter. Such meter will have remote access capability and may be an interval meter.

### **3.2 UI Metering and Related Equipment**

In general, the metering requirements for customer generation are:

- For Qualifying Facilities (per UI's Rider NE), where the cumulative total nameplate of all generation at the location totals 100 kW or less, if powered by a renewable resource 50 kW or less of total nameplate generation if fossil fuel prime movers are used, the electric service shall be metered for revenue purposes primarily using two watt-hour meters with detents or, if feasible, one watt-hour meter capable of measuring bi-directional power flow. This type of metering is referred to as "Net Energy Metering". UI may choose to meter generator output, customer loads, or other quantities as necessary (For example: to monitor circuit load, load survey or VARS). The customer may be required to install metering facilities, such as meter sockets, to facilitate this metering.
- Where the cumulative total nameplate of all generation at that location is in excess of the requirements for "Net Energy Metering" but equal to or less than 1,000 kW, the electric service shall be metered for revenue purposes primarily using two watt-hour meters with detents or, if feasible, one watt-hour meter capable of measuring bi-directional power flow. UI may choose to meter generator output, customer loads, or other quantities as necessary (For example: to

monitor circuit load, load survey or VARS). The customer may be required to install metering facilities, such as meter sockets, to facilitate this metering.

- Where the cumulative total nameplate of all generation exceeds 1000 kW, bi-directional reactive power flow must also be metered in addition to the metering requirements set forth in the section above. Additionally, meters as determined by the Company, may be required to measure gross generation (Watts and VARS), and station service loads. The cost of these meters, and their installation, maintenance and operation shall be borne by the customer. For generation that exceeds 1000 kW, the metering requirements as set forth in the section below for telemetry, remote monitoring and additional metering may be required in accordance with the needs of ISO New England and NEPOOL Operating Procedures.
- Where the cumulative total nameplate of all generation exceeds 5000 kW, telemetering, remote monitoring and additional metering will be required in addition to the metering requirements set forth in the previous sections (2<sup>nd</sup> and 3<sup>rd</sup> bullets) in accordance with the needs of ISO New England. The additional requirements are defined in NEPOOL Operating Procedure No. 18 “Metering and Telemetering Criteria” and further defined in NEPOOL Operating Procedure No. 14, “Technical Requirements for Generation, Dispatchable and Interruptible Loads”. The quantities to be telemetered may include, but not be limited to the following: gross generation (Watts and VARS), tie line power flow (Watts and VARS – in and out), station service, line amps, bus voltage, circuit breaker status and generator status. These items will be determined by UI as part of the preliminary review of a specific project. The cost of these meters, telemetry equipment, communication circuits and their installation, maintenance and operation by UI shall be borne by the customer. The Generator shall be responsible for providing all necessary leased communication (telephone, internet) lines and any necessary protection for leased lines and shall furthermore be responsible for all communication required by ISO-New England, or by ISO-New England’s designated satellite or the Company. The Generator shall maintain all communication and transducer equipment at the Generation Facility in accordance with ISO-New England criteria, rules and standards. Company will purchase, own and maintain all communication equipment located at the Facilities, if the Generator desires, at the Generator’s expense. All metering equipment installed pursuant to these Guidelines and associated with the Generating Facility shall be routinely tested by the Company at the Generator’s expense, in accordance with applicable Company and/or ISO-New England criteria, rules and standards. The Generator shall provide, install and own Company-approved or Company-specified test switches in the transducer circuits.

NOTE:

- UI Standard TSM 2.4 provides details for net energy metering.
- UI Standard TSM 2.3 provides metering details for generators connected at a secondary voltage (480 volts or less).
- UI Standard TSM 2.2 covers units connected at primary distribution voltages (2.4, 4.16 or 13.8 kV).
- UI Standard TSM 2.1 provides metering details for generators connected to the transmission system (115 kV).

### **3.3 Additional Monitoring and Communication requirements**

As the amount of distributed generation on the Company EPS grows significantly, additional monitoring and communication may be required by the DPUC, ISO New England, the Company or other jurisdiction.

## **4.0 Protection Requirements for New or Modified Generating Facility Interconnections**

### **1 General Considerations**

On a typical radial EPS circuit (“feeder”) the annual peak load is measured at the substation circuit breaker, which corresponds to the supply point of the circuit. A circuit may also be supplied from a

tap on a higher-voltage line, sometimes called a sub-transmission line. On more complex radial systems, where bidirectional power flow is possible due to alternative circuit supply options (“loop service”) the normal supply point is the loop tap.

1. Any Generator desiring to interconnect with Company’s EPS or to modify an existing Interconnection must meet specifications as set out in the following standards and other requirements specified by the Company, where applicable:
  - IEEE 1547-2003 Standard for Interconnecting Distributed Resources with Electric Power Systems as adopted and successor or related IEEE-approved standards.
  - IEEE Std 929-2000 Recommended Practice for Utility Interface of Photovoltaic (PV) Systems
  - UL (Underwriters Laboratories) Std 1741, November 1, 2002, Inverters, Converters and Charge Controllers for Use in Independent Power Systems
2. The specifications and requirements listed herein are intended solely to mitigate possible adverse impacts caused by the Generating Facility to the Company’s equipment and to protect the safety of the Company’s personnel and other customers of the Company. They are not intended to address protection of the Generating Facility itself or its internal load. It is the responsibility of the Generator to comply with the requirements of all appropriate standards, codes, statutes and authorities to protect itself and its loads.
3. If requested by the Generator, the Company will provide system protection information for the line terminal(s) directly related to the interconnection. This protection information is provided exclusively for use by the Generator to evaluate protection of its Generating Facility during parallel operation.
4. The Generator shall not operate a Generating Facility that superimposes a voltage or current upon the Company system that interferes with the Company operations, service to other customers or communication facilities. If such interference occurs, the generator must take immediate corrective action, within 8 hours of being notified by the Company or first learning of the interference. If the interference cannot be corrected within 8 hours, the Company may require the Generator to cease parallel operation with the EPS. If the generator does not correct the interference or cease parallel operation when directed to do so by the Company, the Company may without liability, disconnect the Generating Facilities from Company’s system.
5. Automatic reclosing of the Company’s circuits will usually occur following tripping operations and the reclosing operation should not be limited by the Generating Facility’s interconnection. The Generator must take reclosing into consideration when designing the Generating Facility, to avoid equipment damage that may result from the Company’s circuit reclosing. Reclose-blocking relay schemes may be required to be added to Company breakers and/ or line reclosers at the Generator’s expense.
6. Generating Facility connections on the load side of a secondary grid network system (i.e., 208Y/120 volt secondary network system) are currently under consideration by IEEE 1547. Until industry standards are approved for this type of connection, none are allowed.
7. The proposed Generating Facility, in aggregate with other generation interconnected to the distribution low voltage side of the substation transformer feeding the distribution

circuit where the Small Generator proposes to interconnect, will not exceed 10 MW in an area where there are transient stability limitations to generating units located in the general electrical vicinity.

8. For interconnection of a proposed single-phase Generating Facility where the primary distribution system is three phase, four-wire, the Generating Facility will be connected line-to-neutral. For interconnection of a proposed single phase Generating Facility where the primary distribution system is three-phase, three-wire, the Generating Facility will be connected line-to-line.
9. For the interconnection of a proposed Generating Facility to any distribution secondary spot network, the Generating Facility must utilize a protective scheme that will ensure its current flow will not affect the network protective devices including reverse power flow relays or a comparable function. Synchronous Generating Facilities cannot be interconnected to a distribution secondary spot network, either for momentary or continuous operation.
10. When measured at the secondary side (low voltage) of a shared distribution transformer, the short circuit contribution of the Generating Facility must be less than or equal to 2.5% of the interrupting rating of the Company's service equipment.
11. When the proposed interconnection may result in reversed load flow through the Company's load tap changing transformer(s), line voltage regulator(s), control modifications necessary to mitigate the effects may be made to these devices by the Company at the Generator's expense or the Generating Facility may be required to limit its output so reverse load flow cannot occur or provide reverse power relaying that trips the Generating Facility.
12. Disconnect Switch (IEEE 1547-2003, Section 4.1.7). The Generator shall provide an external disconnect switch (or comparable device mutually agreed upon by the parties) at the Point of Interconnection or at Point of Common Coupling that can be opened for isolation. The switch shall be in a location easily accessible to the Company personnel at all times. The switch shall be gang operated, have a visible break when open, be rated to interrupt the maximum Generator output and be capable of being locked open by Company personnel. The visible break requirement can be met by opening the enclosure to observe the contact separation. The Company shall have the right to open the disconnect switch as required. If there is an existing Disconnect Switch at the facility, the requirement may be waived by the Company.

## **2 Protection Requirements - General**

1) The Company has adopted UL 1741 (including IEEE C62.41) for certifying the electrical protective functionality of independent power systems. UL 1741 compliance is established by UL and other Accredited, Nationally Recognized Testing Laboratories. The Company also accepts inverter-based generating facilities which are installed in multiple packs and which have been certified to UL 1741 in this configuration. The Company recognizes and accepts pre-certificated interconnecting equipment listed and maintained on the New York and California Public Utility Commission websites, and which is in compliance with UL 1741 and IEEE C62.41.

The requirements for UL 1741 may be applied to inverters with both photovoltaic and other electric energy sources, and applicable sections of UL 1741 for rotating machine equipment.

2) It is the Generator's responsibility to submit documentation that the proposed Generating Facility has been certified. Generators should contact the Generating Facility's supplier to determine if it has been listed.

3) Generating Facilities utilizing photovoltaic technology, the system must be in compliance with IEEE 929.

4) Non-certified inverters must have either non-islanding or anti-islanding protection as defined by IEEE 929 and conform to the maximum harmonic limits prescribed in IEEE 519. Non-certified inverters must be protected by certified or utility-grade relays, using settings approved by the Company.

5) Unless otherwise approved by the Company, protective relays required by these Guidelines must be either certified to UL1741 and IEEE C62.41 or be utility-grade.

6) The Generator must submit to the Company settings for all relay functions or adjustable inverters or controllers protective functions for all the Generating Facilities protective devices/functions that affect the interconnection with the Company at least four weeks prior to the scheduled date for setting the relays/inverters/controllers for review and acceptance by the Company to assure adequate protection for the Company.

### **3 Additional Requirements for Category 1 Facilities**

#### **a. Precertified Facilities**

Generating Facilities using qualified (certified to UL 1741 and in compliance with IEEE 929) inverter-based facilities or induction machine-based facilities with power ratings of 10 kW or less requesting an interconnection on radial systems where the aggregate Generating Facility capacity on the circuit is less than 5% of circuit annual peak load, qualify for Category 1 interconnection.

#### **b. Non-Precertified Facilities**

If Category 1 Generating Facilities are not using qualified inverters, the application shall be reviewed as a Category 2 Generating Facility.

### **4 Additional Requirements for Category 2-5 Facilities**

This section applies to Generating Facilities using inverters with power ratings above 10 kW and, induction and synchronous generators.

#### **a. General Requirements**

All Category 2, 3, 4 & 5 Generating Facilities must meet performance requirements set forth in relevant sections of the IEEE 1547-2003 standard and additional requirements set forth by the Company (as provided for in IEEE 1547-2003, Section 1.2, Footnote 1). Category 5 interconnections may come within the ISO-NE jurisdiction and when determined as such, shall be handled via all ISO-NE Generator Interconnection application requirements and procedures. Additional Company requirements are listed below.

**1. Voltage Regulation (IEEE 1547-2003, Section 4.1.1)**

Additional Requirement: This may also require modifications to the EPS, at the expense of the generator. The Generator shall not cause the Company EPS service voltage or other Company EPS customer's voltage, to go outside the requirements of the DPUC requirements stated in Sections 16-11-114 and 115 of the Regulations of Connecticut State Agencies.

**2. Non Export Power**

If the proposed equipment does not include a certified non-islanding function to prevent contributing to unintended islanding, Generating Facilities which do not intend to export power to the Company EPS but which may export power incidentally, must include, if applicable, a reverse power relay with a setting of 10% (export) of the aggregate generation, with a maximum 2.0 seconds time delay, unless an under power protection function is utilized to ensure a minimum import of power at the PCC. Other methods that might mitigate the islanding concern include transfer trip, protective functions to detect phase and ground faults on the EPS, reclose blocking of the EPS equipment, or other Company acceptable means.

**3. Transfer Tripping**

A direct transfer tripping system, if one is required by either the Generator or by the Company, shall use equipment generally accepted for use by the Company and shall, at the option of the Company, use dual channels.

**4. Communications Channels**

The Generator is responsible for procuring any communications channels necessary between the Generating Facility and the Company's stations and for providing protection from transients and over voltages at all ends of these communication channels. The Generator will also bear the ongoing cost to lease these communication channels. Examples include, but are not limited to, connection to a line using high-speed protection, transfer tripping, (i.e., facilities located in areas with low fault currents, or back up for Generating Facility breaker failure).

**5. Interconnection Transformers**

In order to provide maximum operating flexibility for the Generating Facility and to minimize possible adverse effects on other Company customer's facilities, a power transformer may be required between the customer's generator and the Company-owned equipment. The Company reserves the right to require connection to its EPS through a dedicated transformer, and to specify the winding connections. This transformer is usually connected in such a manner as to isolate the zero sequence circuit of the customer from the zero sequence circuit of the Company's system. The Interconnection Impact Study will determine the transformer connection and grounding configuration required. Replacement, at the customer's expense, of the Company transformer to increase insulation levels, change winding connections and lightning arrester ratings to a higher voltage may be required due to the addition of customer generation. In addition to requiring an isolation transformer, the Company may require current limiting reactors, shunt connected or in series to limit short circuit current levels.

**b. Additional Requirements for Induction and Synchronous Facilities:**

**1. Interconnection Interrupting Device**

An interconnection interrupting device such as a circuit breaker or contactor shall be installed to isolate the Generating Facility from the Company's EPS. If there is more than one interrupting device, this requirement applies to each one individually. The interconnection interrupting device must be capable of interrupting the current produced when the Generating Facility is connected out of phase.

## **2. Synchronizing Devices**

The Generator shall designate one or more synchronizing devices such as motorized breakers, contactor/breaker combinations, or a fused contactor (if mutually agreeable) to be used to connect the Generating Facility to the Company's system. This synchronizing device could be a device other than the interconnection interrupting device. The synchronizing device must be capable of interrupting the current produced when the Generating Facility is connected out of phase with the Company's system consistent with IEEE 1547-2003, Section 4.1.8.3.

All synchronizing will be done by the Generator at the Generating Facility. The Generating Facility shall not be used to energize a de-energized the Company circuit.

In-line breakers without synchronizing devices require mechanical interlocks to prevent out-of-phase closing with the Company's EPS.

Synch-check relays are not acceptable synchronizing devices.

## **3. Transformers**

The Company reserves the right to specify the winding connections for the transformer between their voltage and the Generating Facility's voltage ("Step Up Transformer") as well as whether it is to be grounded or ungrounded at the Company's voltage. The use of grounded wye connections, on the Company's side of the interconnection, will not be allowed if the Company source is ungrounded at the PCC. In the event that the transformer winding connection is grounded-wye/ grounded-wye, the Company reserves the right to specify whether the Generator stator is to be grounded or not grounded. All grounded- wye/grounded -wye transformers must be of the five legged core design to prevent overheating and may require separate neutrals. The Generator shall be responsible for procuring equipment with a level of insulation and fault withstand capability compatible with the specified grounding method.

## **4. Ungrounded Transformers**

If the Generating Facility's step up transformer winding connection is ungrounded, on the Company side of the interconnection, the Generating Facility shall be equipped with a zero sequence overvoltage relay fed from the open delta of the three phase VT specified in the Voltage Transformers and Connections section. See "Voltage Transformers and Connections" section.

The requirement for a wye grounded primary connection may necessitate the use of a three-phase interrupting device (breaker) at the primary voltage level. Depending on the system parameters, a current limiting impedance may be required in the neutral of the wye winding, along with an overcurrent ground relay.

## **5. Voltage relays**

Voltage relays shall be frequency compensated to provide a uniform response in the range of 40 to 70Hz.

In addition, voltage relays which are Utility Grade or certified and can be connected directly to the primary voltage without a VT are acceptable to the Company.

## **6. Protective Relay Hard-Wire Requirement**

Unless otherwise approved by the Company, the Company requires that protective relays be hardwired to the device they are tripping. Further, interposing computer or programmable logic controllers or the like are not permitted in the trip chain between the relay and the device being tripped. Test switches are allowed in the tripping circuit.

## **7. Protective Relay Supply**

Where protective relays are required by this protection policy, their control circuits shall be DC powered from a battery/charger system or a UPS. Solid-state relays shall be self-powered, or DC powered from a battery/charger system or a UPS. If the Generator uses a non-latching interconnection contactor accepted by the Company, AC powered relaying shall be allowed provided the relay and its method of application is fail safe. This means that if the relay fails or if the voltage and/or frequency of its AC power source deviate from the relay's design requirements for power, the relay or a separate fail-safe power monitoring relay acceptable to the Company will immediately trip the Generating Facility by opening the coil circuit of the interconnection contactor.

## **8. Current Transformers (CT)**

CT ratios and accuracy classes shall be chosen such that secondary current is less than 100 amperes and transformation errors are consistent with Company practices.

## **9. Voltage Transformers and Connections**

The Generating Facility may be required to be equipped with a direct voltage connection or a voltage transformer (VT), connected to the Company side of the interrupting device. For three phase applications, a VT for each phase is required. All three phases must be sensed either by three individual relays or by one relay that contains three elements. If the voltage on any of the three phases is outside the bounds accepted by the Company, the unit shall be tripped. If the Generating Facility's step up transformer is ungrounded at the Company voltage, this VT shall be a single three-phase device or three single-phase devices connected from each phase to ground on the Company's side of the Generating Facility's step up transformer, rated for phase-to-phase voltage. The secondary winding shall be connected in open delta, have a loading resistor to prevent ferroresonance. On one side of the relay/resistor, the connection should be grounded to enhance worker safety.

Utility-grade or certified relays, accepted by the Company, which are capable of calculating zero-sequence voltages, and which may be directly connected at the utilization voltage, may be utilized in lieu of grounded-wye to open delta VT's.

## **10. Underfrequency Load Shedding**

Existing underfrequency load shedding relay schemes on the Company distribution circuits will be reviewed by the Company to determine whether or not the scheme will operate properly with the Generating Facility installation. Changes required to the load shedding scheme to provide proper operation will be at the Generator's expense.

### **c. Additional Requirements for Induction Generators**

#### **1. Relay Functions**

Over and under voltage and over and under frequency relay functions are required. Over and under frequency relay functions are required for aggregate generators greater than 100 kW. If the Company determines that self-excitation may occur, these relay functions would also be required for generators 100 kW and below. Settings will be as specified by the Company, after review.

#### **2. Starting**

The induction generator may be connected and brought up to speed as an induction motor if it can be demonstrated that the initial voltage drop (visible flicker) is acceptable and within limits as defined by IEEE 519. When flicker occurs, outside of the IEEE 519 limits, soft starting will be required, such as speed matching to within 1% of synchronous speed or other techniques.

#### **3. VAR Support**

The VAR requirement for induction generators may be supplied from the Company's EPS. For aggregate generation of up to and including 100 kW, there will be no charge to the Generator. For aggregate generation greater than 100 kW, the Generator will be charged a one-time "capacitor charge" to cover cost of supplying the reactive current to the Generator.

The capacitor charge shall be based on 0.5 kVAR of capacitors per KW of generator nameplate capacity. The cost per kVAR of capacitors shall be Company's most recent average installed cost per kVAR.

Alternatively, the Company may require the generator to install capacitors to limit the adverse effects of drawing reactive power from the Company's EPS for excitation of the generator.

#### **d. Additional Requirements for Synchronous Facilities**

##### **1. Relay Functions**

Over and under voltage, over and under frequency, phase over current with voltage control, and either zero-sequence over voltage or neutral over current and synchronizing relay functions are required. Additional relay functions may be specified by the Company. Settings will be as specified by the Company after review.

The Generator is required to provide relaying functions to clear both phase and ground short circuit faults on the Company's distribution circuit. The operating characteristics shall be reviewed and approved by Company.

##### **2. High-Speed Protection**

The Generating Facility may be required to use high-speed protection if time-delayed protection would result in degradation in the existing sensitivity or speed of the protection systems on the Company's lines.

##### **3. Breaker Failure Protection**

The Generating Facility may be required to be equipped to provide local breaker failure protection which may include direct transfer tripping to the Company's line terminal(s) in order to detect and clear faults within the Generating Facility that cannot be detected by the Company's back-up protection.

##### **4. Power Factor**

The Generator is required to operate the Generating Facility at a relatively constant power factor during on-and off-peak hours. A power factor control capacity must be provided for each generator and it shall be capable of operating at the interconnection as such:

- CL&P, at unity power factor (at least 95% of the time). Each generator shall be capable of operating at some point within a range of a power factor of 0.90 (either leading or lagging). During system emergencies, CL&P may request the Generator to operate at power factor levels outside the stated limits. If CL&P requests that the Generator operate the Generator in a revised power factor range, provided that the Generator equipment is capable of operating within such revised ranges, CL&P will compensate the Generator for any additional expense of such revised operation.
- UI, at 1.0 power factor. For units 1 MW and larger and exporting power to the EPS, generators shall be capable of operating at 0.85 power factor supplying reactive volt-amperes (VAR's) to the EPS.

##### **5. Regulators**

The Generator must provide automatic voltage regulators for Facilities larger than 100 kW which are rated to operate at both maximum and minimum voltage levels as prescribed by the DPUC. The Generator must also consider that the EPS may reduce its voltage level an additional 5%, during times of system capacity emergency or during designated test periods.

#### **e. Protection System Testing and Maintenance**

The Company shall have the right to witness the commissioning testing (pre-parallel testing) as defined in the IEEE 1547-2003, Section 5.3. The Company must be notified ten (10) business days in advance of the testing so that it may, as its option, have company personnel observe the testing, or inspect the installation. The Generator should provide a copy of the test procedure and as-built electrical one line and relay diagram (if applicable) in advance of the test day. An individual qualified in testing protective equipment (professional engineer, factory-certified technician, or licensed electrician with experience in testing protective equipment) must perform commissioning testing in accordance with the manufacturer's recommended test procedure to prove the settings and requirements of this guideline document. At the completion of the test, the Company should receive a copy of the test report data.

Testing typically includes, but is not limited to:

- CT and CT circuit polarity, ratio, insulation, excitation, continuity and burden tests,
- VT and VT circuit polarity, ratio, insulation and continuity tests,
- Relay pick-up and time delay tests,
- Functional breaker trip tests from protective relays,
- Relay in-service test to check for proper phase rotation and magnitudes of applied currents and voltages,
- Breaker closing interlock tests, and
- Paralleling and disconnection operation.
- Anti-islanding function, if applicable.
- Non-export function, if applicable.
- Synchronizing Controls, if applicable.
- Proof of inability to energize dead lines.

Prior to final approval by the Company or anytime thereafter, the Company reserves the right to test the Generator relaying and control related to the protection of the Company's system.

The Generator has the full responsibility for the proper periodic maintenance of its Generating Facility equipment and its associated control, protective equipment and interrupting devices.

The Generator is responsible for the periodic maintenance of those relays, interrupting devices, control schemes, and batteries that involve the protection of the Company's system. The test cycle for protective relaying must not be less frequent than once every 60 calendar months or manufacturer's recommendation, whichever is less. The Generator must provide copies of these test records to the Company. The Company shall have the right to monitor the periodic maintenance performed.

The Company reserves the right to install special test equipment as may be required to monitor the operation of the Generating Facility and its control or for evaluating the quality of power produced by the Generating Facility at a mutually agreed upon location.

Each routine check shall include both a calibration check and an actual trip of the circuit breaker or contactor from the device being tested. Visually setting a calibration dial, index or tap is not considered an adequate calibration check.

Inverters with field adjustable settings for their internal protective elements shall be periodically tested if those internal elements are being used by the Generator to satisfy the requirements of this protection policy.

#### **f. Momentary Paralleling of Standby Facilities Requirements**

A closed transition scheme is not allowed on the Company's low voltage network systems or on "spot" network systems.

The closed transition scheme and transition equipment used by the Generator must be reviewed and approved by the Company, prior to operation of the generator. The closed transition scheme must provide voltage, frequency and phase angle matching as appropriate to provide a smooth transition. It must also provide maximum paralleling time protection. Once a generator starts and the generator switch/breaker closes, paralleling the generator and the Company EPS, the line switch/breaker must open within 0.5 seconds (maximum). After the utility power is restored, the scheme must open the generator switch/breaker within 0.5 seconds after the line switch is closed paralleling the generator with the Company EPS.

Protection relays to isolate the Generating Facility for faults in the Company's system are not required if the paralleling operation is automatic and takes place for less than one-half of a second. The maximum paralleling time protection must be provided by a separate device from the equipment used for control and paralleling of the generator and operation of the transfer switch. A discrete timer (60 cycles) is required, powered by the generator battery, to trip an interrupting device, which may be the generator breaker. This requirement will provide fail-safe operation should the control equipment mis-operate.

If the paralleling operation takes place at one half second or greater, the full compliment of relays required for a synchronous generator may be required by the Company.

The Generator, as a minimum, must perform the following functional tests after the transfer equipment has been energized, but before the closed-transition transfer is allowed on the Company's EPS as a normal operation:

- Voltage, frequency, and phase rotation.
- Transfer test (maximum paralleling time must not exceed 0.5 seconds)
- Excessive parallel time test (when the Company source switch fails open, the generator must be shut off and vice versa).
- The Company must be notified ten (10) working days in advance of the testing so that it may, as its option, have its personnel observe the testing, and/or inspect the installation.

Before the approval of closed-transition transfer is granted by the Company, the Generator must provide to the Company a report attesting to the successful completion of the above testing. Upon receipt of the approved test and inspection reports, and verification of the local Electrical Inspector's approval, the Company will issue a written notice of approval of closed-transition transfer to the Generator.

#### **g. Protection System Changes**

The Generator must provide the Company with reasonable advance notice of any proposed changes to be made to the protective relay system, relay settings, operating procedures or equipment that affect the interconnection. The Company will determine if such proposed changes require re-acceptance of the interconnection per the requirements of this protection policy.

In the future, should the Company implement changes to the system to which the Generating Facility is interconnected, the Generator will be responsible as its own expense for identifying and incorporating any necessary changes to its protection system. These changes to the Facilities' protection system are subject to review and approval by the Company.

#### **5 Certification of Generator Equipment Packages**

Some Generator Equipment Packages have been certified. This facilitates the interconnection since properly certified equipment need not be reviewed by the Company in as much detail as non-certified equipment. This results in a faster, less costly review process for the Generator.

An equipment package is considered certified for interconnected operation if it has been submitted, tested, and listed by a nationally recognized testing and certification laboratory for continuous utility interactive operation in compliance with the applicable codes and standards listed in Attachment 4. An equipment package shall include all interface components including switchgear, inverters, or other interface devices and may include an integrated Generating Facility. If the equipment package has been tested and listed as an integrated package which includes a Generating Facility, it shall not require further design review, testing, or additional equipment to meet the certification requirements. If the equipment package includes only the interface components (switchgear, inverters, or other interface devices), then the customer must demonstrate that the Generating Facility being utilized with the equipment package is compatible with the equipment package and consistent with the testing and listing specified for the package. Provided the Generating Facility combined with the equipment package is consistent with the testing and listing performed by the nationally recognized testing and certification laboratory, no further design review, testing, or additional equipment shall be required to meet the certification requirements. A certified equipment package does not include equipment provided by the Company, nor does certification exempt an equipment package or Generating Facility from installation testing required for commissioning and operation with the Company EPS.

**Attachment 1 Company Category 1 Standard Interconnection Application  
10 kW and less**

To submit an application to interconnect a Category 1 Generating Facility (10 kW or less, inverter-based, UL1741-listed) please fill out the attached application form down to the space for your signature. Once complete, please sign and attach any documentation provided by the Generator manufacturer describing the UL1741 listing for the Generating Facility.

**1. Generator contact information (who will be legally responsible for this Generating Facility).**

**Company:**

\_\_\_\_\_

**Representative:** \_\_\_\_\_ **Title:** \_\_\_\_\_

**Street address:**

\_\_\_\_\_

**Mailing address (if different):**

\_\_\_\_\_

**E-mail address:** \_\_\_\_\_

**Phone number:** \_\_\_\_\_ **Fax number:** \_\_\_\_\_

**Responsible party's name and contact information in case of emergency (provide day, evening and weekend contact information):** \_\_\_\_\_

**Electric Service Account Number:** \_\_\_\_\_ -

**2. Installing Electrical Contractor Information.**

**Company:**

\_\_\_\_\_

**Representative:** \_\_\_\_\_ **Title:** \_\_\_\_\_

**Street address:**

\_\_\_\_\_

**Mailing address (if different):**

\_\_\_\_\_

**E-mail address:** \_\_\_\_\_

**Telephone number:** \_\_\_\_\_ **Fax number:** \_\_\_\_\_

**3 Requested In Service Date:** \_\_\_\_\_

**4. Generating Facility /Inverter Information**

a. Manufacturer: \_\_\_\_\_

b. Model No. \_\_\_\_\_ Version No. \_\_\_\_\_ Serial No. \_\_\_\_\_

c. Generating Facility Type:

Single phase or three phase (circle one)  
Synchronous, Induction, D.C., Other \_\_\_\_\_ (circle one)

d. Nameplate AC Rating: \_\_\_\_\_ kW or: \_\_\_\_\_ kVA

e. Generating Facility /Inverter AC output voltage: \_\_\_\_\_ Volts

f. Rated current: \_\_\_\_\_ (amps)

g. Prime Mover: Photovoltaic  Reciprocating Engine  Fuel Cell  Turbine  Other \_\_\_\_\_

Energy Source: Solar  Wind  Hydro  Diesel  Natural Gas  Fuel Oil   
Other \_\_\_\_\_

h. UL1741 Listed? Yes\_ No \_\_\_\_

i. Single line diagram of interconnection and site plan.

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**5. Liability Insurance.**

Send us your certificate of liability insurance

Carrier: \_\_\_\_\_

Limits: \_\_\_\_\_

Agent Name: \_\_\_\_\_

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**6. Other Comments, Specifications and Exceptions (attach additional sheets if needed):**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**7. Generator Signature (attach manufacturer's certification of UL1741 compliance & sign here)**

I hereby certify that, to the best of my knowledge, all of the information provided in this application is true and I agree to the Terms and Conditions on the following page:

Generator Signature: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_

**Attachment 1 Company Interconnection Agreement  
Category 1 Generators-10 kW and Less**

THIS GENERATOR STANDARD INTERCONNECTION AGREEMENT (the "Agreement"), is made and entered into this \_\_\_\_ (date) day of \_\_\_\_ (month), \_\_\_\_ (year) by and between [The Connecticut Light and Power Company, a Connecticut corporation located at 107 Selden Street, Berlin, Connecticut 06037 or The United Illuminating Company, 157 Church Street, New Haven, CT 06510] (hereinafter referred to as "Company") and \_\_\_\_\_, a \_\_\_\_\_ corporation located at \_\_\_\_\_ (hereinafter referred to as "Generator"). Company and the Generator are hereinafter collectively referred to as the "Parties" and individually as a "Party".

**RECITALS**

- A. Company is the owner of the EPS in \_\_\_\_\_ ("Company's EPS").
- B. The Generator desires to install a device producing electrical energy of up to 10 kW ("Generating Facility"), including related interconnection equipment and to interconnect the Generating Facility to Company's Electric Power System (EPS).
- C. Company has previously reviewed and approved the Generator's Standard Application Form, dated \_\_\_\_\_, and supporting materials (the "Application"). The Generator has certified the information is true and correct and that the inverter is certified to UL1741.
- D. Company is willing to permit the interconnection of the Generating Facility to its EPS, subject to the terms and conditions set forth in the Application and this Agreement. The Application is attached as Exhibit 1 hereto and is incorporated into this Agreement.

**NOW THEREFORE**, in consideration of the foregoing Recitals and for other good and valuable consideration, Company and Generator agree as follows:

- 1. This Agreement solely provides for the interconnection of the Generating Facility to Company's EPS. The Generator is responsible for all arrangements to effect any deliveries of electric energy from the Generating Facility in accordance with the appropriate retail or FERC-jurisdictional tariffs. The Generator is also responsible for arranging for the provision of retail power (such as back-up or stand-by power).
- 2. **Company** "Guidelines for Generator Interconnection" are herein incorporated as part of this Interconnection Agreement. Said Generator Guidelines for Interconnection are subject to change by the Department of Public Utility Control ("DPUC"). All such changes made by the DPUC will be incorporated into this Interconnection Agreement.
- 3. **Interconnection Disconnect Switch.** The Generator shall furnish and install an interconnection disconnect switch in accordance with the Guidelines for Generator Interconnection.
- 4. **Modifications to the Generating Facility.** The Generator shall not make any modifications to the Generating Facility without prior written notice to and approval in writing by, the Company.
- 5. **Insurance.** Throughout the term of this Agreement, Generator shall carry the following insurance:
  - a. **Liability Insurance:** A liability insurance policy that provides protection against claims for damages resulting from:
    - (i) bodily injury, including wrongful death; and
    - (ii) property damage arising out of Generator's ownership and/or operation of the Generating Facility under this Agreement. The limits of such policy shall be at least three hundred thousand dollars (\$300,000) per occurrence and in the aggregate for bodily injury and/or

property damage claims where the gross nameplate rating of the Generating Facility is 10 kW or less. The failure of the Generator or the Company to enforce the minimum levels of insurance does not relieve the Generator from maintaining such levels of insurance or relieve Generator of any liability.

- b. Certificates of Insurance. Generator shall also provide annual certification to the appropriate Company Facilitator.
- 6. Indemnification of the Company.** The Generator shall indemnify, defend and hold Company and its trustees, directors, officers, employees and agents (including, but not limited to, affiliates and contractors and their employees), harmless from and against all liabilities, damages, losses, penalties, claims, demands, suits and proceedings of any nature whatsoever for personal injury (including death) or property damages to unaffiliated third parties that arise out of or are in any manner connected with performance or non-performance under this Agreement.
- 7. Indemnification of Generator.** Company agrees to indemnify, defend and hold harmless the Generator, its directors, officers, employees and agents (including, but not limited to, affiliates, contractors and their employees), from and against any and all damages for personal injury (including death) or property damage arising from any and all actions relating to or arising out of any material failure of the Company to observe or perform any term or provision of this Interconnection Agreement which it is the Company's obligation to observe or perform.
- 8. Limitation of Liability.** Each Party's liability to the other Party for any loss, cost, claim, injury, liability, or expense, including court costs and reasonable attorney's fees, relating to or arising from any act or omission in its performance of this Agreement, shall be limited to the amount of direct damage or liability actually incurred. In no event shall either Party be liable to the other Party for any indirect, incidental, special, consequential, or punitive damages of any kind whatsoever.
- 9. Generating Facility Commissioning Testing.** The Generator shall notify Company in writing that installation of the Generating Facility is complete and that the interconnection equipment is available for testing by Company at least 10 business days before the Generating Facility interconnects with Company's EPS. Company shall thereupon have the right to test the Generating Facility and shall have the right to witness any testing of the Generating Facility.
- 10. Access to the Generating Facility.** The Generator shall permit Company's employees and agents to enter the property on which the Generating Facility is located at any reasonable time for the purposes of inspecting and/or testing the Generating Facility to insure its continued safe and satisfactory operation. Such inspections shall not relieve the Generator from its obligation to maintain the Generating Facility and any related equipment owned by Generator in safe and satisfactory operating condition. Company shall have the right to witness any testing by Generator of the Generating Facility.
- 11. Disconnection of a Generating Facility to Permit Maintenance and Repairs.** Upon not less than (7) seven business days written prior notice by Company, Generator shall disconnect the Generating Facility to permit Company to perform routine repairs and maintenance to Company's EPS, or to install modifications thereto. If the Generator disconnects the Generating Facility permanently, then the Generator must submit a written notice to that effect, to the Company Facilitator.
- 12. Term of Agreement.** This Agreement shall become effective immediately upon execution by all parties and shall continue in effect until terminated by any of the following:
  - a. mutual written agreement of the Parties to terminate;
  - b. permanent disconnection, abandonment or removal of the Generating Facility by Generator; If Generator disconnects permanently, it should provide Company with 7 business days prior written notice.
  - c. bankruptcy or failure to make payment of any costs hereunder;
  - d. failure to maintain the Generating Facility in a manner that prevents disruption to Company's system.

- e. an order of a state or federal authority requiring Generator to permanently disconnect or shutdown the Generating Facility.
- f. the Generator modifies the Generating Facility or any part of the interconnection without the prior written approval of the Company.

**13. Assignment.** Except as provided herein, Generator shall not voluntarily assign its rights or obligations, in whole or in part, under this Agreement without Company's written consent. Any assignment Generator purports to make without Company's written consent shall not be valid. Company shall not unreasonably withhold or delay its consent to Generator's assignment of this Agreement. Notwithstanding the above, Company's consent will not be required for any assignment made by Generator to an Affiliate or as collateral security in connection with a financing transaction. In all events, the Generator will not be relieved of its obligations under this Agreement unless, and until the assignee assumes in writing all obligations of this Agreement and notifies Company of such assumption.

**14.** Upon 30 days notice, Company may terminate this Agreement if there are any changes in DPUC regulations or state or federal laws that affect the Company's ability to perform its obligations under this contract.

**15. Force Majeure**

- a. For purposes of this Agreement, "Force Majeure Event" means any event that is beyond the reasonable control of the affected Party; and that the affected Party is unable to prevent or provide against by exercising commercially reasonable efforts, including the following events or circumstances, but only to the extent they satisfy the preceding requirements: acts of war or terrorism, public disorder, insurrection, or rebellion; floods, hurricanes, earthquakes, lightning, storms, and other natural calamities; explosions or fire; strikes, work stoppages, or labor disputes; embargoes; and sabotage.
- b. 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. In no event will the unavailability or inability to obtain funds constitute a Force Majeure Event. Without limiting this section, the Generator will immediately notify the Company verbally if the failure to fulfill the Generator's obligations under this Agreement may impact the safety or reliability of the Electric Power System.

**16. Governing Law, Jurisdiction of the DPUC, Inclusion of Company's Tariffs and Rules**

- 1. This Agreement shall be interpreted, governed, and construed under the laws of the State of Connecticut as if executed and to be performed wholly within the State of Connecticut without giving effect to choice of law provisions that might apply the law of a different jurisdiction.
- 2. This Agreement shall, at all times, be subject to such changes or modifications by the DPUC as it may from time to time direct in the exercise of its jurisdiction.
- 3. The interconnection and services provided under this Agreement shall at all times be subject to the terms and conditions set forth in the tariff schedules and rules applicable to the electric service provided by Company, which tariff schedules and rules are hereby incorporated into this Agreement by this reference.

4. Notwithstanding any other provisions of this Agreement, Company shall have the right to unilaterally file with the DPUC, pursuant to the DPUC's rules and regulations, an application for change in rates, charges, classification, service, tariff or rule or any agreement relating thereto.

**17. Continuation of Indemnifications.** The indemnification obligations of each Party shall continue in full force and effect regardless of whether this Interconnection Agreement has expired or been terminated, defaulted or cancelled and shall not be limited in any way by any limitation on insurance.

**18. Dispute Resolution Procedures**

Each Party shall agree to attempt to resolve all disputes promptly, equitably and in a good faith manner. If Parties are unable to informally resolve their dispute, the following formal three step dispute resolution process must be followed:

- a. **Negotiation**  
Upon receipt of written request for formal dispute resolution, the Parties shall negotiate in good faith for 8 business days in an attempt to resolve the disputed issues. The Step One negotiation will take place between appropriate representatives of each Party. An appropriate representative is a vice-president or a member of senior management with sufficient authority to resolve the dispute. Extensions are possible if mutually agreed to.
- b. **Mediation**  
If the Parties have not resolved the dispute through Step One negotiation, the Parties agree to attempt to resolve their dispute through non-binding mediation. The Parties shall agree to a mutually agreeable mediation process and mediator. Each party will select a mediator within 5 business days and the two selected mediators will attempt to, within 5 business days, select a third, mutually agreeable mediator. The parties shall share the cost of mediation equally. Once the three mediators are selected and the mediation commences, the Parties agree to engage in mediation in good faith for a period of not less than 30 calendar days.
- c. **Department of Public Utility Control**  
If the Parties cannot resolve their dispute through Step Two Mediation within 30 calendar days, either Party may commence an action at the Department of Public Utility Control for resolution of the dispute.

All timeframes in this process and the Dispute Resolution Process itself may be modified by mutual agreement of the Parties.

IN WITNESS WHEREOF, Generator and Company has executed this Agreement as of the year and date first set forth above.

[Generator]:

\_\_\_\_\_  
By:  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

(Additional Generator signatory blocks may be added as needed)

The Company:

\_\_\_\_\_  
By:  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

**Attachment 2 Company Category 2 -5 Standard Interconnection Application**

If you wish to submit an application for interconnection please fill out all information requested below:

**1. Generating Facility contact information (where the Generating Facility will be installed).**

Company:

Representative: \_\_\_\_\_ Title: \_\_\_\_\_

Street address: \_\_\_\_\_

Mailing address (if different): \_\_\_\_\_

E-mail address: \_\_\_\_\_

Phone number: \_\_\_\_\_ Fax number: \_\_\_\_\_

**2. Generator contact information (who will be legally responsible for this Generating Facility).**

Company:

Representative: \_\_\_\_\_ Title: \_\_\_\_\_

Street address: \_\_\_\_\_

Mailing address (if different): \_\_\_\_\_

E-mail address: \_\_\_\_\_

Phone number: \_\_\_\_\_ Fax number: \_\_\_\_\_

Responsible party's name and contact information in case of emergency (provide day, evening and weekend contact information): \_\_\_\_\_

**3. Project Design / Engineering.**

Company:

Representative: \_\_\_\_\_ Title: \_\_\_\_\_

Street address: \_\_\_\_\_

Mailing address (if different): \_\_\_\_\_

E-mail address: \_\_\_\_\_

Phone number: \_\_\_\_\_ Fax number: \_\_\_\_\_

**4. Electrical Contractor.**

**Company:**

**Representative:** \_\_\_\_\_ **Title:** \_\_\_\_\_

**Street address:** \_\_\_\_\_

**Mailing address (if different):** \_\_\_\_\_

**E-mail address:** \_\_\_\_\_

**Telephone number:** \_\_\_\_\_ **Fax number:** \_\_\_\_\_

**5. Generator's ownership of the Generation system:**

**Owner, Co-owner, Lease, Rental, Other \_\_\_\_\_ (circle one)**

**6. Primary intent of the Generation system:**

**Onsite use of power, Commercial power, Sales to a third party (circle one)**

**If onsite use of power, please describe the mode of operation:**

**Peak shaving / Demand management, Primary power / Base load,  
Combined heat and power or Cogeneration, Stand by/ Emergency / Back up,**

**Will it vary by season? (please describe) \_\_\_\_\_**

**7. Estimated Construction start and completion dates:**

**Start date:** \_\_\_\_\_

**Target in service date:** \_\_\_\_\_

**8. Technical Specifications (attach additional sheets if needed).**

**a. Provide one-line schematic diagram of the system:**

**b. Site Plan: showing major equipment, electric service entrance, electric meter, location of the Generating Facility and interface equipment, location of disconnect switch, adjoining street name, and street address of Generating Facility.**

**9. Generator (complete for each rotating Generator ).**

**Note: for Wind Generators, a completed Electric Power Systems load flow data sheet must be supplied with the application.**

**a. Manufacturer:** \_\_\_\_\_

**b. Model No.** \_\_\_\_\_ **Version No.** \_\_\_\_\_ **Serial No.** \_\_\_\_\_

**c. Generation Type:**

Single phase or three phase (circle one)  
Synchronous, Induction, Inverter, Other \_\_\_\_\_ (circle one)

- d. Rating: \_\_\_\_\_ kW at \_\_\_\_\_ power factor; or rating: \_\_\_\_\_ kVA
- e. Generating Facility output voltage: \_\_\_\_\_ Volts
- f. Generating Facility terminal voltage: \_\_\_\_\_ Volts
- g. Rated current: \_\_\_\_\_ (amps)
- h. Frequency: \_\_\_\_\_ (Hz)
- i. Rated power factor: \_\_\_\_\_ (%)
- j. Power factor adjustment range: \_\_\_\_ min., \_\_\_\_ max. \_\_\_\_
- k. If three-phase, winding configuration: 3 wire delta, 3 wire wye, or 4 wire wye
- l. Neutral grounding system used: Ungrounded, solidly grounded, ground resistor or reactor \_\_\_\_\_ (ohms)

m. For synchronous Generators: synchronous reactance ( $X_d$  %) \_\_\_\_\_, transient reactance ( $X'_d$  %) \_\_\_\_\_, and sub-transient reactance: ( $X''_d$  %) \_\_\_\_\_, zero sequence reactance ( $X_0$ ), negative sequence reactance ( $X_2$ ), or for induction Generators: Locked rotor current \_\_\_\_\_ (amps) or stator resistance \_\_\_\_\_ (%), stator leakage resistance \_\_\_\_\_ (%), rotor resistance \_\_\_\_\_ (%), and rotor leakage resistance \_\_\_\_\_ (%)

n. Prime mover energy source (i.e., natural gas, steam, wind, sun, etc.): \_\_\_\_\_

(Note, if there is more than one Generating Facility and/or inverter, attach an additional sheet describing each).

o. RPM \_\_\_\_\_

10. Interface Equipment (complete for each rotating Generator).

a. Synchronizer for synchronous Generator:

Manufacturer \_\_\_\_\_

Model Number \_\_\_\_\_

Automatic or manual synchronizer \_\_\_\_\_

b. Inverter for DC Generator:

Manufacturer \_\_\_\_\_

Model Number \_\_\_\_\_

Line or Self Commutated Inverter \_\_\_\_\_

11. Static Inverter (complete for DC to AC inverters).

a. Manufacturer \_\_\_\_\_

b. Model Number \_\_\_\_\_

c. Terminal Voltage \_\_\_\_\_

d. Single, Split, or Three Phase \_\_\_\_\_

e. kW \_\_\_\_\_

f. No. of Units \_\_\_\_\_

g. Frequency \_\_\_\_\_

h. Power Factor \_\_\_\_\_

i. Line or Self Commutated \_\_\_\_\_

j. Battery Back Up? \_\_\_\_\_

k. Total System kW Output \_\_\_\_\_

l. Energy of Fuel Source \_\_\_\_\_

**12. Protection Equipment – Including relays, if applicable (attach additional sheet(s) if necessary).**

a. Manufacturer's Name, Model and Catalog Number for each Protective Device

\_\_\_\_\_  
\_\_\_\_\_

b. Range of Available Settings for each Protective Device

\_\_\_\_\_  
\_\_\_\_\_

c. Proposed Settings (trip setpoint and time) for each Protective Device

\_\_\_\_\_  
\_\_\_\_\_

d. Current Transformer Data (if applicable)

Manufacturer:            Type:            Accuracy class:            Proposed ratio

connection:

Manufacturer:            Type:            Accuracy class:            Proposed ratio

connection:

e. Potential Transformer Data (if applicable)

Manufacturer:            Type:            Accuracy class:            Proposed ratio

connection:

Manufacturer:            Type:            Accuracy class:            Proposed ratio

connection:

**13. Short circuit interrupting rating of interconnection disconnection device:**

\_\_\_\_\_ (amps) symmetrical, \_\_\_\_\_ (amps) asymmetrical.

**14. Does the Generating Facility start with the aid of grid power (i.e., motoring)?**

Yes, No

If yes, what is the load current? \_\_\_\_\_ (amps), inrush current? \_\_\_\_\_ (amps).

**15. Interconnection Transformer**

Please describe: Manufacturer \_\_\_\_\_, Model \_\_\_\_\_, \_\_\_\_\_ (rating KVA), \_\_\_\_\_ (primary volts), \_\_\_\_\_ (secondary volts), \_\_\_\_\_ impedance and losses \_\_\_\_\_

Type of transformer winding connections: \_\_\_\_\_

**16. Liability Insurance.**

Carrier: \_\_\_\_\_

Limits: \_\_\_\_\_

Agent Name: \_\_\_\_\_

**17. Generator and Project Design / Engineering Signature**

To the best of my knowledge, all the information provided in this Standard Application Form is true and correct.

Generator: \_\_\_\_\_ Date: \_\_\_\_\_  
(signature)

Project Design / Engineering: \_\_\_\_\_ Date: \_\_\_\_\_  
(signature)

## **Attachment 2 – Company Category 2 -5 Standard Interconnection Agreement**

1. This Interconnection Agreement (“Agreement”), dated as of \_\_\_\_\_ (“Effective Date”) is entered into by and between [Connecticut Light and Power, a Connecticut corporation with a principal place of business at 107 Selden St, Berlin, CT, 06037 or The United Illuminating Company, 157 Church Street, New Haven, CT 06510] (hereinafter referred to as the “Company”), and \_\_\_\_\_, a \_\_\_\_\_ corporation with a principal place of business at \_\_\_\_\_ (“Generator”). (Company and Generator are collectively referred to as the “Parties” and individually as a “Party”).
2. **Basic Understandings.** This Agreement provides for parallel operation with the Company EPS of a Generating Facility to be installed and operated by the Generator at \_\_\_\_\_ (address of Generating Facility, and end-use customer account number). A description of the Generating Facility as studied, and incorporating any Company-approved modifications, is attached hereto.

This Agreement solely provides for the interconnection of the Generating Facility to Company’s EPS. The Generator is responsible for all arrangements to effect any deliveries of electric energy from the Generating Facility in accordance with the appropriate retail or FERC-jurisdictional tariffs. The Generator is also responsible for arranging for the provision of retail power (such as back-up or stand-by power).

Any changes to the design of the Generating Facility as it is depicted and specified in the application must be approved by the Company in writing in advance of the construction of those design changes. Only such Company-approved modifications to the Generating Facility will be made during construction. The Generator may not operate its Generating Facility in parallel with the Company EPS until commissioning and testing has been completed to the satisfaction of the Company and the Company has provided formal authorization in the form of a written document stating that operating in parallel is authorized by the Company (“Authorization Date”). The written authorization will not be effective unless accompanied by a description of the Generating Facility that incorporates all changes made to the design of the Generating Facility since the application was filed, including all changes made during construction.

3. **Entire Agreement.** This Agreement, including any attachments or appendices, is entered into pursuant to the Generator Guidelines for Interconnection. Together this Agreement and the “Guidelines for Generator Interconnection” represent the entire understanding between the Parties, their agents, and employees as to the subject matter of this Agreement. Each Party also represents that in entering into this Agreement, it has not relied on any promise, inducement, representation, warranty, agreement or other statement not set forth in this Agreement or in relevant tariffs or the Guidelines for Generator Interconnection.
4. **Term.** This Agreement is effective as of the Effective Date. The Agreement shall continue, in full force and effect until terminated pursuant to Section 5 of this Agreement.
5. **Termination.**
  - 5.1 This Agreement may be terminated under the following conditions:
    - 5.1.1 The Parties agree in writing to terminate the Agreement.
    - 5.1.2 The Generator may terminate this agreement at any time by providing sixty (60) calendar days written notice to Company.
    - 5.1.3 Company may terminate this Agreement upon the occurrence of an Event of Default by the Generator as provided in this Agreement.

5.1.4 Company may terminate this Agreement if the Generator either: (i) operates the Generating Facility in parallel with the Company EPS prior to the Authorization Date; (ii) fails within six months of initial testing to receive authorization to operate in parallel with the Company EPS; (iii) does not construct the Generating Facility in accordance with the description attached hereto; (iv) is discovered at any time to have modified the Generating Facility without the written approval of the Company; (v) fails to energize the Generating Facility within twelve months of the Authorization Date; or, (vi) permanently abandons the Generating Facility. Failure to operate the Generating Facility for any consecutive twelve month period after the Authorization Date shall constitute permanent abandonment.

5.2 Survival of Obligations. The termination of this Agreement shall not relieve either Party of its liabilities and obligations, owed or continuing at the time of termination.

5.3 Related Agreements. Any agreement attached to and incorporated into this Agreement shall terminate concurrently with this Agreement unless the Parties have agreed otherwise in writing.

## **6. General Payment Terms**

6.1 The Generator shall be responsible for the system modification costs and payment terms identified in this Agreement and any approved cost increases pursuant to the terms of the "Guidelines for Generator Interconnection".

6.2 Final Accounting. Upon request by the Generator, Company within ninety (90) calendar days after completion of the construction, installation and testing of the system modification described in an attached exhibit to the Interconnection Agreement, shall provide Generator with a final accounting report. To the extent that Generator's cost responsibility exceeds Generator's previous aggregate payments, Company shall invoice Generator and Generator shall make payment to Company within calendar 45 days. To the extent that Generator's previous aggregate payments exceed Generator's cost responsibility under this agreement, Company shall refund to Generator an amount equal to the difference within forty five (45) calendar days of the provision of such final accounting report.

## **7. Operating Requirements**

### **7.1 General Operating Requirements**

The Generator shall operate and maintain the Generating Facility in accordance with Good Utility Practice and comply with all aspects of the Company's Guidelines for Generator Interconnection and tariffs. The Generator shall continue to comply with all applicable laws and requirements after the interconnection has commenced. In the event that the Company has reason to believe that the Generating Facility may be a source of problems on the Company EPS, the Company has the right to install monitoring equipment at a mutually agreed upon location to determine the source of the problems. If the Generator's equipment interferes with the Company's equipment and/or operations or other customers' equipment, the Generator must immediately take corrective action to resolve the problem. If the Generator fails to take immediate action then the Company can disconnect the Generating Facility per these Guidelines. The cost of the monitoring equipment will be borne by the Company unless the problem or problems are demonstrated to be caused by the Generating Facility or if the test was performed at the request of the Generator

### **7.2 No Adverse Effects; Non-interference**

The Company shall notify the Generator if there is evidence that the operation of the Generating Facility could cause disruption or deterioration of service to other customers served from the same Company EPS or if operation of the Generator could cause damage to Company's EPS or

affected systems. The deterioration of service could be, but is not limited to, harmonic injection in excess of IEEE STD519, as well as voltage fluctuations caused by large step changes in loading at the Generating Facility. Each Party will notify the other of any emergency or hazardous condition or occurrence with its equipment or facilities which could affect the operation of the other Party's equipment or facilities. Each Party shall use reasonable efforts to provide the other Party with advance notice of such conditions.

The Company will operate the EPS in such a manner so as to not unreasonably interfere with the operation of the Generating Facility. The Generator will protect itself from normal disturbances propagating through the Company EPS. Examples of such disturbances could be, but are not limited to, single-phasing events, voltage sags from remote faults on the Company's EPS, and outages on the Company's EPS.

### **7.3 Safe Operations and Maintenance**

7.3.1 General - Each Party shall operate, maintain, repair, and inspect, and shall be fully responsible for, the Generating Facility or facilities that it now or hereafter may own unless otherwise specified in this Agreement. Each Party shall be responsible for the maintenance, repair and condition of its respective lines and appurtenances on that Party's respective side of the PCC. The Company and the Generator shall each provide equipment on its respective side of the PCC that adequately protects the Company's EPS, personnel, and other persons from damage and injury. If the Company has constructed or owns facilities that are identified at the time of Interconnection as specifically required by or as a result of the interconnection, the Generator will be required to pay for the Company's costs of maintaining and repairing those facilities.

7.3.2 Ongoing Maintenance – Testing of Generating Facilities. Maintenance testing of the protective relaying is imperative for safe, reliable operation. The test cycle for protective relaying must not be less frequent than once every 60 calendar months or manufacturer's recommendation, whichever is more frequent. The Generator must provide copies of these test records to the Company. Failure to adhere to these guidelines may be sufficient cause to require Generating Facility to be disconnected from the Company's Electric Power System.

### **7.4 Access**

#### **7.4.1. The Company and Generator Representatives**

Each Party shall provide and update as necessary the telephone number that can be used at all times to allow either Party to report an emergency.

#### **7.4.2 Company Right to Access Company-Owned Facilities and Equipment**

The Generator shall allow the Company access to Company equipment and the Company facilities located on the Generating Facility's premises. To the extent that the Generator does not own all or part of the property on which the Company is required to locate its equipment or facilities to serve the Generating Facility for the Generator shall secure and provide to the Company the necessary rights for access to such equipment or facilities, including easements.

#### **7.4.3 Disconnect Switch**

**The Company shall have access to the disconnect switch of the Generating Facility at all times.**

#### **7.4.4 Right to Review Information**

The Company shall have the right to review and obtain copies of Generator's operations and maintenance records, logs, or other information such as unit availability, maintenance outages, circuit breaker operation requiring manual reset, relay targets and unusual events pertaining to the Generator's Generating Facility or its interconnection with the Company EPS. This information will be treated as customer-confidential and used only for the purposes of determining compliance with the Operating Requirements.

## 8. Disconnection

### 8.1 Temporary Disconnection

- 8.1.1 Emergency Conditions.** The Company shall have the right to immediately and temporarily disconnect the Generating Facility without prior notification in cases where, in the reasonable judgment of the Company, continuance of such service to the Generating Facility is imminently likely to (i) endanger persons or damage property or (ii) cause a material adverse effect on the integrity or security of, or damage to, the Company EPS or to the electric systems of others to which the Company EPS is directly connected. The Generator shall notify the Company promptly when it becomes aware of an emergency condition that affects the Generator that may reasonably be expected to affect the Company EPS. To the extent information is known, the notification shall describe the emergency condition, the extent of the damage or deficiency, or the expected effect on the operation of both Parties' facilities and operations, its anticipated duration and the necessary corrective action.
- 8.1.2 Routine Maintenance, Construction and Repair.** The Company shall have the right to disconnect the Generating Facility from the Company EPS when necessary for routine maintenance, construction and repairs on the Company EPS. The Company shall provide the Generator with a minimum of seven calendar days planned outage notification consistent with the Company's planned outage notification protocols. If the Generator requests disconnection by the Company at the PCC, the Generator will provide a minimum of seven days notice to the Company. The Company shall make an effort to schedule such curtailment or temporary disconnection with Generator.
- 8.1.3 Forced Outages.** During any forced outage, the Company shall have the right to suspend interconnection service to effect immediate repairs on the Company EPS. The Company shall use reasonable efforts to provide the Generator with prior notice. Where circumstances do not permit such prior notice to the Generator, the Company may interrupt interconnection service and disconnect the Generating Facility from the Company EPS without such notice.
- 8.1.4 Non-Emergency Adverse Operating Effects.** The Company may disconnect the Generating Facility if the Generating Facility is having an adverse operating effect on the Company's EPS or on other customers. The Company may disconnect the Generating Facility if the Generator fails to correct such adverse operating effect after written notice has been provided and a maximum of 45 calendar days to correct such adverse operating effect has elapsed.
- 8.1.5 Modification of the Generating Facility.** The Company has the right to immediately suspend interconnection service in cases where material modification to the Generating Facility or interconnection facilities have been implemented without prior written authorization from Company.
- 8.1.6 Re-connection.** Any curtailment, reduction or disconnection shall continue only for so long as reasonably necessary. The Generator and the Company will cooperate with each other to restore the Generating Facility and the Company EPS respectively, to their

normal operating state as soon as reasonably practicable following the cessation or remedy of the event that led to the temporary disconnection.

## **8.2 Permanent Disconnection**

The Generator has the right to permanently disconnect at any time with 30 calendar days written notice to Company.

**8.2.1** Company may permanently disconnect the Generating Facility upon termination of the Interconnection Agreement in accordance with the terms thereof and in the case of a Generator's inability to correct an adverse operating effect after notice thereof.

- 9. Metering.** Metering of the output from the Generating Facility shall be conducted pursuant to the terms of the "Guidelines for Generator Interconnection".
- 10. Assignment.** Except as provided herein, the Generator shall not voluntarily assign its rights or obligations, in whole or in part, under this Agreement without the Company's written consent. Any assignment the Generator purports to make without the Company's written consent shall not be valid. The Company shall not unreasonably withhold or delay its consent to the Generator's assignment of this Agreement. Notwithstanding the above, the Company's consent will not be required for any assignment made by the Generator to an Affiliate or as collateral security in connection with a financing transaction. In all events, the Generator will not be relieved of its obligations under this Agreement unless, and until, the assignee assumes in writing all obligations of this Agreement and notifies the Company of such assumption.
- 11. Confidentiality.** The Company shall maintain confidentiality of all information so designated by the Generator except as otherwise required by system operators, applicable laws and regulations.

## **12. Insurance Requirements**

### **12.1 General Liability:**

In connection with Generator's performance of its duties and obligations under the Interconnection Agreement, Generator shall maintain, during the term of the Agreement, general liability insurance with a combined single limit of not less than:

Three hundred thousand dollars (\$300,000) per occurrence and in the aggregate for bodily injury and/or property damage claims where the Gross Nameplate Rating of the Generators Facilities is greater than 10 kW and less than or equal to 100 kW.

One million dollars (\$1,000,000) per occurrence and in the aggregate for bodily injury and/or property damage claims where the Gross Nameplate Rating of the Generators Facility is greater than 100 kW and less than or equal to 1MW.

Two million dollars (\$2,000,000) per occurrence and in the aggregate for bodily injury and/or property damage claims where the Gross Nameplate Rating of the Generators Facility is greater than 1MW and less than or equal to 5MW.

Five million dollars (\$5,000,000) per occurrence and in the aggregate for bodily injury and/or property damage claims where the Gross Nameplate Rating of the Generators Facility is greater than 5MW and less than or equal to 25MW.

### **12.2 Insurer Requirements and Endorsements**

All required insurance shall be carried by reputable insurers qualified to underwrite insurance in Connecticut. In addition, all insurance shall: (a) include Company as an additional insured for Categories 4 and 5; (b) contain a severability of interest clause or cross-liability clause; (c) provide that Company shall not incur liability to the insurance carrier for payment of premium

for such insurance; and (c) provide for thirty (30) calendar days' written notice to Company prior to cancellation, termination, or material change of such insurance.

### **12.3 Evidence of Insurance**

Evidence of the insurance required shall state that coverage provided is primary, and is not excess of or contributing with any insurance or self-insurance maintained by Company.

The Generator is responsible for providing Company with evidence of insurance in compliance with this Guideline on an annual basis.

Prior to Company commencing work on system modifications, the Generator shall have its insurer furnish to Company certificates of insurance evidencing the insurance coverage required above. The Generator shall notify and send to Company a certificate of insurance for any policy written on a "claims-made" basis. Company may at its discretion require the Generator to maintain tail coverage for three years on all policies written on a "claims-made" basis.

All insurance certificates, statements of self insurance, endorsements, cancellations, terminations, alterations, and material changes of such insurance shall be issued and submitted to the appropriate Company Facilitator.

- 13. Indemnification of Company.** Generator shall indemnify, defend and hold Company and its directors, officers, employees and agents (including, but not limited to, affiliates, contractors and their employees), harmless from and against all liabilities, damages, losses, penalties, claims, demands, suits and proceedings of any nature whatsoever for personal injury (including death) or property damage to unaffiliated third parties or to the Company and its directors, officers, employees and agents that arise out of or are in any manner connected with the performance of this Agreement.
- 14. Indemnification of Generator.** Company agrees to indemnify, defend and hold harmless the Generator, its directors, officers, employees and agents (including, but not limited to, affiliates, contractors and their employees), from and against any and all damages for personal injury (including death) or property damage arising from any and all actions relating to or arising out of any material failure of the Company to observe or perform any term or provision of this Interconnection Agreement which it is the Company's obligation to observe or perform.
- 15. Limitation of Liability.** Each Party's liability to the other Party for any loss, cost, claim, injury, liability, or expense, including court costs and reasonable attorney's fees, relating to or arising from any act or omission in its performance of this Agreement, shall be limited to the amount of direct damage or liability actually incurred. In no event shall either Party be liable to the other Party for any indirect, incidental, special, consequential, or punitive damages of any kind whatsoever.
- 16. Amendments and Modifications.** No amendment or modification of this Agreement shall be binding unless in writing and duly executed by both Parties.
- 17. Permits and Approvals.** The Generator is responsible for obtaining all environmental and other permits required by governmental authorities for the construction and operation of the Generating Facility. The Company assumes no responsibility for obtaining permits, advising with respect to required permits, or assuring that proper permits have been obtained. The Generator, if requested by the Company, shall provide to the Company a copy of any permit.
- 18. Force Majeure:**
  - a. For purposes of this Agreement, "Force Majeure Event" means any event that is beyond the reasonable control of the affected Party; and that the affected Party is unable to prevent or provide against by exercising commercially reasonable efforts, including the following events or circumstances, but only to the extent they satisfy the preceding requirements: acts of war or



- (ii) One of the Parties fails to comply with any other provision of this Agreement or breaches any representation or warranty in any material respect and fails to cure or remedy that default or breach within sixty (60) calendar days after notice and written demand by the affected Party to cure the same or such longer period reasonably required to cure (not to exceed an additional 90 calendar days unless otherwise mutually agreed upon), provided that the defaulting Party diligently continues to cure until such failure is fully cured.
- (iii) A Generator modifies the Generating Facility or any part of the interconnection without the prior written approval of the Company.

20.2 Remedies. Upon the occurrence of an Event of Default, the affected Party may at its option, in addition to any remedies available under any other provision herein, do any, or any combination, as appropriate, of the following:

- a. Continue to perform and enforce this Agreement;
- b. Recover damages from the defaulting Party except as limited by this Agreement;
- c. By written notice to the defaulting Party terminate this Agreement;
- d. Pursue any other remedies it may have under this Agreement or under applicable law or in equity.

- 21. Continuation of Indemnifications.** The indemnification obligations of each Party shall continue in full force and effect regardless of whether this Interconnection Agreement has expired or been terminated, defaulted or cancelled and shall not be limited in any way by any limitation on insurance.
- 22. Governing Law.** This Agreement shall be interpreted, governed, and construed under the laws of Connecticut without giving effect to choice of law provisions that might apply to the law of a different jurisdiction.
- 23. Non-waiver.** None of the provisions of this Agreement shall be considered waived by a Party unless such waiver is given in writing. The failure of a Party to insist in any one or more instances upon strict performance of any of the provisions of this Agreement or to take advantage of any of its rights hereunder shall not be construed as a waiver of any such provisions or the relinquishment of any such rights for the future, but the same shall continue and remain in full force and effect.
- 24. Counterparts.** This Agreement may be signed in counterparts.
- 25. No Third Party Beneficiaries.** This Agreement is made solely for the benefit of the Parties hereto. Nothing in the Agreement shall be construed to create any rights in or duty to, or standard of care with respect to, or any liability to, any person not a party to this Agreement.
- 26. Dispute Resolution Procedures.** Each Party shall agree to attempt to resolve all disputes promptly, equitably and in a good faith manner. If Parties are unable to informally resolve their dispute, the following formal three step dispute resolution process must be followed:
- a. Negotiation  
Upon receipt of written request for formal dispute resolution, the parties shall negotiate in good faith for 8 business days in an attempt to resolve the disputed issues. The Step One negotiation will take place between appropriate representatives of each Party. An appropriate representative is a vice-president or a member of senior management with sufficient authority to resolve the dispute. Extensions are possible if mutually agreed to.
  - b. Mediation  
If the Parties have not resolved the dispute through Step One negotiation, the Parties agree to attempt to resolve their dispute through non-binding mediation. The Parties shall agree to a mutually agreeable mediation process and mediator. Each party will select a mediator within 5 business days and the two selected mediators will attempt to, within 5 business days, select a third, mutually agreeable, mediator. The parties shall share the cost of mediation equally. Once

the three mediators are selected and the mediation commences, the Parties agree to engage in mediation in good faith for a period of not less than 30 calendar days.

c. Department of Public Utility Control

If the Parties cannot resolve their dispute through Step Two Mediation within 30 calendar days, either Party may commence an action at the Department of Public Utility Control for resolution of the dispute.

All timeframes in this process and the Dispute Resolution Process itself may be modified by mutual agreement of the Parties.

**27. Severability.** If any clause, provision, or section of this Agreement is ruled invalid by any court of competent jurisdiction, the invalidity of such clause, provision, or section, shall not affect, materially and adversely, any of the remaining provisions herein.

**28.** Upon 30 calendar days notice, Company may terminate this Agreement if there are any changes in DPUC regulations or state law that effect Company's ability to perform its obligations under this contract.

**29. Signatures**

IN WITNESS WHEREOF, the Parties hereto have caused two (2) originals of this Agreement to be executed under seal by their duly authorized representatives.

Generator

Company

By: \_\_\_\_\_  
Name \_\_\_\_\_  
Title: \_\_\_\_\_

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

**Note:** Attachments to this Standard Interconnection Agreement; construction agreement, if required; any Special Operating Requirements; A description of the Generating Facility as studied, and incorporating any Company-approved modifications (see Paragraph 2 "Basic Understandings").  
Note: The authorization document is not effective unless accompanied by a description of the Generating Facility, including all modifications made since the application was filed, including all changes made during construction. (See Paragraph 2 "Basic Understandings.")

**Attachment 2 Company Category 2 - 5 Standard Study Authorization Agreement**

This Agreement, dated \_\_\_\_\_, is entered into by and between \_\_\_\_\_ (“Generator”) and Company, for the purpose of setting forth the terms, conditions and costs for conducting a Feasibility, Impact or Facility Study relative to the Category 2, 3, 4 and 5 processes as defined in these Guidelines

1. The Generator agrees to provide, in a timely and complete manner, all additional information and technical data necessary for Company to conduct the Study not already provided in the Generator’s application.
2. All work pertaining to the Study that is the subject of this Agreement will be approved and coordinated through the Company Facilitator, and other Company Staff and the Generator. Each party shall inform the other in writing of its designated and authorized representative, if different than what is in the application.
3. Where there are other affected systems identified by the Studies, and no single Party is in a position to prepare a comprehensive Study covering all affected systems, Company will coordinate but not be responsible for the timing of any additional studies required to determine the system modifications of the interconnection request on other affected systems. The Generator will be directly responsible to the affected system operators for all costs of any additional studies required to evaluate the impact of the interconnection on the affected systems. Company will not proceed with this Study without the Generator’s consent to have the other studies conducted.
4. Company will provide an estimate of the costs of the system modification required as a result of the Study.
5. The Study, together with any additional Studies contemplated in Paragraph 3, shall form the basis for the Generator’s proposed use of the Company EPS and shall be furthermore utilized in obtaining necessary third-party approvals of any required facilities and requested distribution services. The Generator understands and acknowledges that any use of Study results by the Generator or its agents, whether in preliminary or final form, is completely at the Generator’s risk.
6. The applicable Study fee is due in full prior to the execution of the particular Study. At the request of the Generator, Company will break the Study costs into phases in which the costs will be collected prior to Company’s expenditures for each phase of the study.
7. Company will, in writing, advise the Generator in advance of any cost increases for work to be performed if the total amount increases by 25% or more. Any such changes to Company’s costs for the work shall be subject to the Generator’s consent. The Generator shall, within ten (10) days of Company’s notice of increase, either authorize such increases or make payment in the amount set forth in such notice, or Company will suspend the work and the corresponding agreement will terminate, unless alternative arrangements agreed to in writing by the parties.
8. Final Accounting. Upon request by the Generator, Company within ninety (90) calendar days after completion of the construction and installation of the system modifications described in an attached exhibit to the Interconnection Agreement, shall provide Generator with a final accounting report of any difference between (a) Generator’s cost responsibility under the Interconnection Agreement for the actual cost of such system modifications, and (b) Generator’s previous aggregate payments to Company for such system modifications. To the extent that Generator’s cost responsibility in the Interconnection Agreement exceeds Generator’s previous aggregate payments, Company

shall invoice Generator and Generator shall make payment to Company within 45 calendar days.

To the extent that Generator's previous aggregate payments exceed Generator's costs responsibility under this agreement, Company shall refund to Generator an amount equal to the difference within forty five (45) calendar days of the provision of such final accounting report.

9. In the event this Agreement is terminated for any reason, Company shall refund to the Generator the portion of the above fee or any subsequent payment to Company by the Generator that Company did not expend or commit in performing its obligations under this Agreement.
10. Nothing in this Agreement shall be interpreted to give the Generator immediate rights to wheel over or interconnect with Company's EPS.
11. Generator shall indemnify, defend and hold Company and its directors, officers, employees and agents (including, but not limited to, affiliates and contractors and its employees), harmless from and against all liabilities, damages, losses, penalties, claims, demands, suits and proceedings of any nature whatsoever for personal injury (including death) or property damages to unaffiliated third parties that arise out of or are in any manner connected with the performance of this Agreement.
12. Notwithstanding the foregoing, the Generator hereby waives recourse against Company and its affiliates for, and releases Company and its affiliates from, any and all liabilities arising from or attributable to information supplied by the Generator.
13. This agreement shall be construed and governed in accordance with the laws of Connecticut.
14. All amendments to this Agreement shall be in written form executed by both Parties.
15. The terms and conditions of this Agreement shall be binding on the successors and assignees of either Party.
16. This Agreement will remain in effect for a period of up to two years from its effective date.
17. This Agreement may be terminated under the following conditions.
  - a) The Parties agree in writing to terminate the Agreement.
  - b) The Generator may terminate this agreement at any time by providing written notice to Company.
  - c) Company may terminate this Agreement if the Generator either:
    - (1) has not paid the fee, or
    - (2) has not responded to requests for further information in accordance with provisions in these Guidelines.

Generator:

Company:

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

### ***Attachment 3 Screening Criteria***

The following criteria are used as a guide in conducting the Application Review to help evaluate the proposed generator's impact on the EPS and whether further detailed study is required by the Company to determine impact on EPS.

If the proposed Generating Facility installation meets the following screens, the Company will not charge for any studies for that installation. The Company reserves the right to conduct additional studies if deemed necessary and at no additional cost to the Generator, such as, but not limited to: protection review, aggregate harmonics analysis and power quality review, aggregate power factor review and voltage regulation review. If the studies indicate corrections are required, the Generator shall be responsible for the cost of the material/the cost of the correction. All studies will be completed by the Company within the total time limits of Table 1.

If one or more criteria are not met by the Generating Facility, the Company will proceed with the process as defined for the appropriate category. The Company will work with the Generating Facility to develop mutually agreeable alternative plans.

- For interconnection of a proposed Generating Facility to a radial distribution circuit, the aggregated generation, including the proposed Generating Facility, on the circuit will not exceed 5% of the total circuit annual peak load as most recently measured at the substation.
- For interconnection of a proposed Generating Facility to the load side of spot network protectors, the proposed Generating Facility must be 50 kW or less in size, must utilize an inverter-based equipment package and must not in aggregate with all other Generating Facilities exceed 50% of the spot network's minimum load. The inverter must be certified to stop conducting prior to the 3 cycle response of the network relays.
- The proposed Generating Facility, in aggregation with other generation on the distribution circuit, will not contribute more than 10% to the distribution circuit's maximum fault current at the point on the high voltage (primary) level nearest the proposed point of common coupling. In addition, the proposed Generating Facility must not put the distribution circuit voltage over its Department-defined limit.
- The proposed Generating Facility in aggregate with other generation on the distribution circuit, will not cause any distribution protective devices and equipment (including but not limited to substation breakers, fuse cutouts, and line reclosers), or customer equipment on the system to exceed 85 percent of the short circuit interrupting capability; nor is the interconnection proposed for a circuit that already exceeds 85 percent of the short circuit interruption capability.
- For interconnection of a proposed three-phase Generating Facility to a three-phase four-wire distribution circuit or a distribution circuit having mixed three-wire and four-wire sections, the aggregate generation capacity including the proposed Small Generator will not exceed 10% of line section peak load.

- If the proposed Generating Facility is to be interconnected on single-phase shared secondary, the aggregate generation capacity on the shared secondary, including the proposed generator, will not exceed 20 kVA.
- If the proposed Generating Facility is single-phase and is to be interconnected on a center tap neutral of a 240 volt service, its addition will not create imbalance between the two sides of the 240 volt service of more than 30% of nameplate rating of the service transformer.
- The proposed Generating Facility is not interconnected at a 69 kV or higher voltages.
- The proposed Generating Facility is not a standalone inverter, capable of operation independent of the EPS.

## ***Attachment 4- Codes and Standards***

### **Codes and Standards**

Company recommends that the following existing codes and standards (in addition to any successor codes and standards) shall be applied as appropriate:

- ANSI C12.1-2001 “American National Standard for Electric Meter Code for Electricity Metering”
- ANSI C12.11-1993 “Instrument Transformers for Metering 15 kV and Below
- ANSI C84.1-1995 Electric Power Systems and Equipment – Voltage Ratings (60 Hertz)
- ANSI/IEEE C37.90-1989 IEEE Standard “Relays and Relay Systems Associated with Electric Power Apparatus”
- ANSI/IEEE C37.90-1-1989 IEEE Standard “Surge Withstand Capability [SWC] Tests for Protective Relays and Relay Systems”
- ANSI/IEEE C57.13-1987 “Requirements for Instrument Transformers”
- ANSI/IEEE Std C37.90.2 (1995), IEEE Standard “Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers”
- ANSI/IEEE C62.41-1991 “Recommended Practice on Surge Voltages in Low Voltage AC Power Circuits”
- ANSI/IEEE Std C62.41.2-2002, IEEE Recommended Practice on Characterization of Surges in Low Voltage (1000V and Less) AC Power Circuits
- ANSI/IEEE Std C62.45-1992 (R2002), IEEE Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage (1000V and Less) AC Power Circuits
- IEC 1000-4-15 Flickermeter- Functional and Design Specifications
- IEC 61400-21 Wind Turbine Generator Systems
- IEC 61400-21 Part 21 Measurement and Assessment of Power Quality Characteristics of Grid Connected Wind Turbines
- IEEE Std p1453 Draft, Recommended Practices for Measurement and Limits of Voltage Flicker on AC Power Systems
- IEEE p 1547.1 Draft Std for Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems
- IEEE p 1547.2 Draft Application Guide for IEEE Standard 1547 for Interconnecting Distributed Resources with Electric Power Systems
- IEEE p 1547.3 Draft Guide for Monitoring, Information Exchange and Control of DR Interconnection with Electric Power Systems
- IEEE 1547-2003 IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems.
- IEEE Std 100-2000, IEEE Standard Dictionary of Electrical and Electronic Terms
- IEEE Std 519-1992, IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems
- IEEE Std 929-2000 IEEE Recommended Practice for Utility Interface of Photovoltaic (PV) Systems
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- IEC 255-22-2 Electrostatic Discharge
- IEC 255-5 Insulation (Impulse Voltage Withstand)