Central Hudson Gas & Electric Corporation (CHG&E)
Application Process for Distributed Generators of Greater than 300 kVA
Connected in Parallel with the CHG&E Electrical Delivery System

Dated: April 16, 2002

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I. Central Hudson Gas & Electric Corporation (CHG&E) Application Process for the Interconnection of Distributed Generation Units of Greater than 300 kVA Connected in Parallel with the CHG&E Electrical Delivery System

A. Introduction

This section provides a framework for processing applications to:

- interconnect new distributed generation facilities with a nameplate rating of greater than 300 kVA (aggregated on the customer side of the Point of Common Coupling (PCC)[1]) connected in parallel with the Central Hudson Gas & Electric Corporation (CHG&E) electrical delivery system.

- review any modifications affecting the interface at the PCC to existing distributed generation facilities with a nameplate rating of greater than 300 kVA (aggregated on the customer side of the PCC) that have been interconnected with CHG&E's electrical delivery system and where an existing contract or tariff agreement between the Customer[2] and CHG&E is in place.

Generation neither designed to operate, nor operating, in parallel with the CHG&E electrical system is not subject to these requirements. This document will ensure that Customers are aware of CHG&E's interconnection policies and practices. This document will also provide Customers with an understanding of the process and information required to allow CHG&E to review and accept the Customer's equipment for interconnection in a reasonable and expeditious manner.

The time required to complete the process will reflect the complexity of the proposed project. Projects using previously submitted designs that have been satisfactorily Type-Tested[3] will move through the process more quickly, and several steps may be satisfied with an initial application depending on the detail and completeness of the application and supporting documentation submitted by the Customer. Customers submitting Type-Tested systems, however, are not exempt from providing CHG&E with complete design packages necessary for the CHG&E to verify the electrical characteristics of the generator systems, the interconnecting facilities, and the impacts of the Customer's equipment on the CHG&E electrical system.

The application process and the attendant services are offered by CHG&E on a non-discriminatory basis. CHG&E will identify our costs related to the Customer's interconnection, specifically those costs CHG&E would not have incurred but for the Customer's interconnection. CHG&E will keep a log of the application, milestones met, and justifications for application-specific requirements. The Customer will be responsible for payment of CHG&E's costs, as provided for herein.

[1] See Section II: Glossary for definition.
[2] Ibid.
[3] Ibid.

B. Application Process Steps

STEP 1: Initial Communication from the Potential Customer.

The potential Customer contacts CHG&E to enquire about our interconnection requirements. Communication could range from a general inquiry to a completed application.

STEP 2: The Inquiry is Reviewed by CHG&E to Determine the Nature of the Project.

Technical staff from CHG&E discusses the scope of the project with the potential Customer (either by phone or in person) to determine what specific information and documents (such as an application, contract, technical requirements, specifications, listing of qualified Type-Tested equipment/systems, application fee information, applicable rate schedules, and metering requirements) will be provided to the potential Customer. The preliminary technical feasibility of the project at the proposed location may also be discussed at this time. All such information and a copy of this CHG&E Application Process and a copy of CHG&E's Interconnection Protection Requirements document will be sent to the Customer within three (3) business days following the initial communication from the potential Customer, unless the potential Customer indicates otherwise. A CHG&E representative will serve as the single point of contact for the Customer (unless CHG&E informs the Customer otherwise) in coordinating the potential Customer's project with CHG&E.

STEP 3: Potential Customer Submits an Application.

The potential Customer submits an application to CHG&E. The submittal must include (i) a completed standard application form[4], (ii) a standard one-line diagram of the proposed system, and (iii) a non-refundable $350 application fee. (If the Customer proceeds with the project to completion, the application fee will be applied as a payment to CHG&E's actual total cost for interconnection, including the cost of processing the application.) Within five (5) business days of receiving the application, CHG&E will notify the Customer of receipt and whether the application has been completed adequately. It is in the best interest of the Customer to provide CHG&E with all pertinent technical information as early as possible in the process. If the required documentation is presented in this step, it will allow CHG&E to perform the required reviews and allow the process to proceed more expeditiously.

[4] See Section III: Appendix for sample form

STEP 4: CHG&E Completes a Preliminary Review[5] and Develops a Cost Estimate for the Coordinated Electric System Interconnection Review (CESIR)[6].

CHG&E will complete a Preliminary Review of the proposed interconnection. Upon completion of the Preliminary Review, CHG&E will inform the Customer as to whether the interconnection of the proposed system is viable or not, and provide the Customer with an estimate of the costs associated with the completion of the CESIR. The CESIR will not commence until CHG&E has received payment from the Customer for the total estimated cost of the CESIR.

CHG&E reviews application screening processes, as they are developed nationally, to minimize the cost of these studies.

STEP 5: Customer Authorizes CHG&E to Perform the CESIR

The Customer will authorize CHG&E to perform the CESIR by providing the following to CHG&E:

- a complete detailed interconnection design package;
- the name and phone number of the individual(s) responsible for addressing technical and contractual questions regarding the proposed system interconnection; and
- advanced payment of the costs associated with completion of the CESIR (see Step 4);

The complete detailed interconnection design package (see the CHG&E Interconnection Requirements document for further discussion) shall include:

(1) Electrical schematic drawing(s) reflecting the complete proposed system design which are easily interpreted and of a quality necessary for a full interconnection. The electrical drawings shall show all electrical components proposed for the installation and their connections to the existing on-site electrical system from their point of connection to the PCC. A Professional Engineer's stamp must be affixed to all design drawings submitted.

(2) A complete listing of all interconnection devices proposed for use and their respective specifications. Specifications must be provided in the form of manufacturer's instruction/installation manuals and interconnection protection and control device settings.

[5] See Section II: Glossary for definition
[6] See Section II: Glossary for definition.

(3) Any additional information requested by the CHG&E regarding the existing on-site electrical equipment. This information will be requested on a case-by-case basis, and only in cases where it is required in order to ensure an accurate technical review of the proposed system interconnection.

CHG&E will not begin the CESIR until all the requirements of this Step 5 are met.

STEP 6: CHG&E Completes the CESIR

The CESIR will consist of two parts: (1) a review of the impacts to the CHG&E electrical system associated with the interconnection of the proposed system, and (2) a review of the Customer's proposed system's compliance with CHG&E's interconnection requirements.

The CESIR will be completed within 8 weeks (40 business days) of the date of receipt of a complete design package and the advanced payment, as set forth in Step 5. For systems utilizing Type-Tested equipment, the time required to complete the study may be reduced.

Upon completion of the CESIR, CHG&E will provide the Customer, in writing, the following:

- CHG&E electrical system impacts, if any;
- Notification of whether the proposed system meets CHG&E's interconnection requirements;
- If applicable, a description of where the proposed system is not in compliance with CHG&E's interconnection requirements;
- Estimated cost[7] of CHG&E's work required to interconnect the Customer's proposed system. Such estimate will include, but not be limited to, the costs associated with any required modifications (Dedicated Facilities) to CHG&E's electrical system, administration, metering and on-site Verification Testing[8]; and
- Any site-specific test requirements applicable to STEP 9.

STEP 7: Customer Commits to CHG&E's Construction of CHG&E Electrical System Modifications Identified by the CESIR.

The Customer will notify CHG&E, in writing, within twenty (20) business days as to whether it will proceed with the interconnection of the proposed system. If the Customer

[7] This is only an estimate and the Customer will be responsible for actual costs incurred by CHG&E related to the interconnection of the Customer's proposed system

[8] See Section II: Glossary for definition.

chooses not to proceed with the interconnection of the proposed system, CHG&E will reconcile its actual costs related to the Customer's project against the application fee and advance payment made by the Customer. The Customer will receive either a bill for any balance due or a reimbursement for overpayment as determined by CHG&E's reconciliation.

If the Customer chooses to proceed with the interconnection of the proposed system then it will:

- execute an appropriate interconnection contract;
- provide CHG&E with an advance payment for CHG&E's estimated costs associated with CHG&E's required electrical system modifications, administration, metering, and on-site Verification Testing, as set forth in Step 6.[9] (Estimated costs will be reconciled upon completion of the interconnection.)
- work with CHG&E in developing a mutually agreeable project schedule.

STEP 8: Project Construction.

The Customer will build the facility in accordance with the CHG&E accepted design. CHG&E will commence construction/installation of the electrical system modifications and metering requirements as identified in STEP 6. CHG&E electrical system modifications will vary in construction time depending on the extent of work and equipment required. The schedule for this work is to be discussed with the Customer in STEP 7. If any modifications are made to either the originally proposed Customer's system design or required the CHG&E electrical system modifications, then the party responsible for the modification will notify the other party as soon as practicable and the parties will jointly modify the schedule accordingly.

STEP 9: The Customer's Facility is Tested in Accordance With CHG&E's Interconnection Requirements.

The Customer shall provide a written functional testing plan to CHG&E for review and acceptance. The test plan shall include the Verification Test procedure(s) provided by the manufacturer of the interconnection equipment. (In the case of Type Tested equipment, the test plan must also be approved by an independent test laboratory.) This functional testing plan shall be designed to verify compliance of the facility with the Customer's drawings and details of the interconnection (as accepted by CHG&E at the completion of Step 6). The testing will be performed in accordance with the Verification Test

[9] This is only an estimate and the Customer will be responsible for actual costs incurred by CHG&E related to the interconnection of the Customer's proposed system.

procedure and any site-specific requirements identified by CHG&E in STEP 6.

Certification of compliance with applicable code requirements by the Authority Having Jurisdiction (AHJ) of such codes is required before the Verification Test procedure can be performed.

The functional test procedure will be conducted at a mutually agreeable time between CHG&E and the Customer, and CHG&E shall be given the opportunity to witness the tests. Prior to conductance of the functional test, the Customer shall verify and report to CHG&E, in writing, that the system has been fully constructed in accordance with the approved design package submitted to CHG&E and that the system is in proper working order to the fullest extent possible.

STEP 10: Interconnection.

The Customer's system will be granted conditional acceptance and will be allowed to interconnect to the CHG&E electrical system upon satisfactory completion of the tests identified in STEP 9, and, upon full compliance with CHG&E's contractual and technical interconnection requirements. The Customer must continue to comply with CHG&E's contractual and technical interconnection requirements, as they may be amended from time to time, throughout the duration of the proposed system's interconnection to CHG&E's electrical delivery system.

If the Customer's proposed system does not successfully complete the test procedure in STEP 9 and/or does not fully comply with CHG&E's contractual and technical interconnection requirements, then CHG&E will notify the Customer within ten (10) days of conductance of the functional test procedure. Such notification shall identify the compliance failure(s). The Customer will be responsible for making the appropriate modification(s) to the proposed system and another date will be scheduled for a functional test which will be agreed to by CHG&E and Customer. If modifications are required to CHG&E's electrical system, then CHG&E is responsible for making such modifications.

STEP 11: Final Acceptance and CHG&E Cost Reconciliation.

Upon successful completion of STEP 10, within sixty (60) business days after interconnection, CHG&E will review the results of its functional test and issue to the Customer a formal letter of acceptance for interconnection. CHG&E will also reconcile its actual costs related to the Customer's project against the application fee and advance payments made by the Customer. The Customer will receive either a bill for any balance due or a reimbursement for overpayment as determined by CHG&E's reconciliation.

II. Glossary of Terms

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

Customer: A customer applying to operate on-site power generation equipment in parallel with the utility grid per the requirements of this document.

Point of Common Coupling (PCC): The point at which the interconnection between the electric utility and the customer interface occurs. Typically, this is the customer side of the utility revenue meter. [Adopted from IEEE 929-2000.]

Preliminary Review: A review of the Customer's proposed system's capacity, location on the utility's system, capacity rating of the power system conductors, and general system regulation to determine if the interconnection is viable.

Type Test: A test performed or witnessed once by a qualified independent testing laboratory for a specific protection package or device to determine whether the requirements of this document are met. The Type Test will typically be sponsored by equipment manufacturers.

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

III. Appendix

CHG&E CORPORATION STANDARD APPLICATION
FOR INTERCONNECTION OF DISTRIBUTED GENERATION
EQUIPMENT GREATER THAN 300 KVA CONNECTED IN PARALLEL CHG&E's
ELECTRICAL DELIVERY SYSTEM

Customer:
Name: _____ Phone: (___)_____

Address:_____ Municipality: _____

_____

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

Address:_____

_____

Estimated In-Service Date: _____

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

New Electric Service (If Applicable):
Capacity: _____Amperes Voltage: _____Volts
Service Character: ( )Single Phase ( )Three Phase
Secondary 3 Phase Transformer Connection ( )Wye ( )Delta
Transformer Impedance _____ %Z

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

_____

Energy Producing Equipment/Inverter Information:
Manufacturer: _____
Model No. _____ Version No. _____
( )Synchronous ( )Induction ( )Inverter ( )Other_____
Rating: _____kW Rating: _____kVA
Rated Output: ____VA Rated Voltage: ____Volts
Rate Frequency: ____Hertz Rated Speed: ____RPM
Efficiency: ____% Power Factor: ____%
Rated Current: ____Amps Locked Rotor Current: ____Amps
Synchronous Speed: ____RPM Winding Connection:
Min. Operating Freq./Time:
Generator Connection: ( )Delta ( )Wye ( )Wye Grounded
System Type Tested (Total System): ( )Yes ( )No; attach product literature
Equipment Type Tested (i.e. Inverter, Protection System):
( )Yes ( )No; attach product literature

One Line Diagram attached: ( )Yes
Installation Test Plan attached: ( )Yes

For Synchronous Machines:

Submit copies of the Saturation Curve and the Vee Curve
( )Salient ( )Non-Salient
Torque: _____lb-ft Rated RPM: _____
Field Amperes: _____ at rated generator voltage and current
and _____% PF over-excited
Type of Exciter: _____
Output Power of Exciter: _____
Type of Voltage Regulator: _____
Direct-axis Synchronous Reactance (X_d) _____ohms
Direct-axis Transient Reactance (X'_d) _____ohms
Direct-axis Sub-transient Reactance (X''_d) _____ohms
Quadrature-axis Synchronous Reactance (X_q) _____ohms
Quadrature-axis Transient Reactance (X'_q) _____ohms
Quadrature-axis Sub-transient Reactance (X''_q) _____ohms
Zero Sequence Reactance (X_o)_____ohms
Negative Sequence Reactance (X_2)
Field Winding Open Circuit Transient Time Constant (T')_____seconds
Field Winding Short Circuit Transient Time Constant (T')_____seconds
Field Winding Short Circuit Subtransient Time Constant (T'')_____seconds
Armature Winding Transient Time Constant (with field winding shorted)(T')_____seconds
Damper (Amoritisseur) Winding? ( ) Yes ( ) No
Neutral Grounded ( ) No ( ) Yes _____ ohms (resistive) _____ ohms (reactive)

For Induction Machines:

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

For Inverters:

Manufacturer: _____ Model:
Type: ___ ( )Forced Commutated ( )Line Commutated
Rated Output: ____Amps _____Volts
Efficiency: _____%

Signature:

CUSTOMER SIGNATURE	TITLE	DATE