



Emera Maine

Guidelines for Generator Interconnection

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I. Introduction

Emera Maine is the second largest electric utility in Maine, serving the eastern and eastern coastal portions of the state. It is the Company's policy to encourage renewable resource generation and to permit operation of customer-owned generators in parallel with the Emera Maine system whenever this can be done without impacting the quality of service to other customers or the safety of the employees and equipment of Emera Maine.

In order to carry out their responsibilities to all Customers, the Company 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.

These Guidelines envision that the Customer and the Company will work together toward the common goal of a successful interconnection. In working together, the Company is 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.

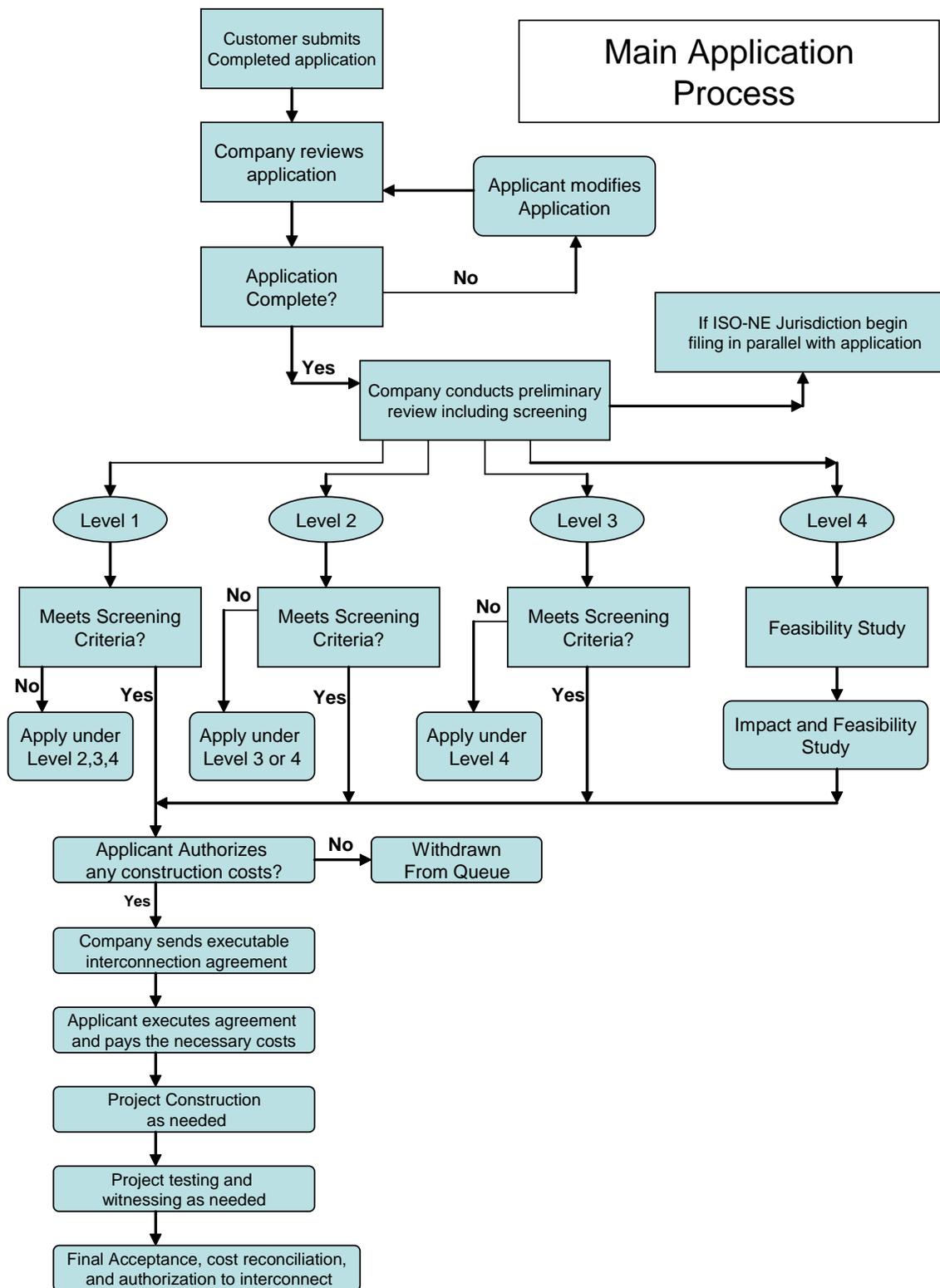
If there are any questions regarding the economic viability of installing cogeneration, those inquiries can be forwarded to Gina LeBlanc-Eggert, Key Accounts Representative, at 207-760-2458.

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

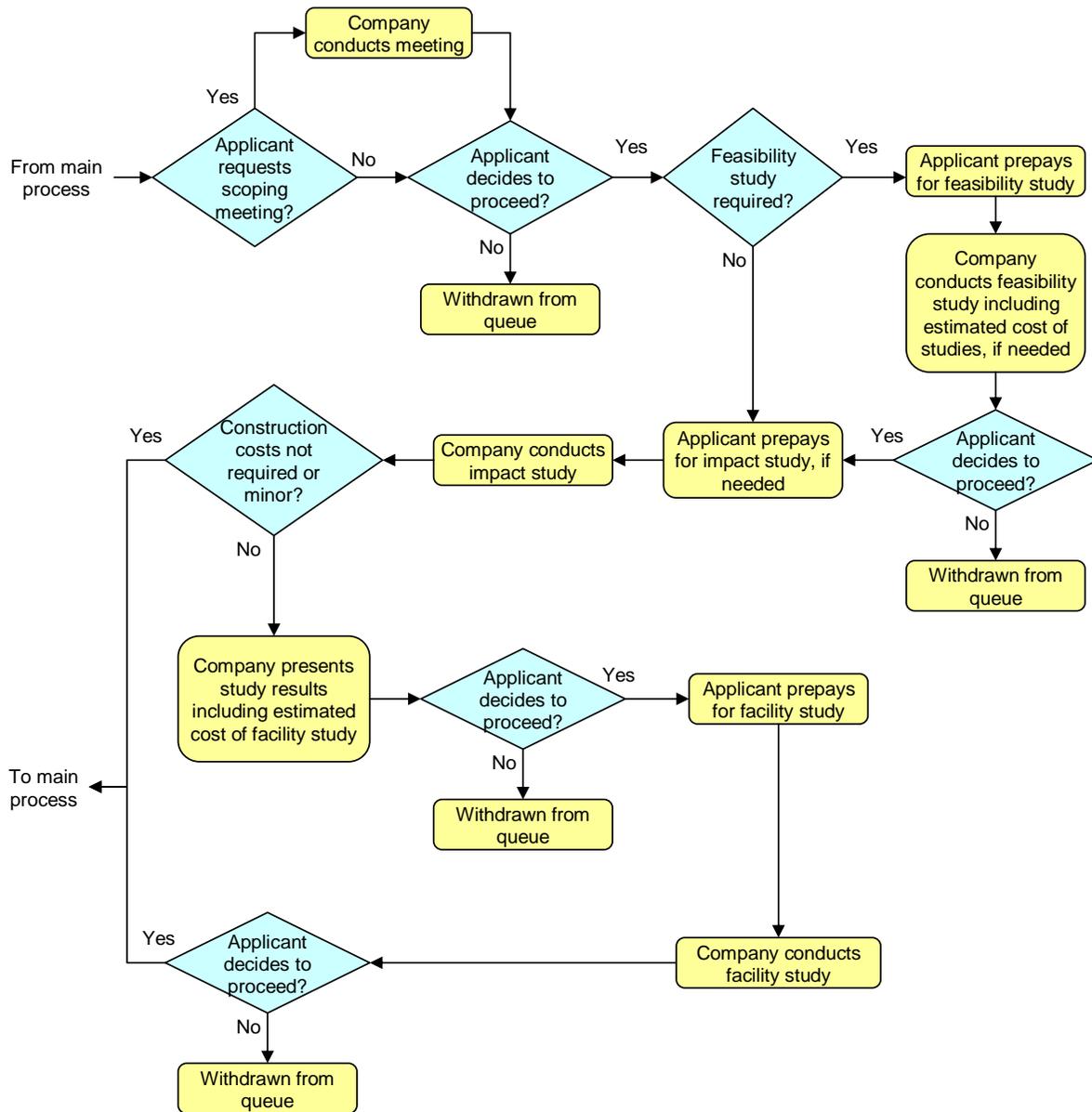
The Company Facilitator for Emera Maine can be contacted via email at **Jessica.Webb@emeramaine.com**, by phone at **(207) 973-2862** or by mail at:

Emera Maine
Attn: Jessica Taylor Webb
PO Box 932
Bangor, Maine 04402-0932

Interconnection Process Charts



Impact and Facility Study Process



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:

Level*	Use Application Package	Processing Times (maximum)
<u>Level 1</u> Inverter-Based Generators Not Greater than 10KW	Attachment 6, Level 1 Standard Interconnection Application	See attachment 3
<u>Level 2</u> Generators Not Greater than 2MW	Attachment 6, Level 2&3 Standard Interconnection Application	See attachment 3
<u>Level 3</u> Non-Exporting Generators Not Greater than 10MW	Attachment 6, Level 2&3 Standard Interconnection Application	See attachment 3
<u>Level 4</u> All Generators Not Subject to FERC Jurisdiction	Attachment 6	See attachment 3

*All Levels 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 Level 2, 3 & 4 Generating Facilities

Level 2, 3 & 4 Interconnection applications must be completed with ISO-NE per the procedure set forth on their website at:

http://www.isone.com/genrtion_resrcs/nwgen_inter/smgen_20/small_interconnection_request_form_0217_2009.doc

c. Application Process for Interconnecting Levels 1-4 Generating Facilities

Step 1 Generator Submits Application

1. The process begins with the submission of a **completed** application to the Company. The following is required:
 - A **completed** standard interconnection application based on the level 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 should obtain Company approval in writing of any modifications to the generating facility described in the application.

2. The application should be submitted to the Company Facilitator along with applicable application fees set forth by the MPUC.
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 3 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 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.
**Note: the estimate is based on BHE Crew Construction.*

Depending on BHE availability, any and all work associated with your interconnection may need to be contracted at a possible higher cost.

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.
4. 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.
***Note that estimate is based on BHE Crew Construction.*

Depending on BHE availability, any and all work associated with your interconnection may need to be contracted at a possible higher cost.

Step 8 Applicant Executes Interconnection Agreement, Authorizes Work and Defrays Costs

1. In this step, an agreement is developed for the construction of and 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 Level 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.

Table 2: Fees			
Level	Nameplate Rating*	Application	Each Study Fee
Level 1	Inverter-Based Generators Not Greater than 10KW	\$50	
Level 2	Generators Not Greater than 2MW	\$50 plus \$1.00/KW	Actual Time Based
Level 3	Non-Exporting Generators Not Greater than 10MW	\$100 plus \$1.50/KW	Actual Time Based
Level 4	All Generators Not Subject to FERC Jurisdiction	\$100 plus \$2.00/kW (\$400 max)	Actual Time Based

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

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. Any costs associated with protection upgrades or modifications deemed necessary based on Good Utility Practice in order to accommodate the output from the Generator shall be the responsibility of the Applicant. Payment of the estimated cost of the modification is required before work will commence.

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 Standard Provisions in the Maine Public Utility Commission's Standard Generator Interconnection Rules) 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)* (Feasibility Study, Impact Study, and/or 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).

For generators utilizing renewable resources primarily for internal use, facilities 660 kW or less qualify for net metering. In this case a *Net metering Interconnection Agreement* should be completed in place of the Standard Interconnection Agreement.

4. *Aggregation Agreement* must be completed if the facility would like the Standard Offer Provider to purchase the output of their facility. All facilities with less than 5MW output qualify for this arrangement as set forth in Section 21 the Company's Terms & Conditions on file with the MPUC.

Generators who qualify for the net metering option may choose the Aggregation option instead of net metering (or make use of any other applicable selling option) but may only change between options a maximum of once per year.

If an extension to a Company owned line is required in order to accommodate the interconnection, the Company will obtain suitable easements or rights of way for the extension and the Applicant will be responsible for all costs incurred.

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

a. General Liability:

The Generator is not required to provide general liability insurance coverage as part of this Agreement, or any other Company requirement. Due to the risk of incurring damages, the State regulatory commission may recommend that every Generator protect itself with insurance or other suitable financial instrument sufficient to meet its construction, operating and liability responsibilities pursuant to this Agreement. At no time shall the Company require that the Generator negotiate any policy or renewal of any policy covering any liability through a particular insurance company, agent, solicitor, or broker.

b. Effect

The inability of the Company to require the Generator to provide general liability insurance coverage for operation of the new generation resource is not a waiver of any rights the Company may have to pursue remedies at law against the Generator to recover damages.

IV Technical Requirements

1.0 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 the property on which the Company is required to locate its equipment or facilities to serve the Generating Facility, 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

Metering and Related Equipment

Metering of the output from the Generating Facility shall be by meters and metering devices provided, installed, owned, and maintained by the Company. The Company will make a one-time charge for the equipment, or the Generator may supply equipment acceptable to the Company. Bi-directional energy flow must be metered for any Generator facility connected in parallel with the Company's EPS.

All meters used to determine the billing hereunder shall be sealed and the seals shall be broken only by the Company and upon occasions when the meters are to be inspected, tested or adjusted. The Generator shall provide access for a representative of the Company to the billing meters at all reasonable times for the purpose of meter reading. The Company shall make periodic tests of the aforesaid metering equipment. Upon request of the Generator, the Company will make additional tests. However, if the Generator requests a test to be made within twelve months of a previous test, such test shall be at the expense of the Generator if the meter proves to be accurate within 4%.

In the event errors greater than 4% are discovered, the cost of the test shall be at the expense of the Company. Retroactive billing adjustments for errors found as a result of any test shall be made for a period equal to one-half of the time elapsed since the previous tests, but not to exceed six months.

Each party shall give reasonable notice to the other party of the time when any inspection or test shall take place, and that party may have representatives present at the test or inspection. The Generator shall be notified prior to all metering tests and shall have the right to observe the test and perform its own test. If the meter is found to be inaccurate or defective, it shall be adjusted, repaired or replaced, at the Company's expense, in order to provide accurate metering.

Supervisory Control and Data

The Company employs a Supervisory Control and Data Acquisition (SCADA) system to control and monitor the status of its power system. This SCADA system provides real time status of the power system and its components by gathering information at each installation via a Remote Terminal Unit (RTU) or equivalent device interconnected to a Master Control Computer.

Generation facilities with 3MW or more of net generation must have an RTU or similar equipment, as approved by the Company, to provide the necessary information and control for monitoring the stability and maintaining the integrity of the EPS.

The Generator's RTU design and procurement must be reviewed with the Company to ensure compatibility with the Company's SCADA Master

Additional Monitoring and Communication requirements

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

4.0 Protection Requirements for New or Modified Generating Facility Interconnections

4.1 General Considerations

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. When connecting to a distribution circuit, a maximum output of the aggregate of all generation interconnected to the distribution low voltage side of the substation transformer may be imposed if it is determined that 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) or line voltage regulator(s), the Company may make control modifications to these devices to mitigate the effects. These modifications would be at the Generator's expense. Otherwise 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 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 Company shall have the right to open the disconnect switch as required.

4.2 Intertie Requirements

4.2.1 Mutual Requirements

All Level 1, 2, 3 & 4 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). Level 2, 3 & 4 interconnections come within the ISO-NE jurisdiction and shall be handled via 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: The Generator shall not cause the Company EPS service voltage or other Company EPS customer's voltage to exceed plus five percent (+ 5%) from the standard voltage for any period longer than five seconds. Meeting this requirement may require modifications to the EPS, at the expense of the generator.

2) Non Export Power

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. This would not apply to equipment that includes a certified non-landing function. Other methods that might mitigate for this issue 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 Company will procure any necessary communications channels between the Generating Facility and the Company's stations and will provide protection from transients and over voltages at all ends of these communication channels. The Generator is responsible for bearing these installation costs as well as 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.

4.2.2 Synchronous and Induction Facilities

The following requirements apply to all synchronous and induction generators.

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 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 faults 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 that 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, approved 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. Under frequency Load Shedding

Existing under frequency 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.

The following additional requirements apply to all synchronous generators:

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 at unity power factor unless the Impact Study specifies a specific power factor to maintain the EPS voltage at an acceptable level. For units 1 MW and larger and exporting power to the EPS, generators shall be capable of operating at 0.85 (either leading or lagging) power factor. If the Company requests that the Generator operate in a revised power factor range during a system emergency, the Company will compensate the Generator for any additional expense of such revised operation.

5. Regulators

The Generator must provide automatic voltage regulators for Facilities larger than 100 kW that are rated to operate at both maximum and minimum voltage levels as prescribed by the MPUC. 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.

The following additional requirements apply to all 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.

4.2.3 Converter and Inverter Facilities

The Company recognizes 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 requirements for UL 1741 may be applied to inverters with both photovoltaic and other electric energy sources.

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.

Generating Facilities utilizing photovoltaic technology, the system must be in compliance with IEEE 929 specifications and requirements

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.

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.

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.

Level 1 Facilities

a. Pre-certified 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 Level 1 interconnection.

b. Non-Pre-certified Facilities

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

4.3 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

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.

4.4 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 miss-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.

4.5 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.

Attachment 1: 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.

Company: EMERA MAINE.

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.

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.

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 115kV 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 EMERA MAINE 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 that 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.

MPUC: Maine Public Utility Commission.

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 MPUC.

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.

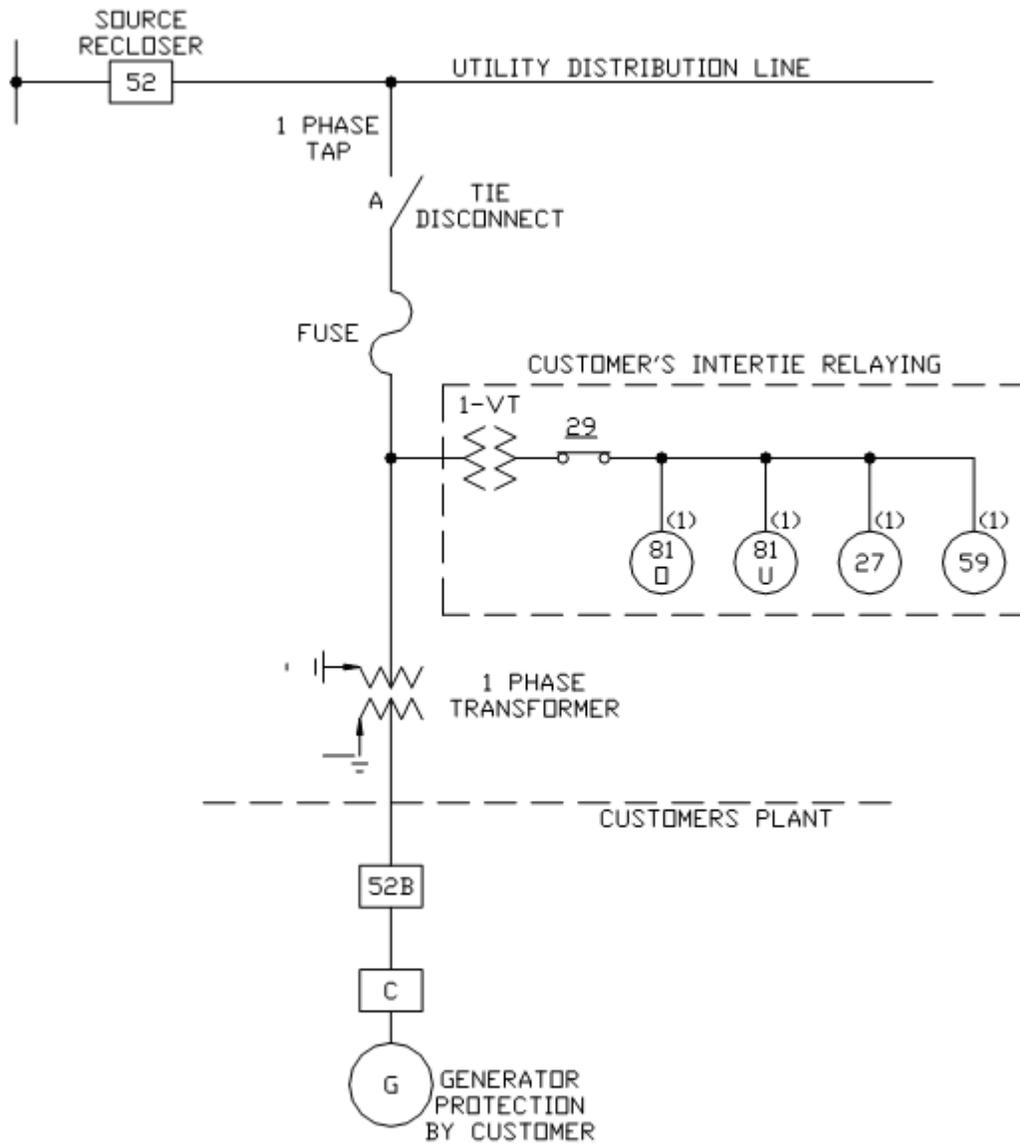
Synchronous Generator: A synchronous alternating-current machine which transforms mechanical power into electric power. (A synchronous machine is one in which the average speed of normal operation is exactly proportional to the frequency of the system to which it is connected.)

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.

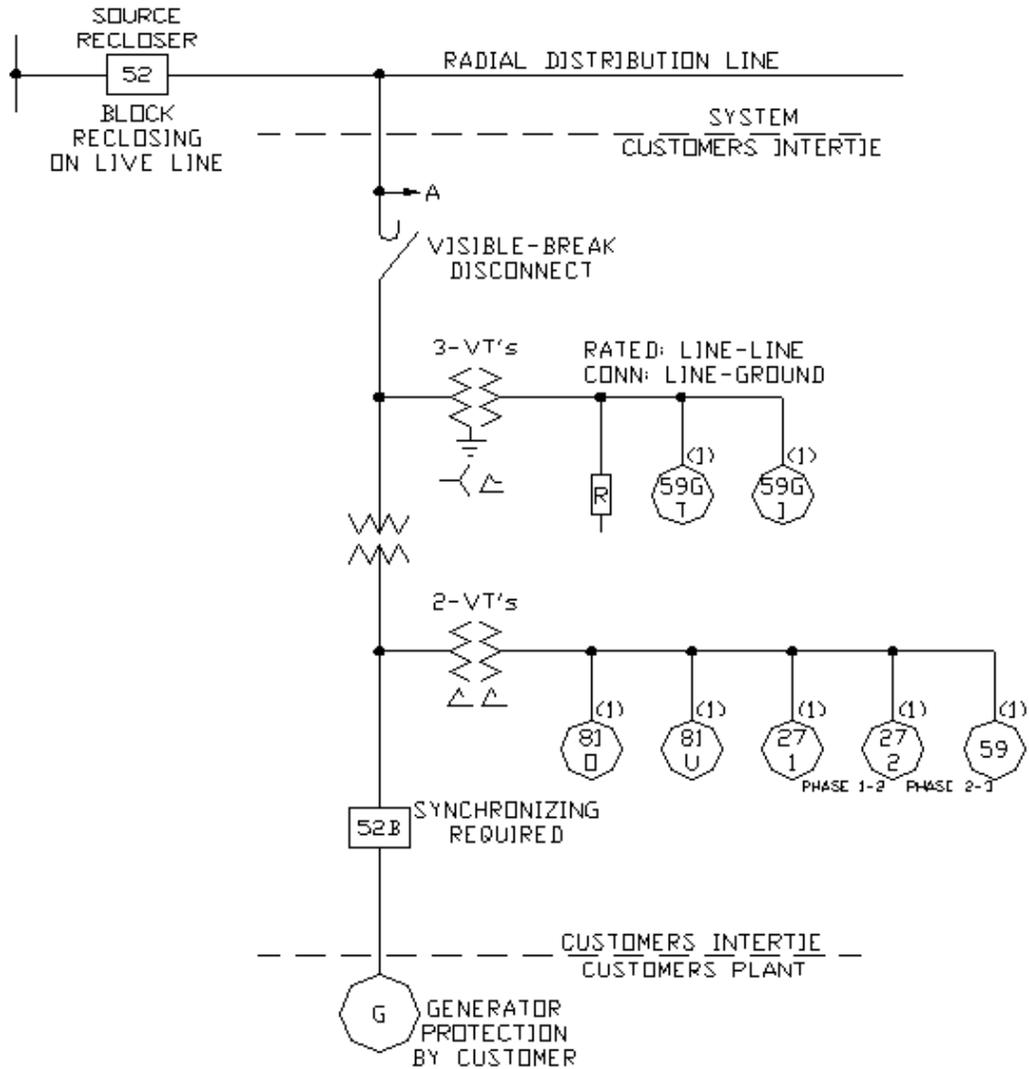
Utility Grade Relay: A relay that is constructed to comply with, as a minimum, the most current version of the following standards; ANSI/ IEEE C37.90, ANSI/ IEEE C37.90.1, ANSI/ IEEE C37.90.2, ANSI/ IEEE C37.90.3 and; IEEE C37.98 Seismic Testing (fragility) of Protective and Auxiliary Relays, ANSI C37.2 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).

Attachment 2(a): EMERA MAINE Typical Connection One-Line Diagram



TYPICAL INTERTIE PROTECTION
 SINGLE PHASE INTERCONNECTION
 10 KW OR LESS

Attachment 2(b): EMERA MAINE Typical Connection One-Line Diagram

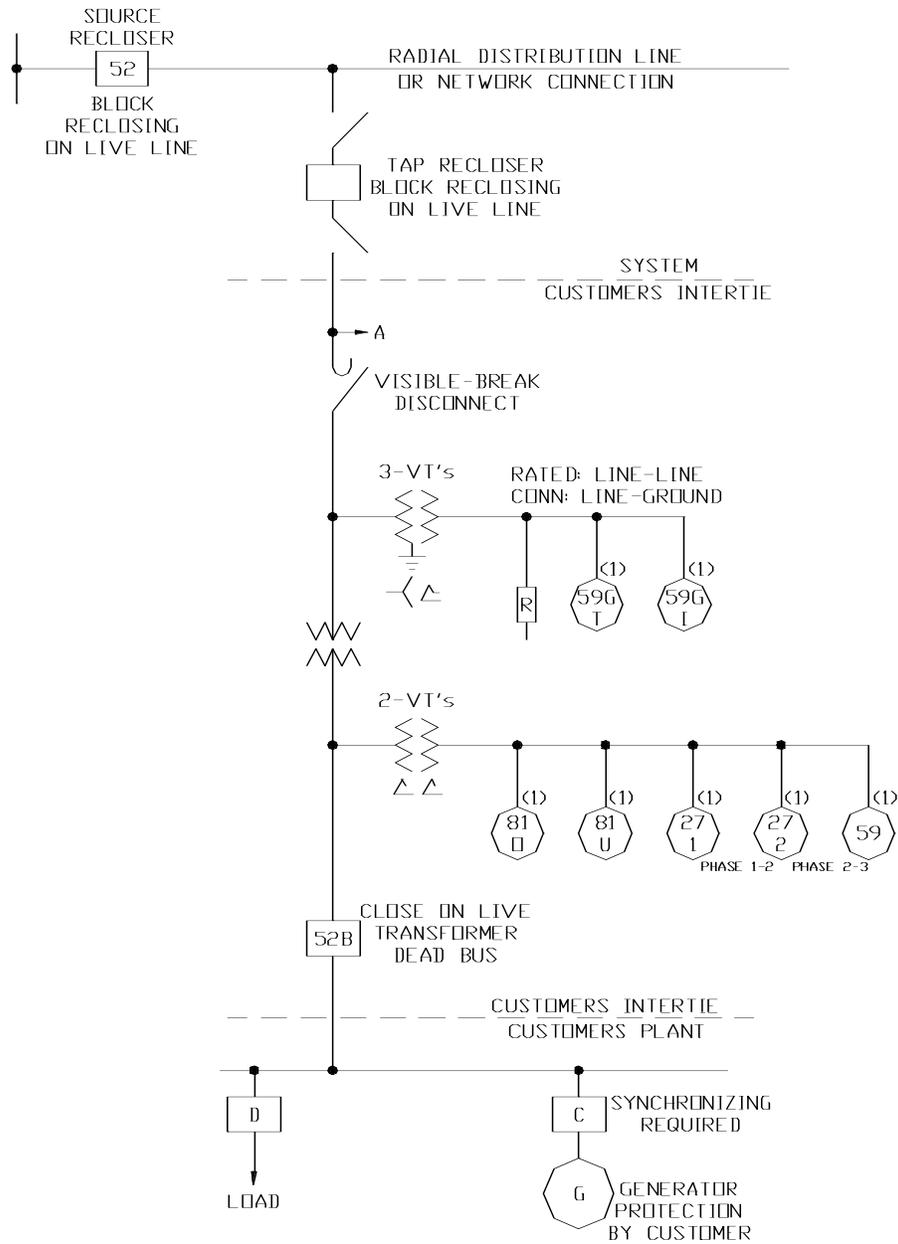


<u>DEVICE</u>	<u>FUNCTION</u>	<u>TRIPS</u>
81-O	OVERFREQUENCY	52B
81-U	UNDERFREQUENCY	52B
27-1&2	UNDERVOLTAGE-TIME & INSTANTANEOUS	52B
59	OVERVOLTAGE-TIME & INSTANTANEOUS	52B
59G/T	GROUND OVERVOLTAGE TIME	52B
59G/I	GROUND OVERVOLTAGE INSTANTANEOUS	52B

A - LOAD INTERRUPTING DEVICE
 52B - 'TIE' POWER CIRCUIT BREAKER
 R- 250 OHM, 200 WATT

INTERTIE PROTECTION
 SMALL 3 PHASE GENERATOR

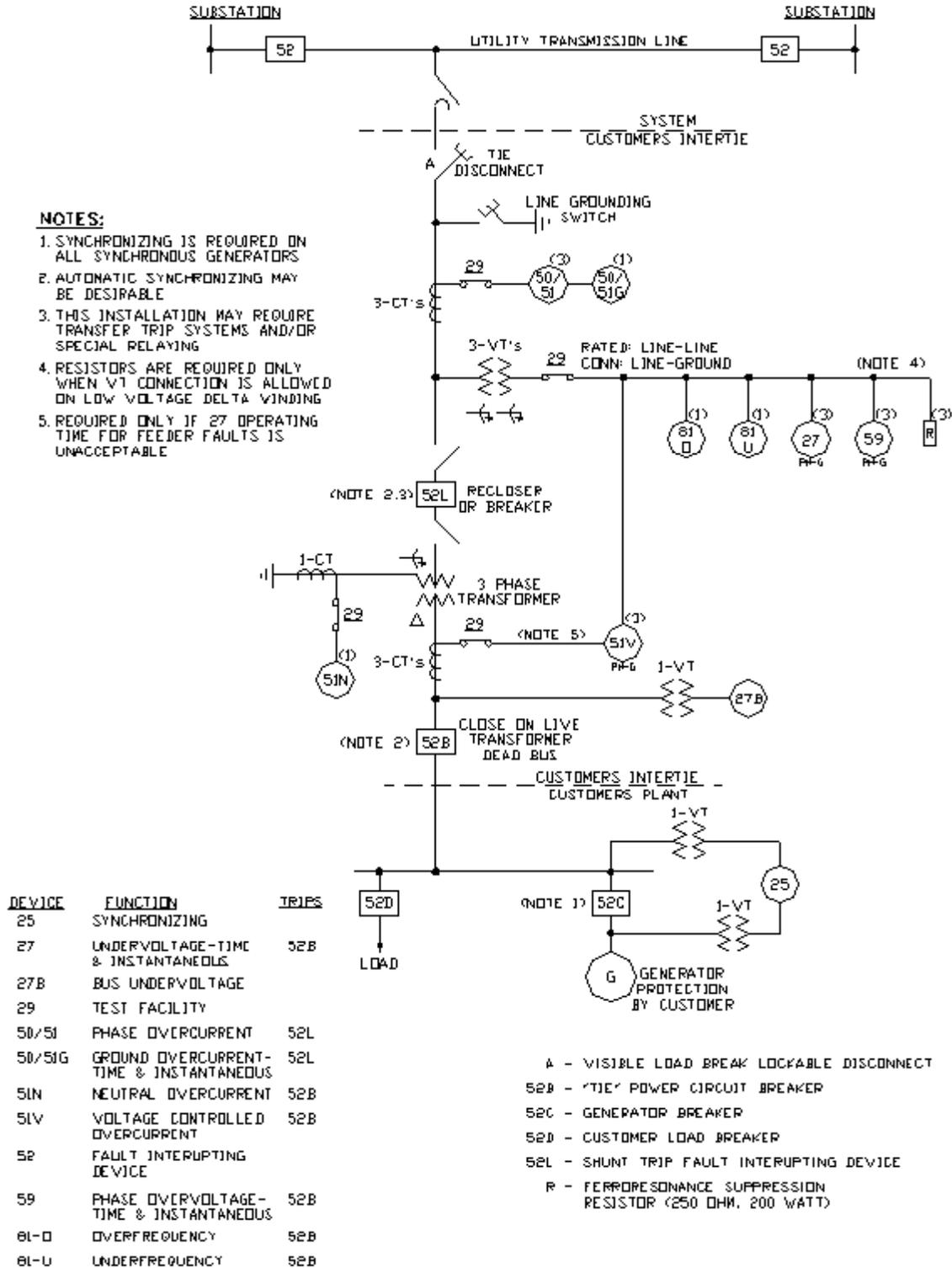
Attachment 2(c): EMERA MAINE Typical Connection One-Line Diagram



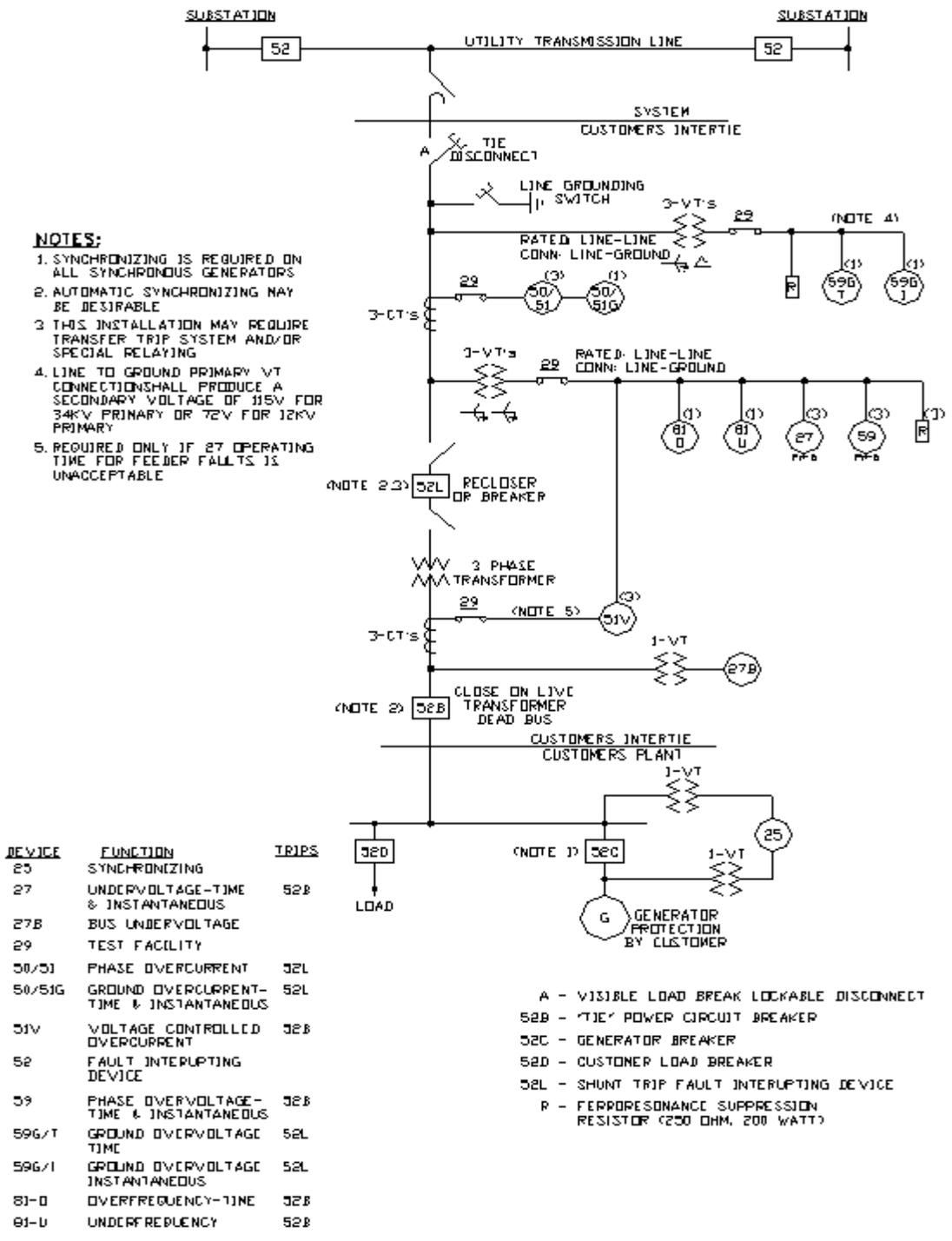
DEVICE	FUNCTION	TRIPS
81-O	OVERFREQUENCY	52B
81-U	UNDERFREQUENCY	52B
27-1&2	UNDERVOLTAGE-TIME & INSTANTANEOUS	52B
59	OVERVOLTAGE-TIME & INSTANTANEOUS	52B
59G/T	GROUND OVERVOLTAGE TIME	52B

A - LOAD INTERRUPTING DEVICE
 52B - "TIE" POWER CIRCUIT BREAKER
 R- 250 OHM, 200 WATT

Attachment 2(d): EMERA MAINE Typical Connection (w/ gnd) One-Line Diagram



Attachment 2(e): EMERA MAINE Typical Connection (no gnd) One-Line Diagram



Attachment 3: EMERA MAINE 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.

PUBLIC UTILITIES COMMISSION CHAPTER 324

Level 1: Inverter-Based Generators Not Greater 10kW

Application- Customer submits a completed application indicating which certified interconnection equipment the Customer intends to use. Within three (3) business days, Emera Maine acknowledges to the customer receipt of the application and notifies Customer that the application is complete or incomplete. If the application is incomplete, Emera Maine shall provide notice to the Customer that the application is incomplete and a written list detailing all information that must be provided to complete the application. The Customer will have ten (10) business days after receipt of the list to submit the listed information, or to request an extension of time to provide such information. Otherwise, the application will be deemed withdrawn. A Customer may pre-execute standard Interconnection Agreement for Level 1 and submit the application.

Applicable Screens- Screens 6A, 6E, 6F, 6I, 6J. For interconnections to distribution networks, proposed facilities must also pass screen 7A.

Time to Process Under Screens- Within ten (10) business days after Emera Maine notifies the Applicant that the application is complete, Emera Maine shall notify the Applicant whether the Customer-Generator Facility meets all the applicable screens above. If the Customer-Generator Facility fails one or more of the applicable screens, the Customer may request the application continue to be processed under Level 2, 3 or 4.

Approval- If a facility meets all of the applicable screens above, within three (3) days, Emera Maine shall send a partially executed Level 1 Interconnection Agreement (or a fully executed Interconnection Agreement where the Customer has pre-executed the Interconnection Agreement).

Execution of Agreement- An Applicant that receives an Interconnection Agreement shall execute the agreement and return it to Emera Maine at least five (5) business days prior to starting operation of the Customer-Generator Facility (unless Emera Maine does not so require or the Customer pre-executed the Interconnection Agreement). The applicant shall indicate the anticipated start date for operation of the Customer-Generator Facility, the Applicant shall provide at least five (5) business days notice to Emera Maine prior to the initiation of operations.

Default Approval- If Emera Maine does not notify a Level 1 Applicant in writing or by email whether the interconnection is approved or denied within twenty (20) business days after the receipt of an application; the interconnection shall be deemed approved. The 20 days shall begin on the date that Emera Maine send the written or e-mail notice that the application is received.

Application Fee- The fee for Level 1 Interconnection application is \$50.00.

Level 2: Generators Not Greater than 2MW

Application- Customer submits a completed application indicating which certified interconnection equipment the Customer intends to use. Within three (3) business days, Emera Maine acknowledges to the customer receipt of the application and notifies Customer that the application is complete or incomplete. If the application is incomplete, Emera Maine shall provide notice to the Customer that the application is incomplete and a written list detailing all information that must be provided to complete the application. The Customer will have ten (10) business days after receipt of the list to submit the listed information, or to request an extension of time to provide such information. Otherwise, the application will be deemed withdrawn.

Applicable Screens- Screens 6A, 6B, 6C, 6D, 6E, 6F, 6G, 6H, 6I, 6J. Interconnections to distribution networks must pass applicable screens under Section 7.

Time to Process Under Screens- Within fifteen (15) business days after Emera Maine notifies the Applicant that the application is complete, Emera Maine shall notify the Applicant whether the Customer-Generator Facility meets all the applicable screens 8B above.

Screens Failure- If the Customer-Generator Facility fails one or more of the applicable screens, then Emera Maine shall provide the Customer with detailed information on the reason or reasons for failure. The Customer may request the application continue to be processed under additional review (see below), Level 3 or Level 4. Despite the failure of one or more screens, Emera Maine at its sole option may approve the interconnection provided such approval is consistent with safety and reliability.

Approval- If a facility meets all of the applicable screens above or is otherwise approved by Emera Maine, within three (3) business days Emera Maine shall send a partially executed Interconnection Agreement.

Execution of Agreement- An Applicant that receives an Interconnection Agreement under 8E shall execute the agreement and return it to Emera Maine within three (3) business days or ten (10) business days prior to starting operation of the Customer-Generator Facility at the Customer's option. If Emera Maine requires an inspection of the Customer-Generator Facility, the Applicant shall provide at least five (5) business days notice to Emera Maine prior to the initiation of operations. The Customer shall not delay the return of an executed Interconnection Agreement more than ninety (90) days beyond the date shown in the original application for initial operations except by mutual agreement between Emera Maine and the Applicant.

Witness Testing- Emera Maine may require witnessing of the commissioning test. If witnessing of the commissioning test is required, this shall be stated in the Interconnection Agreement. The commissioning test shall be scheduled within the time frames in this section or on a date mutually agreeable to the Parties.

Additional Review- If a Customer-Generator Facility has failed to meet one or more of the Level 2 screens, but the initial review indicates that additional review may enable Emera Maine to determine that the Customer-Generator Facility can be interconnected consistent with safety, reliability and power quality. In such a case, Emera Maine shall offer to perform additional review to determine whether minor modifications to the electric distribution system (e.g., changing meters, fuses or relay settings) would enable the interconnection to be made consistent with safety, reliability and power quality. Emera Maine shall provide to the Applicant a non-binding, good faith estimate of the costs of such additional review, and/or such minor modifications. Emera Maine shall undertake the additional review or modifications only after the Applicant consents to pay for the review and/or modifications.

Application Fee- The fee for Level 2 interconnection applications is \$50.00 plus \$1.00 per kW of generator capacity.

Level 3: Non-Exporting Generators Not Greater than 10 MW

Application- Customer submits a completed application indicating which certified interconnection equipment the Customer intends to use. Within three (3) days, Emera Maine acknowledges to the customer receipt of the application and notifies Customer that the application is complete or incomplete. If the application is incomplete, Emera Maine shall provide notice to the Customer that the application is incomplete and a written list detailing all information that must be provided to complete the application. The Customer will have ten (10) business days after receipt of the list to submit the listed information, or to request an extension of time to provide such information. Otherwise, the application will be deemed withdrawn.

Applicable Screens- Screens 6B, 6C, 6D, 6E, 6F, 6G, 6H, 6I, 6J. Interconnections to distribution networks must pass applicable screens under Section 7. In addition, a Customer-Generator must use reverse power relays or otherwise ensure no export to Emera Maine's system.

Time to Process Under Screens- Within seventeen (17) business days after Emera Maine notifies the Applicant that the application is complete, Emera Maine shall notify the Applicant whether the Customer-Generator Facility meets all the applicable screens 10B above.

Screens Failure- If the Customer-Generator Facility fails one or more of the applicable screens, then Emera Maine shall provide the Customer with detailed information on the reason or reasons for failure. The Customer may request the application continue under Level 4. Despite the failure of one or more screens, Emera Maine at its sole option may approve the interconnection provided such approval is consistent with safety and reliability.

Approval- If a facility meets all of the applicable screens above or is otherwise approved by Emera Maine, within three (3) business days Emera Maine shall send a partially executed Interconnection Agreement.

Execution of Agreement- An Applicant that receives an Interconnection Agreement under 10E shall execute the agreement and return it to Emera Maine within three (3) business days or ten (10) business days prior to starting operation of the Customer-Generator Facility at the Customer's option. If Emera Maine requires an inspection of the Customer-Generator Facility, the Applicant shall provide at least five (5) business days notice to Emera Maine prior to the initiation of operations. The Customer shall not delay the return of an executed Interconnection Agreement more than ninety (90) days beyond the date shown in the original application for initial operations except by mutual agreement between Emera Maine and the Applicant.

Witness Testing- Emera Maine may require witnessing of the commissioning test. If witnessing of the commissioning test is required, this shall be stated in the Interconnection Agreement. The commissioning test shall be scheduled within the time frames in this section or on a date mutually agreeable to the Parties.

Application Fee- The fee for Level 3 interconnection applications is \$100.00 plus \$1.50 per kW of generator capacity.

Level 4: All Generators Not Subject to FERC Jurisdiction

Application- Customer-Generator submits standard application form for Level 4 interconnection; or a Customer's interconnection application is transferred from the Level 1, Level 2 or Level 3 procedures for failure to meet all of the requirements of those procedures.

Acknowledgement of Receipt- Emera Maine acknowledges to the interconnecting Customer receipt of the application or the transfer from the simplified or expedited interconnection procedures within three (3) business days.

Notification of Completeness- Emera Maine evaluates the application and notifies the Customer within ten (10) business days of receipt that the application is complete or incomplete. If the application is incomplete, Emera Maine shall provide notice to the Customer that the application is incomplete and a written list detailing all information that must be provided to complete the application. When the application is complete, Emera Maine will assign a queue position based on the date of completed application.

Queue Position- The queue position of each Interconnection Request will be used to determine the order of interconnection review in those circumstances where one pending interconnection application could affect the analysis of other pending interconnection applications as well as any cost responsibility for the facilities necessary to accommodate the generator interconnection. Queue Position is based on the date of receipt of a completed application.

Initial Review and Scoping- Emera Maine will conduct an initial review that includes a scoping meeting/discussion with the Customer (if necessary) within ten (10) business days of determination that an application is complete. At the scoping meeting Emera Maine will provide pertinent information such as: the available Fault Current at the proposed location, the existing peak loading on the lines in the general vicinity of the proposed generator, and the configuration of the distribution lines at the proposed point of interconnection. By mutual agreement of the Parties, the feasibility study, impact study or facilities study may be waived.

Feasibility Study Estimates- At the Customer's request and within five (5) business days of the scoping meeting, Emera Maine will provide a good faith estimate of the cost and time to undertake a feasibility study that provides a preliminary review of the potential impacts on the distribution system from the proposed interconnection. The feasibility study will provide a preliminary review of short circuit currents, including contribution from the proposed generator, and coordination and potential overloading of distribution circuit protection devices. Provided there are no violations found in the feasibility study, the impact study (below) may be waived.

Impact Study- Within ten (10) business days of the completion of the feasibility study, Emera Maine shall provide an impact study agreement, including the cost estimate for the impact study. Where the proposed interconnection may affect electric transmission or distribution systems other than that of Emera Maine where the interconnection is proposed, Emera Maine shall transfer the interconnection application to the relevant RTO or other transmission provider for processing under FERC interconnection rules.

Certified Generators- For generators that are certified, no review of the generator's protection is required. While Emera Maine may review a certified generator's protection scheme, it cannot charge for such review. Otherwise Emera Maine shall conduct a review a generator protective devices for adherence to IEEE Standard 1547.

Description of Impact Studies- Emera Maine will include in its compliance tariff a description of the various elements of an impact study it would typically undertake pursuant to this section, including:

1. Load-Flow Study
2. Short-Circuit Study
3. Circuit Protection and Coordination Study
4. Impact on System Operation
5. Stability Study (and the conditions that would justify including this element in the Impact Study)
6. Voltage-Collapse Study (and the conditions that would justify including this element in the Impact Study).

Start of Impact Study- Once the interconnecting Customer executes the impact study agreement and pays pursuant to the good faith estimate contained therewith, Emera Maine will conduct the interconnection impact study.

Minor System Modifications- If Emera Maine determines that electric system modifications required to accommodate the proposed interconnection are Minor System Modifications, the impact study will identify the scope and cost of the modifications as defined in the study results and no facilities study shall be required.

Substantial System Modification- If Emera Maine determines that the system modifications to the Emera Maine electric system are substantial, the results of the impact study will produce an estimate for the modification costs (within +/- 25 %). The detailed costs of, and the electric system modifications necessary to interconnect the Customer's proposed generator will be identified in a facilities study to be completed by Emera Maine.

Facilities Study Agreement- A facilities study agreement, with a good faith estimate of the cost of completing the facilities study, shall be submitted to the Customer for the Customer's approval.

Start of Facilities Study- Once the interconnecting Customer executes the facilities study agreement and pays pursuant to the terms thereof, Emera Maine will conduct the facilities study.

Notice of Facilities Study Completion- Within five (5) business days of completion of the impact and/or facilities study, Emera Maine shall send the Customer an executable Interconnection Agreement including a quote for any required electric system modifications.

Execution of Interconnection Agreement- Within thirty (30) days of the receipt of an Interconnection Agreement above, the Customer shall execute and return the Interconnection Agreement.

Installation Milestones- The facilities study shall indicate the milestones for completion of the Customer installation of its generator and the Emera Maine completion of any electric system modifications, and the milestones from the facilities study (if any) shall be incorporated into the Interconnection Agreement.

Generator Inspection- Emera Maine shall inspect the completed generator installation for compliance with requirements and attends any required commissioning tests pursuant to IEEE Standard 1547.

Notification of Approved Operation- Provided any required commissioning tests are satisfactory, Emera Maine shall notify the Customer in writing that operation of the generator is approved.

Notification of Changes to Initial Operations Date- The Customer shall notify Emera Maine if there is any anticipated change in the proposed date of initial interconnected operations of the generator.

Application and Other Fees- An application fee shall not exceed \$100.00 plus \$2.00 per kW capacity, as well as charges for actual time spent on the interconnection study. Costs for Emera Maine facilities necessary to accommodate the Customer's generator interconnection shall be the responsibility of the Customer.

Attachment 4: Screening Definitions

6A-For interconnection of a proposed generator to a radial distribution circuit, the aggregated generation, including the proposed generator, on the circuit will not exceed 15% of the line section annual peak load as most recently measured at the substation. A line section is that portion of the distribution system connected to a customer bounded by automatic sectionalizing devices or the end of the distribution line.

6B-The proposed generator, 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.

6C-The proposed generator, in aggregate with other generation on the distribution circuit, will not cause any distribution protective devices and equipment (including but limited to substation breakers, fuse cutouts, and line reclosers), or customer equipment on the system, to exceed 90% of the short circuit interrupting capability; nor is the interconnection proposed for a circuit that already exceeds 90% of the short circuit interrupting capability.

6D-The proposed generator is interconnected to the EPS as shown in the table below:

<u>Primary Distribution Line Config</u>	<u>Interconnect to Primary Distribution Line</u>
Three-Phase, three-wire-----	If a three-phase or single-phase Generator, interconnection must Be phase-to phase
Three-Phase, four-wire-----	If a three-phase (grounded) or Single-phase generator, Interconnection must be line-To-neutral

6E-If the proposed generator is to be interconnected on a single-phase shared secondary, then the aggregate generation capacity on the shared secondary, including the proposed generator, will not exceed 20 kilovolt-amperes (kVA).

6F-If the proposed generator is single-phase and is to be interconnected to a transformer center tap neutral of a 240-volt service, its addition will not create an imbalance between the two sides of the 240-volt service of more than 20% of nameplate rating of the service transformer.

6G-The proposed generator, in aggregate with other generation interconnected to the distribution low-voltage side of the substation transformer feeding the distribution circuit where the generator proposes to interconnect, will not exceed 10MW in an area where there are known or posted transient stability limitations to generating units located in the general electrical vicinity.

6H-The proposed generator's point of common coupling will not be on a transmission line.

6I-The generator cannot exceed the capacity of the customer's existing electrical service.

6J-No construction of facilities by EMERA MAINE on its own system shall be required to accommodate the generator.

7A-For interconnection of a proposed generator to a spot network circuit where the generator or aggregate of total generation exceeds 5% of the spot network's maximum load, the generator must utilize a protective scheme that will ensure that its currents flow will not affect the network protective devices, including reverse power relays or a comparable function.

7B-For interconnection of a proposed generator that utilizes inverter-based protective functions to an area network, the generator, in aggregate with other exporting generators interconnected on the load side of network protective devices, will not exceed the lesser of 10% of the minimum annual load on the network or 500kW, For a photovoltaic customer-generator facility without batteries, the 10% minimum shall be determined as a function of the minimum load occurring during an off-peak daylight period.

7C-For interconnection of generators to area networks that do not utilize inverter-based protective functions or inverter-based generators that do not meet the requirements of screen 7B above, the generator must utilize reverse power relays or other protection devices and/or methods that ensure no export of power from the customer's site including any inadvertent export that could adversely affect protective devices on the network circuit.

Attachment 5: 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
- IEEE Std C37.108-1989 (R2002), IEEE Guide for the Protection of Network Transformers
- IEEE Std C57.12.44-2000, IEEE Standard Requirements for Secondary Network Protectors
National Electrical Code, NFPA/ANSI 70, 2003
- NEMA MG 1-1998, Motors and Small Resources, Revision 3
- UL (Underwriters Laboratories) Std 1741, November 1, 2002, Inverters, Converters and Charge Controllers for Use in Independent Power Systems

- ANSI/ IEEE C37.90.3
- IEEE C37.98 Seismic Testing (fragility) of Protective and Auxiliary Relays
- ANSI C37.2 Electric Power System Device Function Numbers
- IEC 255-21-1 Vibration
- IEC 255-22-2 Electrostatic Discharge
- IEC 255-5 Insulation (Impulse Voltage Withstand)
- Maine Public Utilities Commission, 65-407, Chapter 324: Small Generator Interconnection Procedures