

**Holland Board of Public Works**

***Electric Generator Interconnection Requirements  
and Study Agreement***

***Projects with  
Aggregate Generator Output  
Under 30 kW***

***Effective 10-1-2008***

## CONTENTS

INTERCONNECTION PROCESS.....	1
Interconnection Application.....	1
Interconnection Study.....	2
Interconnection and Operating Agreement.....	2
Project Design and Construction.....	2
Ongoing Operations.....	2
TECHNICAL REQUIREMENTS.....	3
Major Component Design Requirements.....	3
Data.....	3
Isolating Transformer(s).....	3
Isolation Device.....	3
Interconnection Lines.....	4
Relaying Design Requirements.....	4
Momentary Paralleling.....	4
Automatic Reclosing.....	4
Single-Phase Sectionalizing.....	4
Specific Requirements by Generator Type.....	5
Synchronous Projects.....	5
Induction Projects.....	5
Inverter-Type Projects.....	5
Relay Setting Criteria.....	5
Maintenance and Testing.....	5
Installation Approval.....	5
Miscellaneous operational Requirements.....	6
Operating in Parallel.....	6
Reactive Power Control.....	7
Site Limitations.....	7
Revenue Metering Requirements.....	7
Non-Flow-back Projects.....	7
Flow-back Projects.....	8
Communication Circuits.....	8

## **CONTENTS**

- APPENDIX A INTERCONNECTION APPLICATION**
- APPENDIX B SYNCHRONOUS AND INDUCTION GENERATORS – REQUIRED DATA**
- APPENDIX C INVERTER-TYPE GENERATORS – REQUIRED DATA**
- APPENDIX D INTERCONNECTION STUDY AGREEMENT**
- APPENDIX E INTERCONNECTION AND OPERATING AGREEMENT**
- APPENDIX F CONTACT LIST**

# INTERCONNECTION PROCESS

## The Interconnection Process

This section outlines the process for interconnecting Projects with aggregate output less than 30 kW to the Utility electric system. This includes both new Projects and modifications to existing Projects. The general Process is shown in Figure 1.

The Utility is required to complete all of its obligations for interconnection of the Project to the Utility system within 2 weeks from the time a complete Interconnection Application is received by the Utility.

A completed Interconnection application consists of an application, data (Appendix B or C), and filing fee.

Delays that are the responsibility of the Project Developer or attributable to the time lapse while the Utility diligently seeks to secure necessary rights-of-way, governmental permitting, zoning requirements, etc, will not be counted in the time to meet the 2 week deadline. The Utility shall have no responsibility to pursue court action to obtain these items.

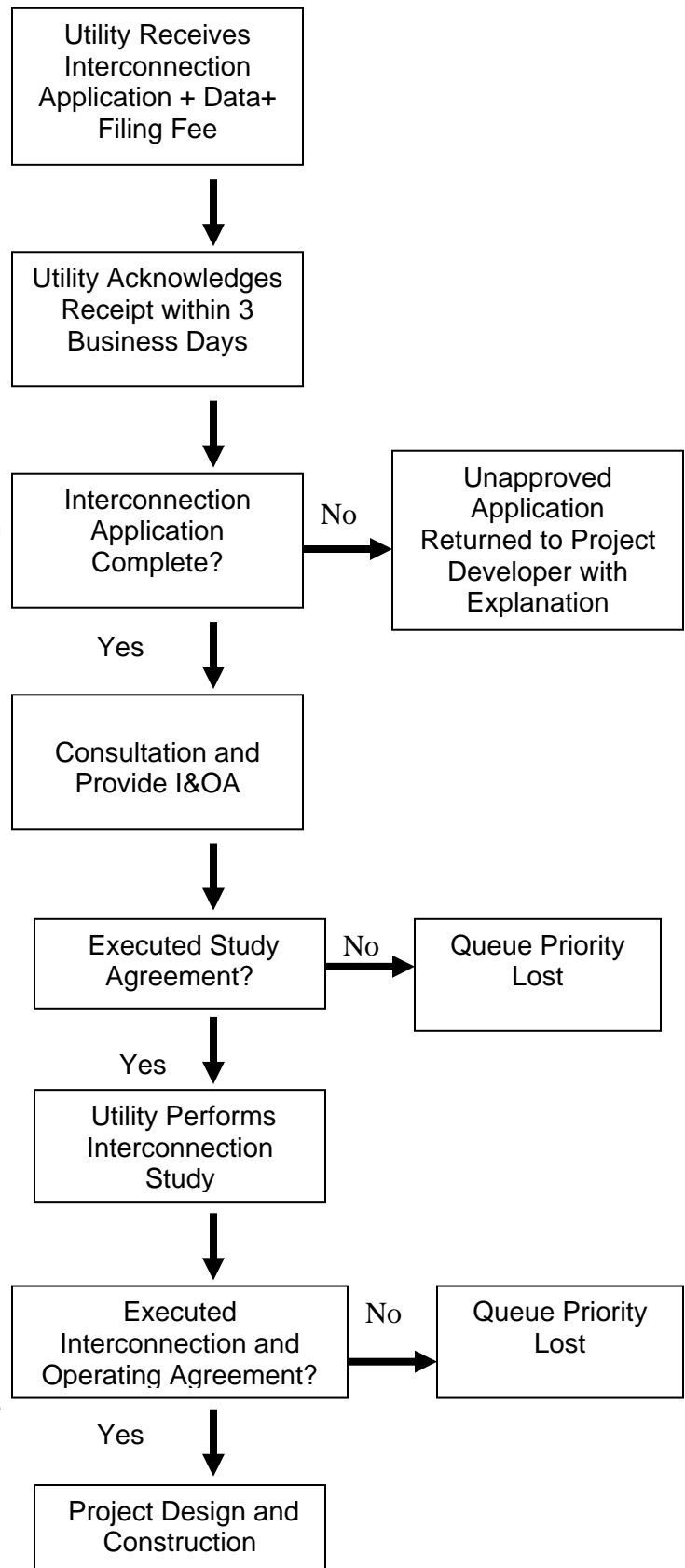
### Interconnection Application

The Project Developer must first submit an Interconnection Application to the Utility. A separate application is required for each Project or Project site. A blank Interconnection Application can be found in Appendix A. A list of the required interconnection data, depending on the capacity rating and type of generation, can be found in Appendixes B and C.

A complete submittal of required interconnection data and filing fee as noted in the Fee Schedule must accompany the Interconnection Application. The Utility will notify the Project Developer within 3 business days of receipt of an Interconnection Application. If any portion of the Interconnection Application, data submittal, or filing fee is incomplete and/or missing, the unapproved Interconnection Application will be sent back to the Project Developer with the deficiencies clearly identified.

Once the utility has accepted an interconnection Application, the Project is assigned a position in the Project queue maintained by the Utility. The Project position in the Project queue is determined by the date the Utility received the accepted Interconnection Application. The Utility will provide the Project Developer up to two hours of consultation related to the Project's interconnection to the Utility system and will include a good faith estimate of the Utility's charges to complete the

Figure 1: The Interconnection Process



## INTERCONNECTION PROCESS

Interconnection, including the estimated study fees, based on the information available to the Utility at that time.

### ***Interconnection Study***

The Utility will perform an Interconnection Study to determine the impact of the Project on the Utility's system, and the Utility system modifications required for safe and reliable interconnection of the Project to the Utility's system. The Project Developer is required to sign the interconnection Study Agreement found in Appendix D and is encouraged to return the signed interconnection Study Agreement to the Utility with the completed interconnection Application to avoid delays in the interconnection process. Any delay in execution of the interconnection Study Agreement will not toll the interconnection deadlines.

The utility will charge the project Developer for the costs associated with completion of the Interconnection Study. The costs will not exceed the lesser of the following:

- 1) Five percent of the estimated total cost of the Project, or
- 2) \$10,000

Interconnection Study fees are not required if the Interconnection Study determines that the Project's aggregate export capacity is less than 15% of the line section peak load and the project does not contribute more than 25% of the maximum short circuit at the Point of Common Coupling (PCC) as defined by IEEE 1547.

It is typical for Projects less than 30 kW to be less than 15% of the line section peak load and less than 25% of the maximum short circuit current at the PCC.

### ***Interconnection and Operating Agreement***

The Utility will submit an Interconnection and Operating Agreement (I&OA) to the Project Developer, as soon as practical, after the 2 hour consultation described earlier. A sample Interconnection and Operating Agreement can be found in Appendix E.

The Interconnection and Operating Agreement will cover matters customarily addressed in such agreements in accordance with Good Utility Practice, including, without limitation, construction of facilities, system operation, interconnection cost and billing, defaults and remedies, insurance, and liability. All Utility costs associated with making modifications to its distribution system will be paid by the project Developer.

Any delay in execution of the interconnection and Operating Agreement will not count toward the interconnection deadlines.

### ***Project Design and Construction***

After the Interconnection and Operating Agreement is executed, the Utility will proceed to acquire necessary rights-of-way, procure required equipment, and design and construct the Interconnection Facilities.

### ***Ongoing Operations***

The project Developer and Utility will exchange contact information and update this information from time to time. A sample Contact List can be found in Appendix F.

## TECHNICAL REQUIREMENTS

### Technical Requirements

The following discussion details the technical requirements for interconnection of Projects less than 30 kW. For projects within this capacity rating range, the Utility has made a significant effort to simplify the technical requirements. This effort has resulted in adoption of IEEE Std. 1547, Standard for Interconnecting Distributed Resources with Electric Power Systems, being incorporated herein by reference.

Certain requirements, as specified by this document, must be met to provide compatibility between the project and the utility's electric system, and to assure that the safety and reliability of the electric system is not degraded by the interconnection.

Upgraded revenue metering may be required for the Project.

### ***Major component Design Requirements***

The data requested in Appendix B or C for all major equipment and relaying proposed by the Project Developer, must be submitted as part of the initial application for review and approval by the Utility. The Utility may request additional data be submitted as necessary during the study phase to clarify the operation of the Project.

Once installed, the interconnection equipment must be reviewed and approved by the Utility prior to being connected to the Utility's electric system and before Parallel Operation is allowed.

### **Data**

The data that the Utility requires to evaluate the proposed interconnection is documented on a "fill in the blank" checklist by generator type in Appendices B and C.

A site plan, one-line diagrams, and interconnection protection system details of the Project are required as part of the application data. The generator manufacturer supplied data package should also be supplied.

### **Isolating Transformer(s)**

If a project Developer installs an isolating transformer, the transformer must comply with the current ANSI Standard C57.12.

The type of generation and electrical location of the interconnection will determine the isolating transformer connections. Allowable connections are detailed in the "Specific Requirements by Generator Type" section. Note: Some Utilities do not allow an isolation transformer to be connected to a grounded Utility system with an ungrounded secondary (Utility side) winding configuration, regardless of the Project type. Therefore, the Project Developer is encouraged to consult with the Utility prior to submitting an application.

### **Isolation Device**

After review, this device may not be required by the Utility. If required and/or installed, this device would be placed at the Point of Common Coupling (PCC). It can be a circuit breaker, circuit switcher, pole top switch, load-break disconnect, etc., depending on the electrical system configuration. The following are required of the isolation device:

- Must be approved for use on the Utility system.
- Must comply with current relevant ANSI and/or IEEE Standards.
- Must have load break capability, unless used in series with a three-phase interrupting device.

## TECHNICAL REQUIREMENTS

- Must be rated for the application.
- If used as part of a protective relaying scheme, it must have adequate interrupting capability. The Utility will provide maximum short circuit currents and X/R ratios available at the PCC upon request.
- Must be operable and accessible by the Utility at all times (24 hours a day, 7 days a week)
- The Utility will determine if the isolation device will be used as a protective tagging point. If the determination is so made, the device must have a visible open break, provisions for padlocking in the open position, and it must be gang operated. If the device has automatic operation, the controls must be located remote from the device.

### **Interconnection Lines**

Any new line construction to connect the Project to the Utility's electric system will be undertaken by the Utility at the Project Developer's expense.

### ***Relaying Design Requirements***

Regardless of the technology of the interconnection, for simplicity for all projects in this capacity rating range, the interconnection relaying system must be certified by a nationally recognized testing laboratory to meet IEEE Std. 1547. The date submitted for review must include information from the manufacturer indicating such certification, and the manufacturer must placard the equipment such that a field inspection can verify the certification.

A copy of this standard may be obtained (for a fee) from the Institute of Electrical and Electronics Engineers ([www.ieee.org](http://www.ieee.org)).

### **Momentary Paralleling**

For situations where the project will only be operated in parallel with the Utility's electric system for a short duration (100 milliseconds or less), as in make-before-break automatic transfer scheme, no additional relaying is required. Such momentary paralleling requires a modern integrated Automatic Transfer Switch (ATS) system, which is incapable of paralleling the Project with the Utility's electric system. The ATS must be tested, verified, and documented by the Project Developer for proper operation at least every 2 years. The Utility may be present during this testing.

### **Automatic Reclosing**

The Utility employs automatic multiple-shot reclosing on most of the utility's circuit breakers and circuit reclosers to increase the reliability of service to its customers. Automatic single-phase overhead reclosers are regularly installed on distribution circuits to isolate faulted segments of these circuits.

The Project Developer is advised to consider the effects of Automatic Reclosing (both single-phase and three-phase) to assure that the Project's internal equipment will not be damaged. In addition to the risk of damage to the Project, and out-of-phase reclosing operation may also present a hazard to utility equipment since this equipment may not be rated or built to withstand this type of reclosing. The Utility will determine relaying and control equipment that needs to be installed to protect its own equipment from out-of-phase reclosing. Installation of this protection will be undertaken by the Utility at the project Developer's expense.

### **Single-Phase Sectionalizing**

The Utility also installs single-phase fuses and/or reclosers on its distribution circuits to increase the reliability of service to its customers. Three-phase generator installations may require replacement of fuses and/or single-phase reclosers with three-phase circuit breakers or circuit reclosers at the project Developer's expense.

## TECHNICAL REQUIREMENTS

### Specific Requirements by Generator type

#### Synchronous projects

An isolation transformer may be required for three-phase Synchronous Generator Facilities. Except as noted below, the isolation transformer must be incapable of producing ground fault current to the Utility system; any connection except delta primary (Project side), grounded-wye secondary (Utility side) is acceptable. A grounded-wye-grounded - wye transformer connection is acceptable only if the Project's single line-to-ground fault current contribution is less than the Project's three-phase fault current contribution at the PCC. Protection must be provided for internal faults in the isolating transformer; fuses are acceptable.

For a sample One-Line Diagram of this type of facility, see Appendix B.

#### Induction Projects

For three-phase installations, any isolation transformer connection is acceptable except grounded-wye (Utility side), delta (Project side). Protection must be provided for internal faults in the isolating transformer; fuses are acceptable. The utility does not require the Project Developer to provide any protection for Utility system ground faults.

For a sample one-Line Diagram of this type of facility, see Appendix B.

#### Inverter-Type Projects

No isolation transformer is required between the generator and the secondary distribution connection. If an isolation transformer is used for three-phase installations, any isolation transformer connection is acceptable except grounded-wye (Utility side), delta (Project side). Protection must be provided for internal faults in the isolating transformer; fuses are acceptable. The Utility does not require the Project Developer to provide any protection for Utility system ground faults.

For a sample one-Line Diagram of this type of facility, see Appendix C.

#### Relay Setting Criteria

The relay settings for Projects less than 30 kW must conform to the values specified in IEEE Std. 1547.

#### Maintenance and Testing

The Utility reserves the right to test the relaying and control equipment that involves protection of the Utility's electric system whenever the Utility determines a reasonable need for such testing exists.

The Project Developer is solely responsible for conducting and documenting proper periodic maintenance on the generating equipment and its associated control, protective equipment, interrupting devices, and main Isolation Device, per manufacturer recommendations.

Routine and maintenance checks of the relaying and control equipment must be conducted in accordance with provided written test procedures which are required by IEEE Std. 1547, and test reports of such testing shall be maintained by the Project Developer and made available for Utility inspection upon request. [Note – IEEE 1547 requires that testing be conducted in accordance with written test procedures, and the nationally recognized testing laboratory providing certification will require that such test procedures be available before certification of the equipment.]

#### Installation Approval

The Project Developer must provide the Utility with 5 business days advance written notice of when the Project will be ready for inspection, testing, and approval.

## TECHNICAL REQUIREMENTS

Prior to final approval for Parallel Operation, the Utility reserves the right to inspect the Project and require action to assure conformance to the requirements stated herein.

### ***Miscellaneous Operational Requirements***

Miscellaneous requirements include synchronizing equipment for Parallel Operation, reactive requirements, and system stability limitations.

### **Operating in Parallel**

The Project Developer will be solely responsible for the required synchronizing equipment and for properly synchronizing the Project with the Utility's electric system.

Voltage fluctuation at the PCC during synchronization is limited by IEEE Std. 1547.

These requirements are directly concerned with the actual operation of the Project with the Utility:

- The Project may not commence parallel operation until approval has been given by the Utility. The completed installation is subject to inspection by the Utility prior to approval. Preceding this inspection, all contractual agreements must be executed by the Project Developer.
- The Project must be designed to prevent the Project from energizing into a de-energized Utility line. The Project's circuit breaker or contactor must be blocked from closing in on a de-energized circuit.
- The project shall discontinue parallel operation with a particular service and perform necessary switching when requested by the Utility for any of the following reasons:
  1. When public safety is being jeopardized.
  2. During voltage or loading problems, system emergencies, or when abnormal sectionalizing or circuit configuration occurs on the utility system.
  3. During scheduled shutdowns of Utility equipment that are necessary to facilitate maintenance or repairs. Such scheduled shutdowns shall be coordinated with the Project.
  4. In the event there is demonstrated electrical interference (i.e. Voltage Flicker, Harmonic Distortion, etc.) to the Utility's customers, suspected to be caused by the Project, and such interference exceeds then current system standards, the Utility reserves the right, at the Utility's initial expense, to install special test equipment as may be required to perform a disturbance analysis and monitor the operation and control of the Project to evaluate the quality of power produced by the Project. In the event that no standards exist, then the applicable tariffs and rules governing electric service shall apply. If the Project is proven to be the source of the interference, and that interference exceeds the Utility's standards or generally accepted industry standards, then it shall be the responsibility of the Project Developer to eliminate the interference problem and to reimburse the Utility for the costs of the disturbance monitoring installation, removal, and analysis excluding the cost of the meters or other special test equipment.
  5. When either the project or its associated synchronizing and protective equipment is demonstrated by the Utility to be improperly maintained, so as to present a hazard to the Utility system or its customers.

## TECHNICAL REQUIREMENTS

6. Whenever the project is operating isolated with other Utility customers, for whatever reason.
7. Whenever the Utility notifies the Project Developer in writing of a claimed non-safety related violation of the Interconnection Agreement and the Project Developer fails to remedy the claimed violation within ten working days of notification, unless within that time either the Project Developer files a complaint with the Board of Directors of the Holland Board of Public Works seeking resolution of the dispute or the Project Developer and Utility agree in writing to a different procedure.

If the Project has shown an unsatisfactory response to requests to separate the generation from the Utility system, the Utility reserves the right to disconnect the Project from parallel operation with the Utility electric system until all operational issues are satisfactorily resolved.

### **Reactive Power Control**

Synchronous generators that will operate in the Flow-back Mode must be dynamically capable of providing 0.90 power factor lagging (delivering reactive power to the Utility) and 0.95 power factor leading (absorbing reactive power from the Utility) at the Point of Receipt. The Point of Receipt is the location where the Utility accepts delivery of the output of the project. The Point of Receipt can be the physical location of the billing meters or a location where the billing meters are not located, but adjusted for line and transformation losses.

Induction and Inverter-Type Projects that will operate in the Flow-back Mode must provide for their own reactive needs (steady state unity power factor at the Point of Receipt). To obtain unity power factor, the Induction or Inverter-Type Project can:

1. Install a switchable Volt-Ampere reactive (VAR) supply source to maintain unity power factor at the Point of Receipt; or
2. Provide the Utility with funds to install a VAR supply source equivalent to that required for the Project to attain unity power factor at the Point of Receipt at full output.

There are no interconnection reactive power capability requirements for Synchronous Induction, and Inverter-Type Projects that will operate in the Non-Flow-back Mode. The utility's existing rate schedules, incorporated herein by reference, contain power factor adjustments based on the power factor of the metered load at these facilities.

### **Site Limitations**

The Project Developer is responsible for evaluating the consequences of unstable generator operation or voltage transients on the Project equipment and determining, designing, and applying any relaying which may be necessary to protect that equipment. This type of protection is typically applied on individual generators to protect the generator facilities.

The utility will determine if operation of the Project will create objectionable voltage flicker and/or disturbances to other Utility customers and develop any required mitigation measures at the Project Developer's expense.

### ***Revenue metering Requirements***

The Utility will own, operate, and maintain all required billing metering equipment at the Project Developer's expense.

### **Non-Flow-back Projects**

A Utility meter will be installed that only records energy deliveries to the Project.

## TECHNICAL REQUIREMENTS

### **Flow-back Projects**

Special billing metering will be required. The Project Developer may be required to provide, at no cost to the Utility, a dedicated dial-up voice-grade circuit (POTS line) to allow remote access to the billing meter by the Utility. This circuit shall be terminated within ten feet of the meter involved.

The Project Developer shall provide the Utility access to the premises at all times to install, turn on, disconnect, inspect, test, read, repair, or remove the metering equipment. The Project Developer may, at its option, have representative witness this work

The metering installations shall be constructed in accordance with the practices, which normally apply to the construction of metering installations for residential, commercial, or industrial customers. For Projects with multiple generators, metering on each generator may be required. When practical, multiple generators may be metered at a common point provided the metered quantity represents only the gross generator output.

The Utility shall supply to the Project Developer all required metering equipment and the standard detailed specifications and requirements relating to the location, construction, and access of the metering installation and will provide consultation pertaining to the meter installation as required. The Utility will endeavor to coordinate the delivery of these materials with the Project Developer's installation schedule during normal scheduled business hours.

The Project Developer may be required to provide a mounting surface for the metering equipment. The mounting surface and location must meet the Utility's specifications and requirements.

The responsibility for installation of the equipment is shared between the Utility and the Project Developer. The Project Developer may be required to install some of the metering equipment on its side of the PCC, including instrument transformers, cabinets, conduits, and mounting surfaces. The Utility shall install the meters and communication links. The Utility will endeavor to coordinate the installation of these items with the Project Developer's schedule during normal scheduled business hours.

**APPENDIX A**

**INTERCONNECTION APPLICATION**

**GENERATOR INTERCONNECTION APPLICATION**  
**AGGREGATE GENERATOR OUTPUT BELOW 30 kW**

1. The undersigned Project Developer submits this Generator Interconnection Application and appropriate filing fee to interconnect a new Project to the Utility Electric System or to increase the capacity of an existing Project interconnected to the Utility Electric System.
2. A project Developer requesting interconnection or an increase in the capacity of an existing Project to the Utility electric System must provide the following information:
  - a. Completed Interconnection Application Data sheet appropriate for the capacity rating and type of generating unit(s), as found in Utility's Generator Interconnection Requirements (Interconnection Application Data sheet, found in Appendix B or C, must be attached to this Interconnection Application).
  - b. Description of the equipment configuration and proposed interconnection one-line diagram (one-line diagram must be attached to this Interconnection Application).
  - c. Project Developer (Single Point of contact):

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

Address: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Fax Number: \_\_\_\_\_

E-mail Address: \_\_\_\_\_

Project Site Address: \_\_\_\_\_

3. This Generator Interconnection application shall be directed to the Utility representative as indicated below:

Superintendent of Electric Transmission & Distribution  
Holland Board of Public Works  
625 Hastings Avenue  
Holland, MI 49423

4. I, the undersigned and authorized representative of the Project, submit this Generator Interconnection Application and required technical data for the Utility. I understand that upon acceptance, the Utility shall subsequently provide an Interconnection Study Agreement, if said Interconnection Study is determined to be necessary. The Interconnection Study Agreement will include the Scope of the Interconnection Study. I also understand that I shall be required to furnish certain required technical data as requested by the Utility in support of this study and reimburse the Utility for its study expenses.

Authorized Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

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

Company Name: \_\_\_\_\_

Date: \_\_\_\_\_

## **APPENDIX B**

# **SYNCHRONOUS AND INDUCTION GENERATORS AGGREGATE GENERATION LESS THAN 30 kW**

## **REQUIRED DATA**





**SYNCHRONOUS OR INDUCTION GENERATORS – AGGREGATE < 30 kW  
INTERCONNECTION APPLICATION DATA FOR: \_\_\_\_\_  
PROVIDED BY: \_\_\_\_\_ DATE: \_\_\_\_\_**

Instructions: Attach data sheets as required. Indicate in the table below the page number of the attached data on which the requested information is provided.

**General Information**

<b>Item No</b>	<b>Data Description</b>	<b>Attached Page No</b>
1	Flow-back or Non-Flow-back	
2	Project Type (Base load, peaking, intermediate)	
3	Site Plan	
4	Simple One-Line Diagram(s) for project and Project Load	
5	Detained One-Line Diagram(s) for Project	
6	Energization Date for Project Interconnection Facilities	
7	First parallel Operation Date for Testing	
8	Project Commercial Operation Date	
9	Estimated Project Cost	

The following information on these system components shall appear on the preliminary One-Line Diagram, including manufacturer make and model for the items listed below:

- Breakers – Rating, location and normal operating status (open or Closed)
- Buses – Operating voltage
- Capacitors – Size of bank in kVAR
- Current Transformers – Overall ratio, connected ratio
- Fuses – normal operating status, rating (Amps), type
- Generators – Capacity rating (kVA), location, type, method of grounding
- Grounding Resistors – Size (ohms), current (Amps)
- Isolating transformers – Capacity rating (kVA), location, impedance, voltage ratings, primary and secondary connections and method of grounding
- Potential Transformers – Ratio, connection
- Reactors – Ohms/phase
- Relays – Types, quantity, IEEE device number, operator lines indicating the device initiated by the relays.
- Switches – Location and normal operating status (open or closed), type, rating
- Tagging Point – Location, identification

**SYNCHRONOUS OR INDUCTION GENERATORS – AGGREGATE < 30 kW  
 INTERCONNECTION APPLICATION DATA FOR: \_\_\_\_\_  
 PROVIDED BY: \_\_\_\_\_ DATE: \_\_\_\_\_**

Instructions: Attach data sheets as required. Indicate in the table below the page number of the attached

Data (manufacturer’s data where appropriate) on which the requested information is provided. Provide one table for each unique generator.

**Electric Generator(s) at the Project: Generator No \_\_\_\_\_**

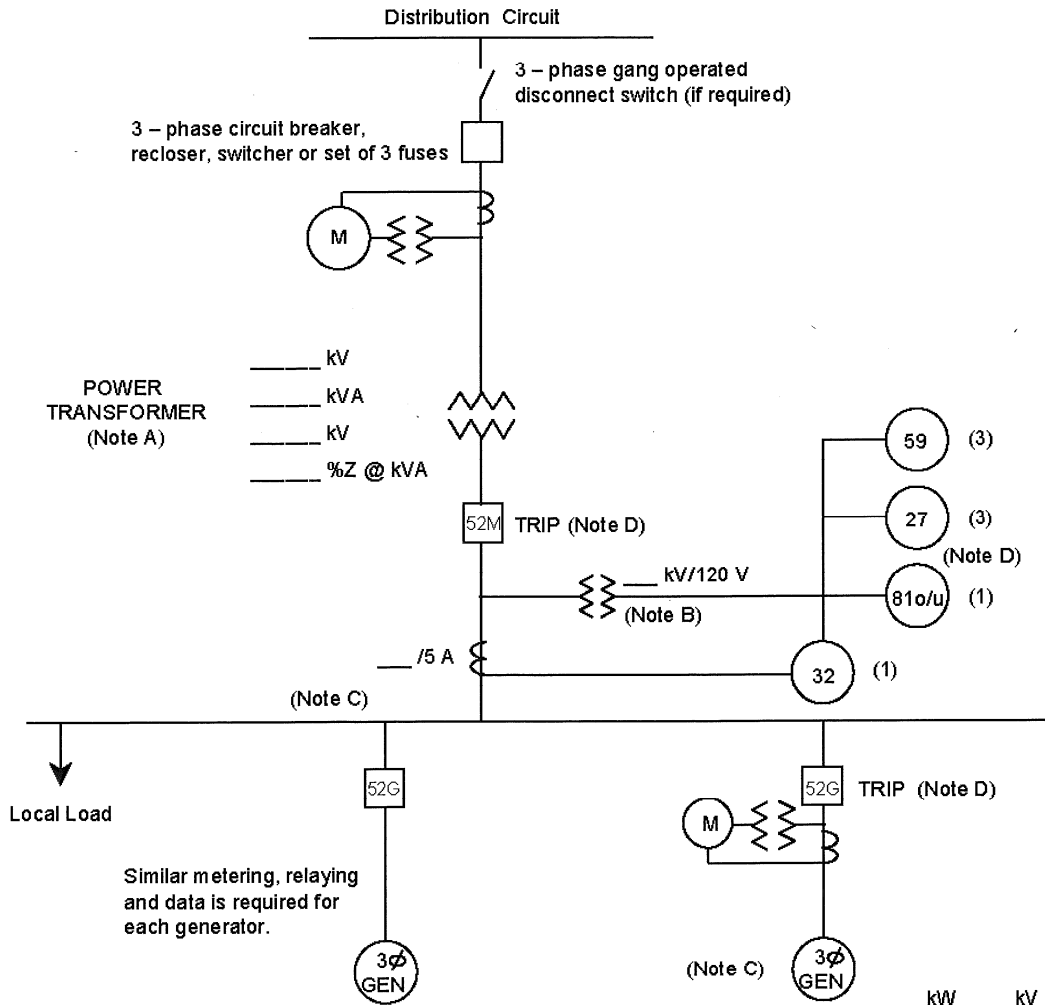
<b>Item No</b>	<b>Data Value</b>	<b>Data Description</b>	<b>Attached Page No</b>
1		Generator type (synchronous or induction)	
2		Generator nameplate Voltage	
3		Generator Nameplate Watts or Volt-Amperes	
4		Generator Nameplate Power Factor (pf)	
5		Short Circuit current contribution from generator at the Point of Common Coupling (single-phase and three-phase)	
6		National Recognized Testing Laboratory Certification	
7		Written Commissioning Test procedure	

## **APPENDIX C**

### **INVERTER-TYPE GENERATORS AGGREGATE GENERATION LESS THAN 30 kW**

#### **REQUIRED DATA**

**ONE-LINE REPRESENTATION  
TYPICAL ISOLATION AND FAULT PROTECTION FOR INVERTER GENERATOR INSTALLATIONS  
LESS THAN 30 kW**



**LEGEND**

- 27 Undervoltage
- 32 Reverse Power (not required for sellback)
- 59 Overvoltage
- 81o/u Over/Underfrequency

**NOTES**

- A) See technical requirements for permissible connection configurations and protection. Transformer connections proposed shall be shown on the one-line diagram by the Project Developer. Transformer connection and secondary grounding to be approved by Utility.
- B) VTs for 59, 27, 81o/u and 32 are shown connected on the primary (Project side) of the power transformer, but may instead be connected on the secondary (Utility side). IEEE std 1547 requirements for voltage and frequency must be met at the PCC. IEEE Std. 1547 permits the VTs to be connected at the point of generator connection in certain cases.
- C) Main breaker protection, generator protection and synchronizing equipment are not shown.
- D) Trip of all 52G breakers or the 52M breaker is acceptable, depending upon whether the Project Developer wants to serve its own isolated load after loss of Utility service.

**INVERTER-TYPE GENERATORS – AGGREGATE < 30 kW  
INTERCONNECTION APPLICATION DATA FOR: \_\_\_\_\_**

**PROVIDED BY: \_\_\_\_\_ DATE: \_\_\_\_\_**

Instructions: Attach data sheets as required. Indicate in the table below the page number of the attached data on which the requested information is provided.

**General Information**

<b>Item No</b>	<b>Data Description</b>	<b>Attached Page No</b>
1	Flow-back or Non-Flow-back	
2	Project Type (Base load, peaking, intermediate, other)	
3	Site Plan	
4	Simple One-Line Diagram(s) for Project and Project Load	
5	Detailed One-Line Diagram(s) for project	
6	Energization Date for Project Interconnection Facilities	
7	First parallel Operation Date for Testing	
8	Project Commercial Operation Date	
9	Estimated project Cost	

The following information on these system components shall appear on the preliminary One-Line Diagram, including manufacturer make and model for the items listed below:

- Breakers – Rating, location and normal operating status (open or closed)
- Buses – Operating voltage
- Capacitors – Size of bank in kVAR
- Current Transformers – Overall ratio, connected ratio
- Fuses – normal operating status, rating (Amps), type
- Generators – Capacity rating (kVA), location, type, method of grounding
- Grounding Resistors - Size (ohms), current (Amps)
- Isolating transformers – Capacity rating (kVA), location impedance, voltage ratings, primary and secondary connections and method of grounding
- Potential Transformers – Ratio, connection
- Reactors – Ohms/phase
- Relays – Types, quantity, IEEE device number, operator lines indicating the device initiated by the relays.
- Switches – Location and normal operating status (open or closed), type, rating
- Tagging Point – Location, identification

**INVERTER-TYPE GENERATORS – AGGREGATE < 30 kW**

**INTERCONNECTION APPLICATION DATA FOR:** \_\_\_\_\_

**PROVIDED BY:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

Instructions: Attach data sheets as required. Indicate in the table below the page number of the attached data (manufacturer's data where appropriate) on which the requested information is provided. Provide one table for each unique generator.

**Electric Generator(s) at the Project:** \_\_\_\_\_ **Generator No** \_\_\_\_\_

<b>Item No</b>	<b>Data Description</b>	<b>Attached Page No</b>
1	Generator type (inverter)	
2	Generator Nameplate Voltage	
3	Generator Nameplate Watts or Volt-Amperes	
4	Generator Nameplate power Factor (pf)	
5	Short Circuit Current contribution from generator at the Point of Common Coupling single-phase and three-phase)	
6	National Recognized Testing laboratory Certification	
7	Written Commissioning Test Procedure	

**APPENDIX D**

**INTERCONNECTION STUDY AGREEMENT**

Holland Board of Public Works

[Project]

Interconnection Study Agreement for

Generator Interconnection

With Aggregate Project Output Below 30 kW

WHEREAS, proposals to construct or upgrade a project which will be operated in parallel with and interconnected with [Utility's] ("Utility") electric system must be reviewed by the Utility to determine how it will impact the Utility electric system.

WHEREAS, on \_\_\_\_\_, Utility received from \_\_\_\_\_ ("Project Developer") a Generator Interconnection Application.

WHEREAS, Utility has determined that an Interconnection Study is necessary to determine whether the Utility electric system can accommodate the requested interconnection.

NOW, THEREFORE, in consideration of the mutual covenants and agreements herein set forth, the Utility and the Project Developer agree as follows:

1. The Utility shall complete an Interconnection Study in accordance with the Utility Generator Interconnection Requirements and this Agreement.
2. The Utility will charge the project Developer for an Interconnection Study. The charges shall not exceed the lesser of either of the following:
  - a. 5% of the estimated total cost of the Project or,
  - b. \$10,000

The Utility shall not charge the Project Developer if the Project's aggregate export capacity is less than 15% of the line section peak load and the Project does not contribute more than 25% of the maximum short circuit current at the point of interconnection. The Project Developer will be billed for the cost of the Interconnection Study at the conclusion of the Interconnection Study.

3. The project Developer is to return this executed Interconnection Study Agreement to the Utility as soon as possible. The interconnection process will not proceed until the fully executed Interconnection Study Agreement is received.
4. The Utility shall supply a copy of the completed Interconnection Study to the Project Developer.
5. Any notice or request made to or by either Party regarding this Agreement shall be made to the representative of the other Party, or its designated agent, as indicated below.

Utility

Project Developer

Name

Company

Address 1

Address 2

IN WITNESS WHEREOF, the Parties have caused this Interconnection Study Agreement to be executed by their respective authorized officials.

\_\_\_\_\_  
By:

\_\_\_\_\_  
By:

\_\_\_\_\_  
(Typewritten or Printed Name)

\_\_\_\_\_  
(Typewritten or Printed Name)

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date

**GENERATOR INTERCONNECTION & OPERATING AGREEMENT FOR PROJECTS WITH  
AGGREGATE GENERATOR OUTPUT LESS THAN 30 kW**

PART I

Project Developer Name: \_\_\_\_\_

Project Service Address: \_\_\_\_\_

Account #: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_

Zip Code: \_\_\_\_\_

Project Developer Contact Name: \_\_\_\_\_

Telephone: ( ) \_\_\_\_\_ Fax: ( ) \_\_\_\_\_

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

Equipment Specifications: Make: \_\_\_\_\_ Model: \_\_\_\_\_

Service Type: Single Phase / Three Phase (circle one) Voltage Level: \_\_\_\_\_

This section is to be completed by a Holland Board of Public Works representative.

Work Order Number: \_\_\_\_\_

Good Faith Estimate for Interconnection: \$ \_\_\_\_\_

Part II, Terms and Conditions are a part of this Agreement.

PROJECT DEVELOPER ACKNOWLEDGES HAVING READ TERMS AND CONDITIONS

**PROJECT DEVELOPER**

**CITY OF HOLLAND, acting by and through its  
Holland Board of Public Works**

By: \_\_\_\_\_  
(Signature)

By: \_\_\_\_\_  
(Signature)

Printed Name: \_\_\_\_\_

Printed Name: \_\_\_\_\_

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

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

Effective Date: \_\_\_\_\_

PART II  
TERMS AND CONDITIONS

This GENERATOR INTERCONNECTON & OPERATING AGREEMENT (hereinafter, this Agreement), is made and entered into as of the Effective Date identified in Part I, between the CITY OF HOLLAND, acting by and through its Holland Board of Public Works, a Michigan Municipal corporation, 625 Hastings Avenue, Holland, Michigan 49423, herein termed "HBPW", and the Project Developer, a \_\_\_\_\_ (entity status) located at \_\_\_\_\_, herein termed "Project Developer." HBPW and Project Developer are hereinafter sometimes referred to individually as "Party" and collectively as "Parties" where appropriate.

1. **Request for Service:** The Project Developer hereby requests to interconnect and operate in parallel a generation plant with aggregate generation of less than 30 kW ("Project"), as indicated in Part I, to HBPW' distribution system. In order to provide said interconnection, it may be necessary for HBPW to install certain Interconnection Facilities of which the general location and type of facilities are depicted in Exhibit 1 - Interconnection Diagram. Exhibit 1 shall also define the design and physical construction of all the Interconnection Facilities of which the Project Developer shall solely bear the costs. The Parties desire to enter into this Agreement for purposes, among others, of describing the Interconnection Facilities and associated appurtenances to interconnect the Project to HBPW' distribution system. This Agreement does not address the sale of electricity to or from HBPW.
  
2. **Deposit Requirements:** Prior to construction, Project Developer shall pay 50% of the good faith estimate, indicated in Part I. If during construction, HBPW determines that the cost of the Interconnection Facilities varies significantly from the original good faith estimate, HBPW will notify the Project Developer in writing. HBPW shall have the right to delay or suspend all construction of its Interconnection Facilities until Project Developer responds to the notice. If the Project Developer's response and acceptance of this new cost estimate is not received within **5 business days**, HBPW may terminate this Agreement by written notice to the Project Developer. Upon such termination, HBPW will refund, without interest, the Project Developer's payment, less any expenses incurred to provide interconnection service to the location described in Part I of this Agreement.

3. **Payment Schedule:**

Payment	Amount Due	Milestone Description	Target Due Date (Number of Weeks from Completion of Application)
1	50% or \$ figure	Execution of Generator Interconnection & Operating Agreement	0
2	50% or \$ figure	Construction Complete	2
	\$ _____	Good Faith Estimate Total	
	True-up (invoice or refund)	Three weeks after Construction Complete	5

All payments shall be made payable to HBPW and shall be sent to Holland Board of Public Works, Attention: Account Receivable, 625 Hastings Avenue, Holland, MI 49423. When HBPW has determined that all costs and expenses are accounted for on its books, HBPW will reconcile the good faith estimate with the final work order estimate of the interconnection and issue a final invoice or credit. Any payment not made on or before the due date shall bear interest, from the date due until the date upon which payment is made at a rate of two percent

(2%) a month, twenty-four percent a year (24%) of the amount in arrears. This interest due will be assessed when the next month's bill is issued. Any amount which is unpaid by the Project Developer shall be subject to the filing of a lien against the property to which the interconnection has been made and shall be subject to all rights granted to a lien for electrical services under the Charter of the City of Holland and applicable statutes.

4. **Site Preparation/Access:** At its own expense, the Project Developer shall make the proposed Project site available to HBPW. Said site shall be free from hazard and shall be adequate for the operation and construction of the Interconnection Facilities necessary to connect the proposed Project. HBPW, its agents and employees, shall have full right and authority of ingress and egress at all reasonable times on and across the premises of the Project for the purpose of installing, operating, maintaining, inspecting, replacing, repairing, and removing its Interconnection Facilities located on the premises. The right of ingress and egress, however, shall not unreasonably interfere with Project Developer's use of its premises.
5. **Easements/Permits:** If necessary, prior to the installation of the Interconnection Facilities and anytime thereafter, HBPW will acquire required permits and necessary easements for its Interconnection Facilities. These easements / permits may include, but shall not be limited to, easements to clear trees, and necessary rights-of-way for installation and maintenance of its Interconnection Facilities. The Project Developer shall reimburse HBPW for its costs and expenses for acquiring such easements / permits.
6. **Parallel Operation:** It is understood that the Project will normally remain connected to and be operated in parallel with HBPW's distribution system. The Project Developer shall, at its expense, install and properly maintain protective equipment and devices and provide sufficiently trained personnel to protect its equipment and service, and the equipment and service of HBPW from damage, injury or interruptions during the Project's parallel operation with HBPW' distribution system, and, without limiting the indemnity provided in Section 12, will assume any loss, liability or damage to the Project caused by lack of or failure of such protection. Such protective equipment specifications and design shall be consistent with the HBPW Utility Generator Interconnection Requirements and any successor and/or supplemental documents, incorporated herein by reference. Prior to the Project operating in parallel with HBPW's distribution system, the Project Developer shall provide satisfactory evidence to HBPW that it has met the **HBPW Customer Owned Generation Interconnect Policy, a copy of which is attached as Exhibit 2**. These HBPW Utility Generator Interconnection Requirements include, but are not limited to, approval from the local building code inspector.
7. **Testing:** The Project Developer shall perform operational testing and inspection of the Project at least 5 days before interconnection. The Project Developer shall contact HBPW and arrange for a mutually agreeable time for performing said tests. HBPW may send qualified personnel to the Project site to inspect the Project and observe the testing. Project Developer shall provide HBPW a written test report when such testing and inspection is completed and prior to interconnection. Protective relay equipment shall be tested every two (2) years (unless an extension is agreed to by HBPW) to verify the calibration indicated on the latest relay setting document issued by HBPW. Tests shall be conducted or witnessed by HBPW at Project Developer's expense. The results of such tests shall be provided to HBPW in writing for review and approval. HBPW may, at any time and at HBPW' expense, inspect and test the Project to verify that the required protective interconnection equipment is in service, properly maintained, and calibrated to provide the intended protection. If necessary, this inspection may also include a review of Project Developer's pertinent records. Inspection, testing and / or approval by HBPW or the omission of any inspection, testing and/or approval by HBPW pursuant to this Agreement shall not relieve the Project Developer of any obligations or responsibility assumed under this Agreement.

8. **Obligation to Connect:** HBPW shall not be obligated to continue the interconnection to the Project if any one or more of the following conditions exist, including but not limited to: (a) those conditions listed in the **HBPW Customer Owned Generation Interconnect Policy (Exhibit 2)** (b) the electrical characteristics of the Project are not compatible with the electrical characteristics of HBPW' distribution system, (c) the Project Developer is deficient in following either the voltage schedule or reactive power schedule established by HBPW, (d) an emergency condition exists on HBPW' distribution system, (e) Project Developer's protective relay equipment fails, resulting in a lack of the level of protection required by prudent utility practice, (f) the Project Developer's Project is determined to be disrupting HBPW customers or (g) HBPW requires disconnecting the Project in order to construct, install, maintain, repair, replace, remove, investigate, inspect or test any part of HBPW' Interconnection Facilities or any other HBPW equipment associated with the interconnection (also if a required component (example: phone line) or required modification to allow interconnection fails or becomes incapacitated and is not repaired in a timely manner). HBPW shall electrically connect or reconnect its distribution system to the Project when, in HBPW' sole opinion, the conditions named above cease to exist. Under any of the conditions listed above, HBPW will follow the agreed upon procedures for disconnecting and re-connecting the interconnection as outlined in **Exhibit 2 (HBPW Customer Owned Interconnect Policy)**.
9. **Subcontractors:** Either Party may hire a subcontractor to perform its obligations under this Agreement. However, each Party shall require its subcontractors to abide by the terms of this Agreement. Each Party shall remain primarily liable to the other Party for the performance of such subcontractor. Hiring a subcontractor does not release either Party from any of its obligations.
10. **Force Majeure:** Neither Party shall be considered to be in Default with respect to any obligation hereunder other than the obligation to pay money when due, if prevented from fulfilling such obligation by Force Majeure. A Party unable to fulfill any obligation hereunder (other than an obligation to pay money when due) by reason of Force Majeure shall give notice and the full particulars of such Force Majeure to the other Party in writing or by telephone as soon as reasonably possible after the occurrence of the cause relied upon. Telephone notices given pursuant to this article shall be confirmed in writing as soon as reasonably possible and shall specifically state full particulars of the Force Majeure, the time and date when the Force Majeure occurred and when the Force Majeure is reasonably expected to cease. The Party affected shall exercise due diligence to remove such disability with reasonable dispatch, but shall not be required to accede or agree to any provision not satisfactory to it in order to settle and terminate a strike or other labor disturbance.
11. **Assignment:** This Agreement shall not be assigned by the Project Developer except with the previous written consent of HBPW and any attempted assignment without such consent shall be void.
12. **Indemnity:** Each Party shall at all times assume all liability for, and shall indemnify and save the other Party harmless from, any and all damages, losses, claims, demands, suits, recoveries, costs, legal fees, and expenses for injury to or death of any person or persons whomsoever occurring on its own system, or for any loss, destruction of or damage to any property of third persons, firms, corporations or other entities occurring on its own system, including environmental harm or damage arising out of or resulting from, either directly or indirectly, its own Interconnection Facilities, or arising out of or resulting from, either directly or indirectly, any electric energy furnished to it hereunder after such energy has been delivered to it by such other Party, unless caused by the sole negligence or intentional wrongdoing of the other Party. The provisions of this Section 12 shall survive termination or expiration of this Agreement.

13. **Insurance:** Project Developer shall obtain and continuously maintain throughout the term of this Agreement liability insurance covering bodily injury and property damage liability with a per occurrence and annual policy aggregate amount of at least:

<u>Project Capacity</u>	<u>Minimum Limit</u>
Less than 30 kW	\$500,000

The Certificate of Insurance shall name the City of Holland, the Holland Board of Public Works, its officers and employees, as additional insureds.

When requested in writing by HBPW, said limit shall be increased each year that this Agreement is in force to a limit no greater than the amount arrived at by increasing the original limit by the same percentage change as the Consumer Price Index - All Urban Workers (CPI-U.S. Cities Average). Such policy shall include, but not be limited to, contractual liability for indemnification assumed by Project Developer under this Agreement.

Evidence of insurance coverage on a certificate of insurance shall be provided to HBPW upon execution of this Agreement and thereafter within ten (10) days after expiration of coverage; however, if evidence of insurance is not received by the 11th day, HBPW has the right, but not the duty, to purchase the insurance coverage required under this Section and to charge the annual premium to Project Developer. HBPW shall receive thirty (30) days advance written notice if the policy is cancelled or substantial changes are made that affect the additional insured. At HBPW' request, Project Developer shall provide a copy of the policy to HBPW. All certificates and notices shall be mailed to:  
Holland Board of Public Works. 625 Hastings Avenue, Holland, MI 49423 Attention: Corporate Insurance Department

14. **Limitation on Liability:** NEITHER PARTY SHALL IN ANY EVENT BE LIABLE TO THE OTHER FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES SUCH AS, BUT NOT LIMITED TO, LOST PROFITS, REVENUE OR GOOD WILL, INTEREST, LOSS BY REASON OF SHUTDOWN OR NON-OPERATION OF EQUIPMENT OR MACHINERY, INCREASED EXPENSE OF OPERATION OF EQUIPMENT OR MACHINERY, COST OF PURCHASED OR REPLACEMENT POWER OR SERVICES OR CLAIMS BY CUSTOMERS, WHETHER SUCH LOSS IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, STRICT LIABILITY OR OTHERWISE, EVEN IF IT HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.
15. **Governing Law:** This Agreement shall be deemed to be a Michigan contract and shall be construed in accordance with and governed by the laws of Michigan, exclusive of its conflict of laws principles. In the event that any change in law or administrative rule or regulation that would materially alter the terms and conditions of this Agreement, either Party shall have the right to seek modification of this Agreement without prior written consent of the other Party.
16. **Effective Date, Term, and Termination:** The Effective Date of this Agreement shall be the date of execution, as identified in Part I, and shall continue in effect until this Agreement is terminated as provided herein. The Agreement may be terminated at any time by mutual agreement of both Parties, or by either Party upon giving the other at least ninety (90) days written notice if one or more of the conditions exist as outlined in Section 8, Obligation to Connect.
17. **Retirement:** Upon termination of this Agreement pursuant to Section 16 or at such time after any of the Interconnection Facilities described herein are no longer required, then the need for the retirement of said Interconnection Facilities shall be mutually determined by the Parties. Retirement of said Interconnection Facilities may include without limitation (i) dismantling,

demolition, and removal of equipment, facilities, and structures, (ii) security, (iii) maintenance and (iv) disposing of debris. The cost of such removal shall be borne by the Party owning such Interconnection Facilities.

**18. Breach and Default:** A breach of this Agreement ("Breach") shall occur upon the failure of a Party to perform or observe any material term or condition of this Agreement. A default of this Agreement ("Default") shall occur upon the failure of a Party in Breach of this Agreement to cure such Breach. Examples of Default include, but are not limited to:

- i) Failure to pay money when due;
- ii) Failure to comply with any material term or condition of this Agreement, including but not limited to any material Breach of a representation, warranty or covenant made in this Agreement;
- iii) A Party: (i) becomes insolvent; (b) files a voluntary petition in bankruptcy under any provision of any federal or state bankruptcy law or shall consent to the filing of any bankruptcy or reorganization petition against it under any similar law; (c) makes a general assignment for the benefit of its creditors or (d) consents to the appointment of a receiver, trustee, or liquidator;
- iv) Assignment of this Agreement in a manner inconsistent with the terms of this Agreement;
- v) Failure of either Party to provide such access rights, or a Party's attempt to revoke or terminate such access rights, as provided under this Agreement;
- vi) Failure of either Party to provide information or data to the other Party as required under this Agreement, provided the Party entitled to the information or data under this Agreement requires such information or data to satisfy its obligations under this Agreement.

In the event of a Breach or Default by either Party, the Parties shall continue to operate and maintain, as applicable, its Interconnection Facilities, including but not limited to: protection and Metering Equipment, transformers, communication equipment, building facilities, software, documentation, structural components and other facilities and appurtenances that are reasonably necessary for HBPW to operate and maintain its distribution system and for the Project Developer to operate and maintain its Project in a safe and reliable manner. Upon a Default, the non-defaulting Party shall give written notice of such Default to the defaulting Party. The defaulting Party then has 30 days to cure the Default. If a Default is not cured within the period provided for herein or as agreed to by the Parties, the non-defaulting Party shall have the right to terminate this Agreement by written notice and shall be relieved of any further obligations hereunder. Further, in the event of such termination, the non-defaulting Party shall be entitled to recover from the defaulting Party all amounts due hereunder, plus all other damages and remedies to which it is entitled at law or in equity. The provisions of this Section 18 will survive termination of this Agreement.

**19. . No Partnership:** This Agreement shall not be interpreted or construed to create an association, joint venture, agency relationship, or partnership between the Parties or to impose any partnership obligation or partnership liability upon either Party. Neither Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party.

**20. Severability:** If any provision or portion of this Agreement shall for any reason be held or adjudged to be invalid or illegal or unenforceable by any court of competent jurisdiction or other governmental authority, (1) such portion or provision shall be deemed separate and independent, (2) the Parties shall negotiate in good faith to restore insofar as practicable the benefits to each Party that were affected by such ruling, and (3) the remainder of this Agreement shall remain in full force and effect.

**21. Entire Agreement:** This Agreement and the HBPW Utility Generator Interconnection Requirements shall constitute the entire understanding between the Parties with respect to the subject matter hereof, supersede any and all previous understandings between the Parties with respect to the subject matter hereof, and binds and insures to the benefit of the Parties, their successors, and permitted assigns. No amendments or changes to this Agreement shall be binding unless made in writing and duly executed by both Parties.

22. **No Third Party Beneficiaries:** This Contract is intended for the benefit of the parties hereto and does not grant any rights to any third parties unless otherwise specifically stated herein.

23. **Notices:** All notices required hereunder shall be in writing and shall be sent by United States mail or delivered in person to the Parties at their respective addresses as set forth in Part I. Either Party may at any time change the addressee or address to which notices to it are to be mailed or delivered by giving notice of such change to the other Party. All Notices shall become effective upon date of receipt.

24. **Project Requirements/HBPW Web Site.** The Project Developer acknowledges that the HBPW has posted on its designated web site terms and conditions relating to the net metering program, including but not limited to enrollment, metering requirements, billing, eligibility, net excess generation credits, program availability, and program termination. The Project Developer agrees that such terms and conditions are incorporated by reference under this Agreement as presently existing and as from time to time amended by the HBPW. Any amendment or modification as shown on the website relating to the above-captioned matters (including such other matters as may be addressed by the HBPW) shall be incorporated into this Agreement.

25. **Other.**

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EXHIBIT 1  
INTERCONNECTION DIAGRAM

(Insert a One-Line Diagram (PDF file) for the size and type of generator that will be installed)

## BPW POLICY MANUAL

ETD – 014

### Customer Owned Generation Interconnect Policy

Page 1 of 2

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EFFECTIVE DATE  
23 July 2007

REVISION DATE  
15 Sept 2008

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#### Intent

It is the intent of the Holland Board of Public Works (HBPW) to allow the electrical interconnection of cogeneration facilities and small power production facilities to the HBPW distribution system in accordance with the provisions of this article.

#### Guidelines

##### 1. Holland Board of Public Works

- a. Will ensure the interconnection is in compliance with Public Utility Regulatory Policies Act (PURPA) and Federal Energy Regulatory Commission (FERC) rules and regulations.
- b. Will inform potential power producers that they have the responsibility to comply with all federal, state, and local regulations.
- c. Will, upon completion of a satisfactory Interconnect Study, provide interconnection service to any electric consumer installing a 30 KW or greater generation unit. Service is evaluated and provided on a case-by-case basis and will require a separate Power Purchase Agreement.
- d. Will, upon completion of a satisfactory Interconnect Study, provide interconnection service to any electric consumer installing less than or equal to a 30 KW generating unit in which the primary energy source must be solar, biomass, waste, wind, geothermal, or approved renewable energy sources.
- e. Will own the meters utilized for billing.

##### 2. The Customer

- a. Shall install and own conductors and equipment up to the service point as specified in the HBPW "Distribution Line Extension" policy.
- b. The Interconnect Study will be conducted at the customer's expense.
- c. Shall make application to the BPW for the proposed installation, obtain approval of the location, equipment, and design before starting installation of the installation, and pay any HBPW construction fees for system improvements as specified in the HBPW "Distribution Line Extension" policy.

- c. Shall submit a plan view drawing of the installation and shop drawings of switchgear to the BPW for approval prior to finalizing orders for service equipment to avoid delays and unnecessary expense to the customer and the HBPW.
- d. The interconnection and parallel operation of generation equipment shall be in conformance with prudent utility practices, shall maintain the integrity of the HBPW distribution system, and ensure no adverse impacts upon the quality of service to other HBPW customers.
- e. Protection, safety, and interconnect equipment must meet standards of accepted good design, engineering, electric safety practices, and all applicable local, state, and federal electrical installation and safety codes.
- f. A suitable disconnect, interconnection breaker, and interconnect relay shall be installed to automatically disconnect and isolate the generation facility from the HBPW distribution system in the event of a service interruption. The automatic disconnect equipment shall receive its voltage and frequency reference from the HBPW service lines. Such equipment must be capable of preventing the generation facility from energizing the HBPW service lines during a service interruption.
- g. Electrical parameters such as fault protection, voltage levels, synchronization, grounding, harmonics, power factor, voltage regulation, flicker, and frequency regulation shall comply with the latest edition of The Institute of Electrical and Electronic Engineers “Standard for Interconnecting Distributed Resources with Electric Power Systems” (IEEE standard 1547)
- h. Any exceptions to the above requirements must be specifically approved by HBPW.

## **Appendix F**

### HBPW Contacts

<b>Bill Bush</b>	Superintendent of Electric Transmission & Distribution	<b>355-1611</b>
<b>Mike Buikema</b>	Electrical Engineering Supervisor	<b>355-1614</b>
<b>Karen Bastien</b>	Utility Engineering Aide	<b>355-1599</b>
<b>Rob Kerbyson</b>	Engineering Technician II	<b>355-1635</b>