### Electric Utility Contact Information

<table>
<thead>
<tr>
<th>Indiana Michigan Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interconnection Coordinator - Shari Konger</td>
</tr>
<tr>
<td>1 Riverside Plaza</td>
</tr>
<tr>
<td>Columbus OH 43215-2373</td>
</tr>
<tr>
<td>Interconnection Hotline: 614-716-4020</td>
</tr>
<tr>
<td>Interconnection Email: <a href="mailto:dgcoordinator@aep.com">dgcoordinator@aep.com</a></td>
</tr>
</tbody>
</table>

### Required Information for all Projects Types

#### Electric Utility Customer Information: (As shown on utility bill)

- Customer Name (Last, First, Middle):
- Customer Mailing Address:
- Customer Phone Number:
- Customer E-Mail Address: (optional)

#### Project Developer/Single Point of Contact

- Name:
- Address:
- Phone Number:
- Fax Number:
- E-Mail Address:
- Project Site Address:

#### Generation System Information

- Project Type (Base load, peaking, intermediate)
- Energization Date for Project Interconnection Facilities
- First Parallel Operation Date for Testing
- Project Commercial Operation Date
- Estimated Project Cost
- Operation Mode
  - ___ Flow-Back
  - ___ Non-Flow-Back

#### Isolating Transformer(s) between Generator(s) and Utility

- Transformer Model Number:
- Transformer Manufacturer:
- Rated kV and connection (delta, wye, wye-gnd) of each winding
- kVA of each winding
- BIL of each winding
- Fixed taps available for each winding
- Positive/Negative range for any LTC windings
- %Z impedance on transformer self cooled rating
- Percent Excitation current at rated kV
- Load Loss Watts at full load or X/R ratio
1. Customer’s Proof of General Liability Insurance for a minimum of $1,000,000  
(Per MPSC Order in Case No. U-15787 - Customer must maintain a minimum of $1,000,00 General Liability Insurance.)

2. Attached Site Plan:

3. Attached Electrical One-Line Drawing:
(Per MPSC Order in Case No. U-15787, the one-line diagram must be signed and sealed by a licensed professional engineer, licensed in the State of Michigan)

4. Attached Electrical Three-Line Drawing:

5. Attached Specification for Equipment

6. Applicable Technical Appendix (A-C)

Note: The following information on these system components shall appear on the preliminary Detail One-Line. See Sample One-Line diagram in Appendix D-F

- Breakers - Rating, location and normal operating status (open or closed)
- Buses - Operating voltage
- Capacitors - Size of bank in kVAR
- Circuit Switchers - Rating, location and normal operating status (open or closed)
- 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

Customer and Contractor Signature and Fees

0 Attached $500 Interconnection Application Fee  
(Check # / Money Order # )

( Sign and Return complete Application with Application Fee to Electric Utility Contact )

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

__________________________________________________________
Customer Signature

__________________________________________________________
Contractor Signature (if applicable)
### Generator Information

| a. Generator Nameplate Voltage          | a.                |
| b. Generator Nameplate Watts or Volt-Amperes | b.               |
| c. Generator Nameplate Power Factor (pf) | c.               |
| d. RPM                                 | d.               |

### Technical Information

| e. Minimum and Maximum Acceptable Terminal Voltage | e.                |
| f. Direct axis reactance (saturated)             | f.                |
| g. Direct axis reactance (unsaturated)           | g.                |
| h. Quadrature axis reactance (unsaturated)       | h.                |
| i. Direct axis transient reactance (saturated)   | i.                |
| j. Direct axis transient reactance (unsaturated) | j.                |
| k. Quadrature axis transient reactance (unsaturated) | k.                |
| l. Direct axis sub-transient reactance (saturated) | l.                |
| m. Direct axis sub-transient reactance (unsaturated) | m.                |
| n. Leakage Reactance                            | n.                |
| o. Direct axis transient open circuit time constant | o.                |
| p. Quadrature axis transient open circuit time constant | p.                |
| q. Direct axis subtransient open circuit time constant | q.                |
| r. Quadrature axis subtransient open circuit time constant | r.                |
| s. Open Circuit saturation curve                 | s.                |
| t. Reactive Capability Curve showing overexcited and underexcited limits (Reactive information if non-synchronous) | t.                |
| u. Excitation System Block Diagram with values for gains and time constants (Laplace transforms) | u.                |
| v. Short Circuit Current contribution from generator at the Point of Common Coupling | v.                |
| w. Rotating inertia of overall combination generator, prime mover, couplers and gear drives | w.                |
| x. Station Power load when generator is off-line, Watts, pf | x.                |
| y. Station Power load during start-up, Watts, pf | y.                |
| z. Station Power load during operation, Watts, pf | z.                |
## Generator Information

- a. Generator Nameplate Voltage
- b. Generator Nameplate Watts or Volt-Amperes
- c. Generator Nameplate Power Factor (pf)
- d. RPM

## Technical Information

- e. Synchronous Rotational Speed
- f. Rotation Speed at Rated Power
- g. Slip at Rated Power
- h. Minimum and Maximum Acceptable Terminal Voltage
- i. Motoring Power (kW)
- j. Neutral Grounding Resistor (if Applicable)
- k. $I_2t$ or $K$ (Heating Time Constant)
- l. Rotor Resistance
- m. Stator Resistance
- n. Stator Reactance
- o. Rotor Reactance
- p. Magnetizing Reactance
- q. Short Circuit Reactance
- r. Exciting Current
- s. Temperature Rise
- t. Frame Size
- u. Design Letter
- v. Reactive Power Required in Vars (No Load)
- w. Reactive Power Required in Vars (Full Load)
- x. Short Circuit Current contribution from generator at the Point of Common Coupling
- y. Rotating inertia, $H$ in Per Unit on kVA Base, of overall combination generator, prime mover, couplers and gear drives
- z. Station Power load when generator is off-line, Watts, pf
- aa. Station Power load during start-up, Watts, pf
- bb. Station Power load during operation, Watts, pf
## Inverter Generators

### Generator Information

- a. Generator Nameplate Voltage
- b. Generator Nameplate Watts or Volt-Amperes
- c. Generator Nameplate Power Factor (pf)
- d. RPM

### Technical Information

- e. Generator Nameplate Voltage
- f. Generator Nameplate Watts or Volt-Amperes
- g. Generator Nameplate Power Factor (pf)
- h. Minimum and Maximum Acceptable Terminal Voltage
- i. Reactive Capability Curve showing overexcited and underexcited limits (Reactive Information if non-synchronous)
- j. Short Circuit Current contribution from generator at the Point of Common Coupling
- k. Station Power load when generator is off-line, Watts, pf
- l. Station Power load during start-up, Watts, pf
- m. Station Power load during operation, Watts, pf
One-Line Diagram

Name of the Professional Engineer ____________________________
PE License Number __________________________________________
Address ____________________________________________________
Signature ___________________________________________________
Induction Generators

One-Line Representation
Typical Isolation and Fault Protection for Induction Generator Installations

Distribution Circuit

- 3-phase circuit breaker, switch, or set of fuses
- 3 VTs (Note B)
- 2E (Note D)
- 2F

Local Load

Similar metering, relaying, and data is required for each generator.

Legend:
- 27: Undervoltage
- 32: Reverse Power (not required for collocation)
- 51N: Neutral overvoltage (required for grounded secondary)
- 50: Overvoltage
- 5N: Zone overvoltage (assuming ungrounded secondary on power transformer)
- 80: Over/Undervoltage

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 ground to the approved by Utility.
B) Protection alternatives for the various acceptable transformer connections are shown. Only one protection alternative will ultimately be used, depending on the actual transformer winding connections. VTs for 50, 27, 80, and 32 are shown connected on the primary (Project side) of the power transformer. VTs are required on the secondary (utility side) of the transformer if a 5N is required for the grounded secondary. 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 52N breaker is acceptable, depending upon whether the Project Developer wants to serve its own isolated load after loss of utility service.

One-Line Diagram

Name of the Professional Engineer______________________
PE License Number___________________________________
Address_____________________________________________
Signature_____________________________________________
GENERATOR INTERCONNECTION APPLICATION
FOR ALL PROJECTS WITH AGGREGATE GENERATOR OUTPUT OF
MORE THAN 2 MW

APPENDIX F

Inverter Generators

ONE-LINE REPRESENTATION
TYPICAL ISOLATION AND FAULT PROTECTION FOR INVERTER GENERATOR INSTALLATIONS
150 kW OR LARGER, BUT LESS THAN 750 kW

Distribution Circuit

S - phase circuit breaker, recloser, switch or set of 3 fuses

S - phase gang operated disconnect, switch (if required)

59

(1)

51N

(5)

59

(8)

(Nota D)

(Nota C)

Local Load

Transformer

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) Protection alternatives for the various acceptable transformer connections are shown. Only one protection alternative will usually be used, depending on the actual transformer winding connections. VTs for 69, 37, 81Ω and 32Ω are shown connected on the primary (Project side) of the power transformer, but may instead be connected on the secondary (Utility side). VTs are required on the secondary of the power transformer if a 59N is required for an ungrounded secondary connection. IEEE Std 1147 requirements for voltage and frequency must be met at the PCC. IEEE Std 1147 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 69Ω breakers or the 59N breaker is acceptable, depending upon whether the Project Developer wants to have its own isolated load after loss of utility service.

One - Line Diagram
Name of the Professional Engineer_________________________
PE License Number______________________________________
Address________________________________________________
Signature________________________________________________