



# BOROUGH OF TARENTUM

Allegheny County, Pennsylvania



## ORDINANCE #19-02

ORDINANCE OF THE BOROUGH OF TARENTUM, COUNTY OF ALLEGHENY, COMMONWEALTH OF PENNSYLVANIA, AMENDING THE CODE OF THE BOROUGH OF TARENTUM, CHAPTER 111, ELECTRICAL STANDARDS, REGULATING CUSTOMER OWNED ELECTRIC GENERATION INSTALLATION AND ESTABLISHING FEES AND SPECIFIC TECHNICAL REQUIREMENTS TO ACCOMMODATE CUSTOMER OWNED GENERATION OF ELECTRICITY.

**WHEREAS**, in order to protect the health, safety, and welfare of the citizens of the Borough of Tarentum, Borough Council has determined it necessary to regulate customer owned electric generation installation; and

**WHEREAS**, the Borough desires to encourage and require proper operation of customer owned generation installations; and

**WHEREAS**, the Borough desires to ensure the necessary compliance with the Borough Code; and

**WHEREAS**, the Borough desires to promulgate fees and specific technical requirements to accommodate Customer Owned Generation of Electricity.

**NOW, THEREFORE**, BE IT ORDAINED AND ENACTED by Council of the Borough of Tarentum, and it is hereby ordained and enacted by authority of same as follows:

### **ARTICLE III: CUSTOMER OWNED ELECTRIC GENERATION.**

#### **Section 1.1 – Provisions for the Establishment of Customer Owned Electric Generation**

- A. Customer generation may be installed to offset the customer energy consumption up to the annual consumption of the customer subject to the capacity limits contained herein. The installation shall comply with all applicable land use, zoning, planning, Borough Code rules and regulations and the applicable electric classification and rates.
- B. The Borough shall provide net metering if a customer generates electricity and owns, operates or leases the electric generation facility with a capacity that will not exceed 25 kW per meter for residential customers and or not larger than 500 kilowatts if installed for nonresidential customers.
- C. The system capacity shall produce no more than 110% of the customers expected aggregate electrical consumption, calculated on the average of the two previous 12-month periods of actual electrical usage at the time of installation of energy generating equipment and subject to the capacity limits specified herein. For new building construction or in instances where



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less than two previous 12-month periods of actual usage is not available, electrical consumption will be estimated at 110% of the consumption of units of similar size and characteristics at the time of installation of energy generating equipment and subject to the capacity limits herein. Net metering shall be accomplished through a single meter provided by the Borough, at the Borough's expense, that runs forward and backward in order to measure net energy flow during a billing period.

- D. If the customer generates more energy than consumed during a monthly billing cycle, the customer shall receive an energy credit in kWh for the next billing month to offset consumption in subsequent billing periods until all credits are used. During any subsequent billing period prior to the end of an annualized billing period, the crediting of excess energy kWh will result in the reduction of cost paid by the customer for the equivalent volumetric energy kWh.
- E. Monthly credit shall be applicable to energy only. Excess energy credits at the end of a 12-month period established at the discretion of the Borough, shall be credited in dollars and calculated by multiplying the excess kWh credits by the average Borough's all-in wholesale electric rate over the previous 12-month period. This average wholesale Borough electric rate shall be based the previous 12-month power supply cost to the Borough. Regardless of the in-service date of the installation, the 12-month period shall be set by the Borough. The customer shall be required to pay all applicable charges including customer, capacity, tax and any purchased power adjustment.
- F. The customer shall retain ownership of all Renewable Energy Certificates associated with electric energy produced from all eligible energy resources of the customer-generator facility and consumed by the customer.
- G. If the total generating capacity of all customer-generation using net metering systems served exceeds (5%) of the capacity necessary to meet the Borough's aggregated monthly peak demand for a particular calendar year, the Borough may elect not to provide net metering services to additional customers.
- H. Fees shall include Borough costs, including but not limited to an application fee, inspection fee, and annual inspection fee. Each fee established by this Ordinance may be amended from time to time by Resolution of the Borough. Customer shall be responsible for costs of any and all system studies and upgrades, including metering, required to accommodate generation.
- I. All customer owned generation shall be subject to the Borough of Tarentum Technical Requirements for Customer Owned Generation, which may be amended from time to time by resolution of the Borough.



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### Section 1.2 – Fees

A. For all customer owned generation, the following fees shall apply:

Application Fee:	\$300.00
Interconnection Study Fee:	At Cost
Initial Inspection Fee:	\$150.00
Annual Inspection Fee:	\$150.00

B. Customer shall be responsible for costs of all system studies and upgrades, including metering, required to accommodate generation. Customer shall be responsible for annual system testing, witnessed by representatives of the Borough.

C. The fixed annual reconciliation period shall be set as June through May.

### Section 1.3 – Definitions

A. Account. An account is one metered or un-metered rate or service classification which normally has one electric delivery point of service. Each account shall have only one electric service supplier which shall be the Borough of Tarentum, providing full electric supply requirements for that account. No other full or partial supplier including but not limited to generation output sales from onsite generation systems shall be allowed with interconnection from the Borough.

B. Company. Borough of Tarentum (Hereinafter called Borough).

C. Customer. Any adult person, partnership, association, corporation, or other entity: (i) in whose name a service account is listed, (ii) who occupies or is the ratepayer for a premise, building, structure, etc., and (iii) who is primarily responsible for payment of bills. A customer includes anyone taking electric service from the Borough under one service classification for one account, premises or site. Multiple premises or sites under the same name are considered multiple Customers.

D. Distributed Generation or On-Site Distributed Generation. An electrical generating unit which may be connected to the Borough electric system.

E. Generator Owner. The owner of the generating system that is interconnected to the Borough electric system. Customer shall not be required to own the generation system. However, no energy or capacity sale shall be allowed between the generation owner or a third party and customer. No payment from owner or third party to customer shall be allowed based on energy sale, capacity sale or other generation-based output.



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- F. Grid. The interconnected arrangement of lines and transformers that make up the Borough electric power system.
- G. IEEE Standard 929. IEEE Standard entitled Recommended Practice for Utility Interface of Photovoltaic (PV) Systems, latest approved revision thereof.
- H. IEEE Standard 1547. IEEE Standard entitled IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems, latest approved revision thereof.
- I. Interconnection. The physical connection of distributed generation to the Borough system in accordance with these requirements so that parallel operation can occur.
- J. Interconnection Application. The letter application which must be submitted by the Generation Owner to the Borough for permission to interconnect with the Borough system.
- K. Inverter. A static power converter with control, protection and filtering functions that converts Direct Current input to Alternating Current output. Inverters must be of the non-islanding type.
- L. Island. A portion of the utility system which contains both load and distributed generation and is isolated from the remainder of the utility system.
- M. Parallel Operation. Any electrical connection between the Borough system and the Generator Owner's generating source.
- N. Point of Common Coupling. The point where the electrical conductors of the Borough system are connected to the Customer's conductors and where any transfer of electric power between the Generator Owner and the Borough electric system takes place.
- O. Pre-Interconnection Study. A study or studies which may, at the discretion of the Borough, be undertaken by the Borough in response to its receipt of a completed application for parallel operation with the Borough's system. Pre-Interconnection Studies may include, but are not limited to service studies, coordination studies and facilities impact studies. Applicant shall be responsible for all study costs.
- P. Qualifying Facility (QF). An electric generation facility which is a qualifying facility under Subpart B, Section 201 of the Federal Energy Regulatory Commission's regulations per the Public Utility Regulatory Policies Act of 1978.
- Q. Stabilized. The Borough's system following a disturbance which returns to the normal range of voltage and frequency for at least 5 minutes or longer as coordinated with the Borough.



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The Borough may require a longer period upon a reasonable showing that the reconnection after 5 minutes will adversely affect the safety and reliability of the electric system.

- R. Unit. A distributed generation facility.
- S. Utility System or Electric Distribution Facility. Borough's distribution system operating to which the generation equipment is interconnected.

### **Section 1.4 – Technical Requirements for Customer Owned Generation**

- A. General. The customer must be first in compliance with all applicable land use, zoning, planning, electric ordinance rules and regulations and the applicable tariff classification and rates. The terms and conditions contained herein are in addition to, but do not modify nor negate the terms of the Borough Code.
- B. Purpose. The purpose of this document is to state the terms and conditions that govern the interconnection and operation of on-site distributed generation, in order to:
  - a. Establish technical requirements which will promote the safe and reliable parallel operation of distributed generation resources;
  - b. Enhance the reliability of electric service;
  - c. Facilitate the implementation and use of distributed resources technologies;
  - d. Enhance economic efficiency in the production and consumption of electricity and other energy; and
  - e. Promote the use of distributed resources in order to provide electric system benefits during periods of capacity constraint.
- C. Applicability. Unless otherwise provided, these requirements apply to all customer generation interconnected and operated in the Borough of Tarentum power delivery system.
- D. Interconnection Application. A proposed Generator Owner shall make a formal application to the Borough for the interconnection of a generator to the Borough system. The customer shall submit a letter to the Borough stating the technical aspects of the installation, two clean copies of equipment catalog cuts and two copies of a one line or riser diagram of the proposed installation and interconnection to the Customer and Borough system. Additionally, a representation by the customer that the installation will be constructed and operated in full compliance with the Borough requirements shall be included. For inverter installations, a statement that any single inverter and any group of inverters for the project is of the non-islanding type to prevent back feeds shall also be included.
- E. Designation of Borough Contact Persons for Matters Relating to Distributed Generation Interconnection. The Borough Electric Department will be the designated point of contact for



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all matters related to interconnected generation. The Borough Electric Department will maintain records concerning applications received for interconnection and parallel operation of distributed generation. Such records will include the date of receipt of each such application, documents generated in the course of processing such applications, correspondence regarding such applications and the final disposition of such application.

- F. Pre-Interconnection Studies. The Borough reserves the right to conduct a service study, coordination study, or facilities impact study prior to approval of a distributed generation unit. In instances where such studies are deemed necessary, the scope of such studies shall be based on the characteristics of the particular distributed generation unit to be interconnected and the proposed point of interconnection.
- G. Completion of Pre-interconnection Study. Upon completion of the interconnection study, the Borough will notify the Generator Owner that the application has been approved or indicate why the application cannot be approved.
- H. Interconnection of Distributed Generation. Where generation is capable of exporting power to Borough system, the interconnection study may result in more stringent interconnection requirements.
- I. Connection Approval. The Generator Owner can connect their generation to the Borough system only after the Interconnection Application has been approved, the installation has been inspected by the Borough designee, the system has been tested and the tests witnessed by the Borough designee, and the Generation Owner has received approval notification.
- J. Interconnected Generation Site Warning Label. The Generator Owner will install a warning label in a conspicuous place on their electric meter or meter box to notify the Borough personnel that there is a generator source installed on the load side of the meter. The warning label shall not be placed in a location that would interfere with the ability of Borough personnel to read the electric meter. The warning label must be placed before the generation can be interconnected.
- K. Disconnection and Reconnection. The Borough may disconnect a distributed generation unit under the following conditions:
  - a. Application Termination. Upon termination of the approved interconnection Application.
  - b. Non-Compliance. For non-compliance with the technical requirements specified in this document or other requirement contained in the Borough Code, provided that the Borough has given notice to the Generator Owner and provided the Generator Owner



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reasonable time (consistent with the condition) to correct such non-compliance. The Borough will reconnect the unit only upon receipt of certification from the Generator Owner and verification by the Borough that the unit is in compliance. The Borough will provide verification within a reasonable time period.

- c. In case of a system emergency outage of the Borough Electrical Sources. The Generator Owner's generation equipment must be installed and configured so that parallel operation must cease immediately and automatically during outages or loss of the Borough electric source in accordance with these requirements. The Generation Owner must also cease parallel operation upon notification by the Borough of a system emergency, abnormal condition or in cases where such operation is determined to be unsafe, interferes with the supply of service to other customers or interferes with the Borough's system maintenance or operation. In addition, the Borough may disconnect the generator from the system for without notice.
  - d. For Routine Maintenance and Repairs. The Borough may disconnect a Customer/Generation Owner for routine maintenance and repairs on the Borough system.
- L. Termination. The Generation Owner may terminate the approved Interconnection Application upon thirty (30) days written notice to the Borough. The Generator Owner must give the Borough notice that it intends to permanently shut down his generation.
- M. Privileged Communications Concerning Proposed Distributed Generation Projects. In the course of processing applications for parallel operation and in the conduct of pre-interconnection studies, the Generation Owner shall provide the Borough with detailed information concerning the proposed distributed generation project and note as privileged, on each applicable sheet and information considered privileged. If any submitted information is requested by a third party, notice shall be given by the Borough to the Generator Owner. It shall be the responsibility of the generation owner to legally challenge the release of this information.
- N. Technical Requirements for Parallel Operation of On-site Distributed Generation Units. This subsection describes minimum requirements and procedures for safe and effective connection and operation of distributed generation. A Generator Owner may operate 60 Hertz, three phase or single-phase generating equipment, in parallel with the Borough's system pursuant to an approved Interconnection application provided that the equipment and Generator Owner meet or exceed the requirements of these requirements and that the Borough has approved the Generator Owner's application to interconnect. This subsection describes typical interconnection requirements. Certain specific interconnection locations and conditions may require the installations of additional protective settings or hardware,



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especially when exporting power to the system. If the Borough, in the Borough's sole opinion, concludes that an application for parallel operation requires additional customer protection, settings or hardware, the Borough shall make those requirements known after all pertinent studies are completed.

Approval to connect to the Borough system indicates only that the minimum Borough electrical requirements for a safe proper interconnection have been satisfied. Such approval does not imply that the Generator Owner's facility meets all land use, zoning, planning or federal, state and local standards or regulations.

a. General Interconnection and Protection Requirements.

1. The Generator Owner's generation and interconnection installation must meet all Borough land use, zoning, planning and applicable national, state, and local construction and safety codes.
2. The Generator Owner's generator shall be equipped with protective hardware and software designed to prevent the generator from energizing the Borough's de-energized circuits. The Generator must automatically disconnect from the Borough's system if the Grid source is lost, irrespectively of connected loads or other generators.
3. The generator shall be equipped with the necessary protective hardware and software designed to prevent sustained parallel operation of the generating equipment with the Borough system unless the system service voltage and frequency are within acceptable magnitudes to the Borough.
4. The Generator Owner will be responsible for protecting its own generating and interconnection equipment in such a manner so that Borough system outages, short circuits, single phasing conditions or other disturbances including zero sequence currents and ferroresonant over-voltages do not damage the Generator Owner's generating equipment. The protective equipment shall also prevent excessive or unnecessary tripping that would adversely affect the Borough's service reliability to other Generator Owners and Customers.
5. The generator and interface protection schemes shall be continuously monitored and functioning and the generator shall immediately disconnect from the Borough's system for any condition that would make the protection scheme inoperable.





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6. The operating power required for the protection and control schemes for the generator and the control power used to disconnect the generator from the Borough must not be dependent on local Borough power.
7. Where multiple generators are connected to the system through a single point of common coupling, the sum of the ratings of the generators will be used to determine the applicability of these requirements. Protection scheme performance with one or more units off line will be considered.
8. Applicable circuit breakers or other interrupting devices at the Generator Owner's facility must be capable of interrupting the maximum available fault current at the site, including any contribution from the Owner's generator(s).
9. The Generator Owner will furnish and install a manual disconnect device which, when opened, will have the effect of isolating the generator from the Borough's system. The disconnect device shall have a visual break disconnect switch and shall be mounted on the exterior of the building adjacent to the Borough meter accessible to the Borough's personnel at all times, and shall be capable of being locked in the open position via a Borough padlock. The Borough shall use reasonable efforts to utilize padlocks of a size consistent with typical manufacture's specifications. The Generator Owner shall follow the Borough's switching, clearance and tagging procedures.
10. The design, procurement, installation, and maintenance of the equipment at the Generator Owner's site is the responsibility of the Generator Owner and at the Generator Owner's expense.
11. Any necessary enhancements or improvements needed within the Borough's system and/or at the Customer sites to accommodate the parallel interconnection of the Generator Owner's generation will be at the Generator Owner's expense.
12. The Generator Owner has full responsibility and liability for the safe and proper operation of their equipment and the power originating from their generator. The Generator Owner is also responsible for synchronizing their generator(s) with the Borough's system and maintaining a synchronous condition.
13. The Generator Owner must immediately cease parallel operation upon notification by the Borough if such operation is determined to be unsafe,



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interferes with the supply of service to other customers, or interferes with the Borough's system maintenance or operation.

14. The Borough reserves the right to specify the type of transformer connection that will be employed for all multiphase interface transformers.

b. Prevention of Generator Owner Generation Interference with the Borough System. To eliminate undesirable interference caused by operation of the Generator Owner's generating equipment, the Generator Owner's generator shall meet the following criteria:

1. Voltage. The generating equipment will be operated in such a manner that the voltage levels on the Borough's system are in the same range as if the generating equipment were not connected to the Borough's system. The Generator Owner shall provide an automatic method of initiating a disconnect sequence of his generating equipment from the Borough system with set points noted in the table below.

<b>Generating Systems with Inverters Up to 25kw</b>	<b>Generating Systems with Inverters Greater than 25kw</b>	<b>Non-Inverter or Rotating Machine Generating Systems</b>
<ul style="list-style-type: none"> <li>▪ Trip in 0.16 second for <math>V &lt; 50\%</math></li> <li>▪ Trip in 2 second for <math>50\% \leq V &lt; 88\%</math></li> <li>▪ Trip in 2 seconds for <math>110\% \leq V &lt; 120\%</math></li> <li>▪ Trip in 0.16 second for <math>120\% \leq V</math></li> </ul>	<ul style="list-style-type: none"> <li>▪ Trip in 0.16 second for <math>V &lt; 50\%</math></li> <li>▪ Trip in 0.1 to 30 seconds for <math>50\% \leq V &lt; 88\%</math></li> <li>▪ Trip in 0.1 to 30 seconds for <math>110\% \leq V &lt; 120\%</math></li> <li>▪ Trip in 0.16 second for <math>120\% \leq V</math></li> </ul> <p>(Specific voltage and time delay set points will be determined for each installation.)</p>	<ul style="list-style-type: none"> <li>▪ Trip in 0.16 second for <math>V &lt; 50\%</math></li> <li>▪ Trip within 2 seconds for <math>50\% \leq V &lt; 88\%</math></li> <li>▪ Trip in 1 second for <math>110\% \leq V &lt; 120\%</math></li> <li>▪ Trip in 0.16 second for <math>120\% \leq V</math></li> </ul> <p>(Specific voltage and time delay set points will be determined for each installation.)</p>

Note: Trip time refers to the time between when the abnormal voltage condition occurs and the generator being disconnected from the Borough system.



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On three phase generator installations, full three phase voltage sensing shall be employed. Voltages must be sensed on the high side of any interface transformer if the transformer high voltage winding is ungrounded.

The Generator Owner may reconnect to the grid when the system voltage returns to normal range and is stabilized as defined in Section 1.3 – Definitions.

2. Flicker. The Generator equipment or operation of equipment shall not cause voltage flicker on the Borough's system or to any other Borough customer. This flicker shall not exceed the “Borderline of Irritation” curve, as defined in IEEE Std 519-1992, Recommended Practices and Requirements for Harmonic Control in Electric Power Systems. Lower levels of flicker may be required in areas where equipment such as computers and instrumentation are impacted.
3. Frequency. The operating frequency of the generating equipment shall not deviate more than the values noted in the table below.

<b>Generating Systems with Inverters Up to 25kw</b>	<b>Generating Systems with Inverters Greater than 25kw</b>	<b>Non-Inverter or Rotating Machine Generating Systems</b>
<ul style="list-style-type: none"> <li>▪ Trip in 0.16 second for <math>F &lt; 59.3</math> Hz</li> <li>▪ Trip in 0.16 second for <math>F &gt; 60.5</math> Hz</li> </ul>	<ul style="list-style-type: none"> <li>▪ Trip in 0.16 second for <math>F &lt; 57.0</math> Hz</li> <li>▪ Trip in 0.16-300 seconds for <math>57.5 \leq F &lt; 59.8.5</math> Hz (Other frequency and time delay set points may be specified for a specific installation.)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Trip in 0.16 second for <math>F &lt; 57.0</math> Hz</li> <li>▪ Trip in 0.16-300 seconds for <math>57.5 \leq F &lt; 59.8.5</math> Hz (Other frequency and time delay set points may be specified for a specific installation.)</li> </ul>

Note: Trip time refers to the time between when the abnormal frequency condition occurs and the generator being disconnected from Borough.

The Generator Owner may reconnect when the system frequency returns to normal range and is stabilized as defined in Section 1.3 – Definitions.

4. Harmonics. Non-linear circuit elements such as inverter can produce harmonics. Per IEEE std 519, Recommended Practices and Requirements for Harmonic Control in Electric Power Systems, the total harmonic distortion



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(THD) voltage shall not exceed 5% of the fundamental 60 Hz frequency nor 3% of the fundamental for any individual harmonic as measured at the location where the customer interfaces with the Borough's system (Point of Common Coupling). In addition, the level of harmonic current that the customer is allowed to inject into the Borough's system shall not exceed that specified in IEEE Std 519. Furthermore, any communication notch shall be limited as defined by IEEE Std 519. The preceding requirements apply to all types of generation systems.

The Generator Owner is responsible for the installation of any necessary controls or hardware to limit the voltage and current harmonics generated by his equipment to defined levels.

- 5. Power Factor. The generator must not adversely impact the power factor of the Generator Owner site. Inverters shall be designed to operate close to unity power factor. The operating power factor of the generator shall be contained within the limits defined in the table below.

<b>Generating Systems with Inverters Up to 25kw</b>	<b>Generating Systems with Inverters Greater than 25kw</b>	<b>Non-Inverter or Rotating Machine Generating Systems</b>
▪ 0.985 Lagging or leading when output exceeds 10% of inverter rating.	▪ 0.985 Lagging or leading when output exceeds 10% of inverter rating.	▪ 0.985 Lagging or leading

However, to the extent that a Generator Owner's power factor at the Point of Common Coupling falls below 0.985 lagging, the Generator Owner must obtain, install and maintain, at his expense, corrective apparatus that compensates for the drop in power factor caused by the installation of the generator.

- 6. Current. In some cases, directional over-current protection may be required to limit fault current flowing onto the Grid in the event of a line fault. DC inverters that are incapable of producing fault current do not require directional over-current protection.

Inverter systems shall not inject DC current greater than 0.5% of rated inverter output in the AC interface point under either normal or abnormal conditions.



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- 7. Fault and Line Clearing. The Generator Owner shall automatically disconnect from the Borough's system during electrical faults on the Borough's electrical system and upon loss, of the Borough's electric source. The Generator Owner may reconnect when the system voltage and frequency return to normal range and is stabilized as defined in Section 1.3 – Definitions. Detection of the loss of the Borough's primary electric system, where the Generator Owner is operating in an island with other customer load, becomes increasingly difficult as the level of dispersed generation on a feeder approaches the connected load. The over/under voltage and over/under frequency settings described previously along with the anti-islanding provisions of IEEE 929/UL 1746 inverters, shall be sufficient to satisfy this provision.
- 8. Automatic Reclosing. The Generator Owner is responsible for protecting his equipment from the effects of switching or automatic reclosing of the Borough's feeder circuits.
- c. Control, Protection and Safety Equipment Requirements Specific to Generators of 25 KW or less.

All Generator Owners 25 KW or less can be single phase. The following table describes necessary control, protection and safety equipment specific to generator of 25 KW or less connected to Secondary or Primary Voltage Systems:

Control, Protection and Safety Equipment for Generators of 25 KW<sup>1</sup> or Less Connected to Secondary System

Generator Size 25 KW or less

- Generator Disconnect Device
- Over-Current Trip
- Over-Voltage Trip
- Under Voltage Trip
- Over/Under Frequency Trip
- Synchronizing Check<sup>2</sup>
- Manual or Automatic

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<sup>1</sup> Exporting to the Borough system many require additional operational/protection devices.

<sup>2</sup> For synchronous and other type of generators with stand-alone capability.



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- d. Control, Protection and Safety Requirement Specific to Three Phase Synchronous Generators, Induction Generators, and Inverter Systems.

Generators greater than 25 kW but less than 500 kW must be three phase machines connected to three phase circuits.

1. Three Phase Synchronous Generators. Generator circuit breakers shall be three phase devices with electronic or electromechanical control. The Generation Owner is solely responsible for properly synchronizing his generator with the Borough system. For a synchronous generator, the excitation system response ratio shall not be less than 0.5 (five-tenth). The generator's excitation system(s) shall confirm, as near as reasonably achievable, to the field voltage vs. time criteria specified in American National Standards Institute Standard C50.13-1989 in order to permit adequate field forcing during transient conditions.
2. Three Phase Induction Generators and Inverter Systems. Induction generation may be connected and brought up to synchronous speed (as an induction motor) if it can be demonstrated that the initial voltage drop measured on the Borough side at the point of common coupling is within the visible flicker limits stated. Otherwise, the Generator Owner may be required to install hardware or other techniques to bring voltage fluctuations to acceptable levels. Line-commutated inverters do not require synchronizing equipment. Self-commutated inverters whether of the utility-interactive type or stand-alone type shall be used in parallel with the Borough system only with synchronizing equipment.

Control, Protection and Safety Equipment <sup>3</sup>  
 Less than 500KW Three Phase Connected to Primary System

Generator Disconnect Device		X
Over-Voltage Trip	X	
Under Voltage Trip		X
Over-Current Trip	X	
Over/Under Frequency Trip		X
Ground Over-Voltage Trip <sup>4</sup>		
OR		X
Ground Over-Current Trip		

<sup>3</sup> Exporting to the Borough system may require additional operating/protection devices and will require coordination of operations with the Borough.

<sup>4</sup> Selection depends on grounding system, if required, by the Borough.



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Synchronizing Check <sup>5</sup> – Manual or Automatic		
Power Direction <sup>6</sup>		X
Transfer Trip/Reclose Blocking <sup>7</sup>	X	

- e. Requirements Specific to Generators paralleling for 0.1 second or less (Closed Transition Switching)

The table below shows the protective functions required by this requirement for 0.1 second or less such as during source or load transfers.

Control, Protection and Safety Equipment

Generators Connected to Secondary or primary System Voltage

For 0.1 Second or Less

(Closed Transition Switching)

Generator Size

Up to 500 KW

Over-Voltage Trip	X	
Under Voltage Trip		X
Synchronizing Check <sup>8</sup> – Manual or Automatic		
Excessive Closed Time Trip <sup>9</sup>		X

- f. Inverter Type - DC Generation installations using inverters for interconnection with the Borough must use non-islanding type inverters as defined in IEEE 929, IEEE Recommended Practices for Utility Interface of Photovoltaic (PV) Systems (including Annex B, D, E & G) and UL Subject 1741, Nov 2005, Standard for Static Inverters and Charge Controllers for use in Photovoltaic Power Systems.
- g. Inspection and Start-Up Testing. The Generator Owner shall provide the Borough with reasonable prior notice at least 2 weeks before the initial energizing and start-up testing of the Generator Owner's generating equipment and the Borough, at its

<sup>5</sup> For synchronous and other types of generators with stand-alone capability.

<sup>6</sup> Required only if generator size is greater than Generator Owner's minimum load and capable of exporting. The relay will operate if the power flow from the generator into the Grid exceeds a predetermined level. A time delay will have to be incorporated into this relay to prevent it from operating during synchronous swings.

<sup>7</sup> May be required as part of any necessary transfer tripping/reclose blocking protection scheme.

<sup>8</sup> For synchronous and other types of generators with stand-alone capability.

<sup>9</sup> Scheme will trip generator if closed transition parallel mode remains in effect longer than 0.1 second.



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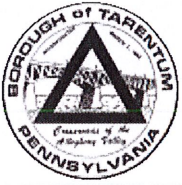
discretion, shall witness the testing of any equipment and protective systems associated with the interconnection. The Generator Owner shall revise and re-submit the application information for any proposed modification that may affect the safe and reliable operation of the Borough's system. The generator may be reconnected to the Borough system only after the modified application has been reviewed, testing has been confirmed and the Borough has given approval to reconnect.

- h. **Site Testing and Commissioning.** Testing of protection systems shall include procedures to functionally test all protective elements of the installation up to and including tripping of the generator and interconnection point. Testing and testing intervals should be in accordance with manufacturers' and industry recommendations. Testing will verify all protective set points and relay/breaker trip timing. The Borough may witness the testing of installed switchgear, protection systems, and generator. The Generator Owner is responsible for all maintenance of the generator, control and protective equipment. The Generator Owner will maintain records of such maintenance activities which the Borough may review at reasonable times.
- i. **Metering -** Metering requirements will be reviewed on each specific installation.
- j. **Dedicated Transformer.** A dedicated transformer may be required where the generating Generator Owner is served from the same transformer secondary as another Borough customer and inverter-based technology not meeting IEEE 929-1999 and IEEE 519-1992 specifications is used. In addition, a dedicated transformer or other current-limiting device is needed for any type of generator installation where the increase in available short circuit current could adversely impact other Borough customers on the same secondary circuit.
- k. **Applicable Standards.** All equipment and installations, and specifically generation installations, shall meet all requirements, including but not limited to safety and performance, of the current edition of the National Electrical Code, applicable Institute of Electrical and Electronic Engineers' (IEEE) standards, Underwriters Laboratories, the Borough's specific requirements, UL 1741 and IEEE 1547.

### **Section 1.5 - Penalties**

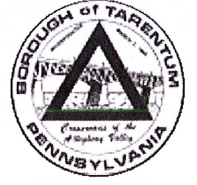
It shall be unlawful for any person to violate the provisions of this Ordinance. Any person violating the provisions of this Ordinance relating to the application, renewal, installation or maintenance of electric customer generation, shall be guilty of a summary offense and, upon conviction before a Magisterial District Judge having jurisdiction over same, be sentenced of a fine of not less than three hundred dollars (\$300) nor more than one thousand dollars (\$1,000) and, in default of payment





# BOROUGH OF TARENTUM

Allegheny County, Pennsylvania



## ORDINANCE #19-02

thereof, be sentenced to the maximum punishment provided for summary offenses under Pennsylvania Law.

The provisions of this Ordinance are severable. In the event any term or provision of this amendment are held to be void or invalid, the remaining provisions of this Ordinance shall remain in full force and effect.

**IN WITNESS WHEREOF**, this Ordinance is duly Ordained and Enacted by the Council of the Borough of Tarentum at a public meeting held this 7th day of March, 2019.

ATTEST:

BOROUGH OF TARENTUM

Michael L. Nestico, Borough Manager

Erika Josefowski, President of Council

EXAMINED AND APPROVED by me this 7th day of March, 2019.

David A. Regoli, Esq., Solicitor

Eric Carter, Mayor