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## Process Guideline for the Installation of Parallel Generating Systems (Greater than 10 kW)

The following process has been developed by the Electrical Safety Authority (ESA) to help avert costly delays in parallel generation projects.

A parallel generation project is any power production source that will be interconnected to a supply authority system, or Local Distribution Company (LDC).

This includes both renewable and non-renewable generation, as well as Energy Storage Systems (ESS), the output of which will be interconnected.

The process guideline for the installation of generating systems greater than 10kW is based on several Bulletins developed by ESA:

- [Bulletin 2-11-\\* Plans and Specifications](#)
- [Bulletin 2-7-\\* Approval of Electrical Equipment](#)
- [Bulletin 84-1-\\* Interconnection of Electric Power Production Sources](#)

Additional information developed by ESA related to renewable energy and Energy Storage Systems (ESS) installation can also be found in:

- [ESA-SPEC-004 Electrical guidelines for inverter-based micro-generating facility 10 kW and smaller;](#)
- [Guidelines for Field Evaluation Agencies](#)
- [Bulletin 2-21-\\* Electrical installations that are not compliant with the Ontario Electrical Safety Code](#)
- [Bulletin 64-5-\\* Installation of Solar Photovoltaic Systems](#)
- [Bulletin 64-2-\\* Grounding and bonding of solar photovoltaic systems](#)
- [Bulletin 6-7-\\* Hot splitters/Tapping existing services](#)

### General Requirements:

- (1) Rule 2-010(1)(d) of the Ontario Electrical Safety Code (OESC) requires plans and specifications for any installations involving consumer-owned, electric-power-generating equipment, with a rating in excess of 10 kW (Micro size) operating in parallel with the supply authority, to be submitted for ESA plan review.

When the electrical design for the generation project is completed and the plans and specifications are available, they should be submitted by the plans author, without delay to ESA Plan Review Department. See [Bulletin 2-11-\\*](#) for a list of what information is required to be submitted for review and where.

Due to the complex nature of Ground Potential Rise (GPR) studies and multiple generators connected to a common buss, ESA recommends the GPR and step and touch calculation be submitted as soon as possible for installations where the interconnection is at 750 volts or above, to alleviate serious safety concerns and delays in connection authorization.

- (2) OESC Rules 2-022 & 2-024 require electrical products be certified or approved for use.

Make arrangements with a Field Evaluation agency for approval of any electrical products, which are not already certified or approved for their intended application. This may include, but not limited to, generator, switchgear, protection and control relays, etc. See Bulletin [2-7-\\*](#) for a list of Field Evaluation Agencies accredited to operate in Ontario.

Wind generator machines are required to be certified or approved for use. Wind generator machine includes the wind generator and the supporting structure and all electrical infrastructure contained therein. Everything from the base of the structure out to the transformation and distribution will be governed by the OESC.

To establish a clear and concise code application point regarding products approval and to eliminate confusion and overlap of inspection agencies, the supporting structure and all electrical infrastructure contained therein falls under the auspices of Special Publication SPE 1000, prepared by the Canadian Standards Association and entitled "Model Code For the Field Evaluation of Electrical Equipment".

#### Energy Storage Systems (ESSs)

Rule 2-022 requires self-contained ESSs to be approved for use and/or sale (Reg. 438/07 in Ontario). To obtain approval, manufacturers must engage a certification agency accredited by the Standards Council of Canada and meet the requirements of ANSI/CAN/UL 9540-16 "Energy storage systems and equipment." Self contained ESSs may include equipment for charging, discharging, control, protection, power conversion, etc.

ESSs can be electrochemical (batteries, which are typical for residential solar PV installations), chemical (hydrogen fuel), mechanical (flywheel systems or compressed air) and thermal. ESSs can store very large amounts of energy, posing a potential fire or shock hazard when handled incorrectly. It is therefore crucial that these systems be evaluated and tested to ensure safe operation. Storage Systems composed of individual devices, assembled and connected onsite, need to meet the requirements of the Ontario Electrical Safety Code and can be accepted as part of a wiring installation.

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- (3) OESC Rule 84-002 requires the interconnection arrangements be in accordance with the requirements of the supply authority, or Local Distribution Company (LDC). Contact the LDC with respect to the interconnection location and protection and control scheme, contained in your electrical design. The protection and control shall comply with the requirements of Section 84 of the OESC, and be coordinated with the LDC system. See [Bulletin 84-1-\\*](#) for clarification to Section 84 requirements.
  - (4) The electrical contractor engaged in performing the electrical work shall file with the inspection department a completed notification of work as required by OESC Rule 2-004 and shall be a licensed electrical contractor in compliance with subparagraph (c), which states “Be in compliance with Ontario Regulation 570/05 made under Part VIII of the Electricity Act, 1998”. Often there is more than one electrical contractor working on projects such as these. Electrical contractors are responsible to file a notification for their scope of work.

OESC Rule 2-004(6) requires all electrical work to be inspected prior to being concealed or rendered inaccessible.

- (5) For inverter based micro generation systems 10kw or less it is not required to submit for plan review. Refer to guidelines ESA-SPEC-004 which sets out minimum requirements for these embedded systems.
- (6) Photovoltaic systems shall meet the minimum requirements of Section 64 of the OESC. Refer to [Bulletin 64-5-\\*](#) and [64-2-\\*](#) for more information about solar photovoltaic installation requirements.
- (7) Energy Storage Systems (ESS), the output of which operate in parallel with a supply authority system, shall meet the requirements of Sections 64 and 84.