

## **Grounding Of Generators In The Entertainment Industry**

### **What is the difference between grounding and bonding?**

**Grounding:** a (low impedance) connection to earth obtained by a grounding electrode(s). Sufficiently sized to carry any potential fault current and allows overcurrent devices to function correctly.

**Bonding:** a connection of all metal parts of any equipment in or near the system with a common (green) conductor. This provides a path for fault current back to the source to reduce the risk of shock. See EESCO document "Bonding Of Electrical Systems In The Entertainment Industry" for additional information.

### **What is required to ground my generator?**

One of the acceptable ground electrodes, a correctly sized copper ground conductor and approved connectors. All ground electrode connections should be verified and must be acceptable to local authorities having jurisdiction.

Ground Electrodes:

- a) two 10' ground rods spaced 10' apart (driven to full depth) \*
- b) one approved ground plate (typical 10" x 16" x 1/4"), buried 2' deep \*
- c) a buried metal water piping system, eg fire hydrant or water faucet
- d) an existing metal object of equivalent size and depth to a) or b) above.

\* **Call before you dig.** Make sure all underground services are located before installing ground electrodes.

See EESCO website ([www.eesco.ca](http://www.eesco.ca)) for existing ground location maps.

Ground Conductor:

A generator ground shall be run directly (max 50 m) between the ground electrode and the generator's ground connection point using a dedicated grounding conductor with no more than 2 in-line single pin connections.

Ground conductor size (from ESA SPEC-003 Table 3):

<b>1.1 Ampacity of Overcurrent Protection</b>	<b>Size of Copper Grounding Conductor AWG</b>
100 or less	4
101 to 200	2
201 to 300	2/0
301 and above	4/0

**Note:** When different electrical systems are in proximity to each other and do not share the same ground electrode they shall be bonded together. See EESCO document "Bonding Of Electrical Systems In The Entertainment Industry".

### **Where do I connect the ground electrode(s)?**

Connect the electrode to the ground point that is closest to the main output terminals of the generator.



**Main output terminals**



**Connection to existing ground electrode**



**Existing metal object**



**Ground Plate installation**

### **How can I verify my generator is grounded?**

All ground electrode connections should be verified with a ground proving device. For operating instructions contact device manufacturer or refer to EESCO website ([www.eesco.ca](http://www.eesco.ca)).

### **I have a small generator. Does it need to be grounded?**

Generators under 12kW that are frame grounded and use only cord and plug connected loads may not require connection to a ground electrode unless used to supply existing building systems. **All** other generators must be grounded. See OESC bulletin 10-20-3.

### **What if I have other questions?**

If you have further questions, visit the EESCO website ([www.eesco.ca](http://www.eesco.ca)), consult SPEC-003, the Ontario Electrical Safety Code Section 10 or call your ESA inspector.