GILA RIVER
FIRE DEPARTMENT REQUIREMENTS

Case Number: _____ **Date:** 09/07/2016 **Reviewer:** G. Lindenmier #0305

Project Name: Portable Generators – Special Events & Use

Location: WHPDA Property

Applicant: _____ **Phone**: _____

Applicant Address: _____

Portable Generators: GRIC Life Safety Code Title 21; ICC-IFC 2003, NFPA NFC-70, Title 29 CFR

- Portable generators shall be double bonded and grounded.
- Additional fuel shall be stored at a separate location and not within 20' of generator.
- Junction boxes shall be weather proof, in good working order and UL approved.
- Electrical connections and cords shall be industrial and in good condition.
- There shall be no trip hazards resulting from the generators.
- Generators shall be barricaded off from the general public being able to access.
- Emergency Shut-Off switches shall be accessible at all times.
- Shall not be located within 20' of any item that is flammable or combustible

250.26 Conductor to be Grounded - Alternating Current Systems. For AC premises wiring systems, the conductor to be grounded shall be specified in the following;

1. Single-phase, 2-wire-one conductor
2. Single-phase, 3-wire-the neutral conductor
3. Multiphase systems having one common to all phases-the neutral conductor
4. Multiphase systems where one phase is grounded-one phase conductor
5. Multiphase systems in which one phase is used as in (2) –the neutral conductor

250.34 Portable & Vehicle Mounted Generators.

A. Portable generators; The frame of a portable generator shall not be required to connect to a grounding electrode as defined in 250.52 for a system supplied by the generator under the following conditions:
    1. The generator supplies only equipment mounted on the generator, cord-and-plug-connected equipment through receptacles mounted on the generator, or both and
    2. The normal non-current-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are connected to the generator frame.

B. Vehicle-Mounted Generators; The frame of a vehicle shall not be required to be connected to grounding electrodes as defined in 250.52 for a system supplied by a generator located on this vehicle under the following conditions:
    1. The frame of the generator is bonded to the vehicle frame, and
    2. The generator supplies only equipment located on the vehicle or cord-to-plug-connected equipment through receptacles mounted on the vehicle, or both equipment

on the vehicle and cord-to-plug-connected equipment through receptacles mounted on the vehicle or on the generator, and

3. The normally non-current-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are connected to the generator frame.

C. Grounded Conductor Grounding; A system conductor that is required to be grounded by 250.26 shall be connected to the generator frame where the generator is a component of a separately derived system.

250.52 Grounding Electrodes; Electrodes Permitted for Grounding

(5) Rod & Pipe Electrodes; Rod and pipe electrodes shall not be less than 2.44m or (8 ft) in length and shall consist of the following materials.

a) Grounding electrodes of pipe or conduit shall not be smaller than metric designator 21(trade size ¾) and, where of steel , shall have the outer surface galvanized or otherwise metal-coated for corrosion protection.
b) Rod-type grounding electrodes of stainless steel and copper or zinc coated steel shall be at least 15.87mm (5/8 in) in diameter, unless listed.

(6) Other Listed Electrodes; Other listed grounding electrodes shall be permitted.

(B) Not Permitted for Use as Grounding Electrodes; The following systems and materials shall not be used as grounding electrodes:

1. Metal underground gas piping systems.
2. Aluminum

250.53 Grounding Electrode System Installation

A) Rod, Pipe, and Plate Electrodes. Rod, pipe and plate electrodes shall meet the requirements of 250.53(A)(1) through (A)(3).

1) Below Permanent Moisture Level. If practicable, rods, pipe and plate electrodes shall be embedded below permanent moisture level. Rod, pipe and plate electrodes shall be free from nonconductive coatings such as paint or enamel.
2) Supplemental Electrode Required. A single rod, pipe, or plate electrode shall be supplemented by an additional electrode of a type specified in 250.52(A)(2) through (A)(8). The supplemental electrode shall be permitted to be bonded to one of the following:
    1. Rod, Pipe or Plate Electrode
    2. Grounding electrode conductor
    3. Grounded service-entrance conductor
    4. Nonflexible grounded service raceway
    5. Any grounded surface enclosure

3) Supplemental Electrode. If multiple rod, pipe, or plate electrodes are installed to meet the requirements of this section, they shall not be less than 1.8m (6 ft) apart.

Portable Generators Set-up & Use Requirements

445.10 Location. Generators shall be of a type suitable for the locations in which they are installed.

445.12 Over current protection required.

445.14 Protection of live parts. Generators that operate at more than 50 volts to ground shall not be exposed to accidental contact where accessible to unqualified persons.

445.15 Guards for attendance. Where necessary for the safety of attendants the requirements of 430.233 shall apply.

445.18. Disconnecting means required for generators shall be equipped with a disconnect(s), lockable in the open position.

525.30 Equipment Bonding. The following equipment connected to the same source shall be bonded;

1. Metal raceways and metal-sheathed cable
2. Metal enclosures of electrical equipment
3. Metal frames and metal parts of portable structures, trailers, trucks, or other equipment that contain or support electrical equipment.

525.31 Equipment Grounding. All equipment to be grounded shall be connected to an equipment grounding conductor of a type recognized by 250.118 and in accordance with parte VI and VII of article 250.

1003.6 Means of egress continuity. The path of egress travel along a means of egress shall not be interrupted by any building element other than a means of egress component as specified in this chapter. Obstructions shall not be placed in the required width of a means of egress except projections permitted by this chapter. The required capacity of a means of egress system shall not be diminished along the path of egress travel.

2403.3 Place of assembly. For the purposes of this chapter, a place of assembly shall include a circus, carnival, tent show, theater, skating rink, dance hall or other place of assembly in or under which persons gather for any purpose.

2404.19 Separation of generators. Generators and other internal combustion power sources shall be separated from tents, canopies or membrane structures by a minimum of 20 feet (6096 mm) and shall be isolated from contact with the public by fencing, enclosure or other approved means.

OZONE-GAS GENERATOR. Equipment which causes the production of ozone.

- Ozone is considered a highly toxic gas. Ozone generators are addressed separately in Section 3705 because the code has traditionally dealt with the storage and use of hazardous materials, but not the generation.

Portable Generators Set-up & Use Requirements

3704.3.1.3 Ozone gas generators. The outdoor use of ozone gas-generating equipment shall be in accordance with Section 3705.

- This section refers to Section 3705 for requirements specific to ozone gas generators (see also commentary, Section 3704.2.1.3).

3705.1 Scope. Ozone gas generators having a maximum ozone-generating capacity of 0.5 pound (0.23 kg) or more over a 24-hour period shall be in accordance with this section.

Exception: Ozone-generating equipment used in Group R-3 occupancies.

- This section differs from most of the rest of this chapter because it deals with the generation (i.e., creation) of a highly toxic gas and not simply its storage or use. The requirements center on the design, location, piping integrity and methods of ozone generator shutdown.

- Ozone is a molecule composed of three atoms of oxygen. Two atoms of oxygen form the basic oxygen molecule, which is the oxygen we breathe.

- The third oxygen atom can detach from the ozone molecule and reattach to molecules of other substances, thereby altering their chemical composition. Generally, this ability to reattach is the reason ozone is generated and used as a method of purification. The primary uses are for the purification of water and air. The two uses are very different in their applications and the success of the air purification is a controversial one because it appears to be ineffective unless the ozone is present in the atmosphere at concentrations that would be harmful to people. Ozone is actually considered a pollutant when in the atmosphere we breathe.

- The ability of ozone to react with organic materials is why it is used in purification. It is this same ability that causes harm to humans. The following table is taken from documentation from the Environmental Protection Agency (EPA) regarding the health effects, risk factors

2403.3 Place of assembly. For the purposes of this chapter, a place of assembly shall include a circus, carnival, tent show, theater, skating rink, dance hall or other place of assembly in or under which persons gather for any purpose.

3404.2.3.1 Smoking and open flame. Signs shall be posted in storage areas prohibiting open flames and smoking. Signs shall comply with Section 3403.5.

- Warning signs prohibiting smoking and open flames are to comply with NFPA 704.

3404.2.5 Explosion control. Explosion control shall be provided in accordance with Section 911.

- The vapor from flammable and combustible liquids can cause an explosion when the vapor-air mixture is in an explosive ratio. Explosion control is required for a facility that is storing

or using Class IA liquids or for a facility that has open use or dispensing of Class IIB liquids. Section 911 requires deflagration venting to direct the force of an explosion out of the structure and into an unoccupied area. This section also references NFPA 69, which may require monitoring of gases and other methods to suppress factors affecting an explosion.

Portable Generators Set-up & Use Requirements

3403.2 Fire protection. Fire protection for the storage, use, dispensing, mixing, handling and on-site transportation of flammable and combustible liquids shall be in accordance with this chapter and applicable sections of Chapter 9.

3403.2.1 Portable fire extinguishers and hose lines. Portable fire extinguishers shall be provided in accordance with Section 906. Hose lines shall be provided in accordance with Section 905.

3403.6.4 Protection from vehicles. Guard posts or other approved means shall be provided to protect against vehicles.

2403.8.2 Location. Tents, canopies or membrane structures shall not be located within 20 feet (6096 mm) of lot lines, buildings, other tents, canopies or membrane structures, parked vehicles or internal combustion engines. For the purpose of determining required distances, support ropes and guy wires shall be considered as part of the temporary membrane structure, tent or canopy.

2404.19 Separation of generators. Generators and other internal combustion power sources shall be separated from tents, canopies or membrane structures by a minimum of 20 feet (6096 mm) and shall be isolated from contact with the public by fencing, enclosure or other approved means.