2023 NEC Study Guide For
"Generator Installations – Permanent Installations"

(This Study Guide was prepared by Gaylord Poe)

When a generator is permanently installed there are several installation details that should be reviewed. This study guide is intended to assist the installer by outlining several of these important details for review.

NEC Article 445 - In addition to other NEC Articles relative to the particular installation, all generator installations must comply with NEC 445. Let's review NEC 250.35, 445.11, 445.13, 445.18, and 445.20

Important Ground Fault Issues –

- An effective ground-fault return path must always be provided. NEC 250.35
- When the installation is a Nonseparately Derived System, compliance with NEC 250.35(B) maintains effective grounding.
- When the installation is a Separately Derived System, several NEC rules come into play **in addition** to compliance with NEC 250.35(A).

Separately Derived System –

- What determines if the generator installation is considered to be a Separately Derived System?
- What is a Separately Derived System? See NEC 100

Important System Grounding Issues –

- In a Nonseparately Derived System, the direct connection between the "normal" supply system's grounded (neutral) conductor and the generator's grounded (neutral) conductor in the transfer switch maintains connection to the building's grounding electrode system.
- In a Separately Derived System, there is no the direct connection between the "normal" supply system's grounded (neutral) conductor and the generator's grounded (neutral) conductor in the transfer switch.

- For a Separately Derived System, a connection to the building's grounding electrode system must be provided.

Other Applicable NEC Rules –

- NEC 250.35(A) sends us to 250.30. Where does 250.30 take us?
- Let's review NEC 250.30(A)(1) through (8)
- NEC 250.30(A)(6) and 250.30(A)(7) reference 250.64(A), (B), (C), and (E). Let's take a quick look at 250.64
- **Separate Building?**
- NEC 250.32 should also be reviewed for all generator installations. Is the generator inside or outside of the building? Is it remote?
- Grounding Electrode Requirements - NEC 250.32(A)
- Equipment Grounding - NEC 250.32(B)
- Remotely Located Disconnecting Means - NEC 250.32(D)
- Disconnecting Means Location – NEC 250.32(D) and 225.32 Exceptions 1 and 2
- NEC 250.32(D) Remotely Located Disconnecting Means – **Emergency Systems** – 700.12(D)(4) (*Must be SUSE rated – 225.36*)
- NEC 250.32(D) Remotely Located Disconnecting Means – **Legally Required Standby Systems** – 701.12(D)(3) (*Must be SUSE rated – 225.36*)
- NEC 250.32(D) Remotely Located Disconnecting Means – **Optional Standby Systems** (Portable over 15KW and all permanently installed) – 702.12 (A) (*Must be SUSE rated – 225.36*)

- All Remotely Located Disconnecting Means shall comply with NEC 250.32(D) (1) through (3). Let's review these conditions…