



# ELECTRICAL DISTRIBUTION

## Section 6.0

# Objectives

1. State the purposes of the electrical distribution system.
2. Define the following:
  - a. Offsite distribution
  - b. Onsite distribution
  - c. Class 1E distribution
  - d. Standby power source
  - e. Preferred power source.

# Objectives

3. Explain how a reliable source of power is ensured to the following:
  - a. The [4.16-kv and 480-vac](#) safety related distribution buses
  - b. The [125-vdc](#) instrumentation and control buses
  - c. The [120-vac](#) instrumentation buses.
4. Describe the response of the non-Class 1E electrical distribution system to a [turbine generator trip](#).
5. Describe the operation of the Class 1E electrical distribution system for all combinations of [loss of offsite power and engineered safety](#) features actuation signal.

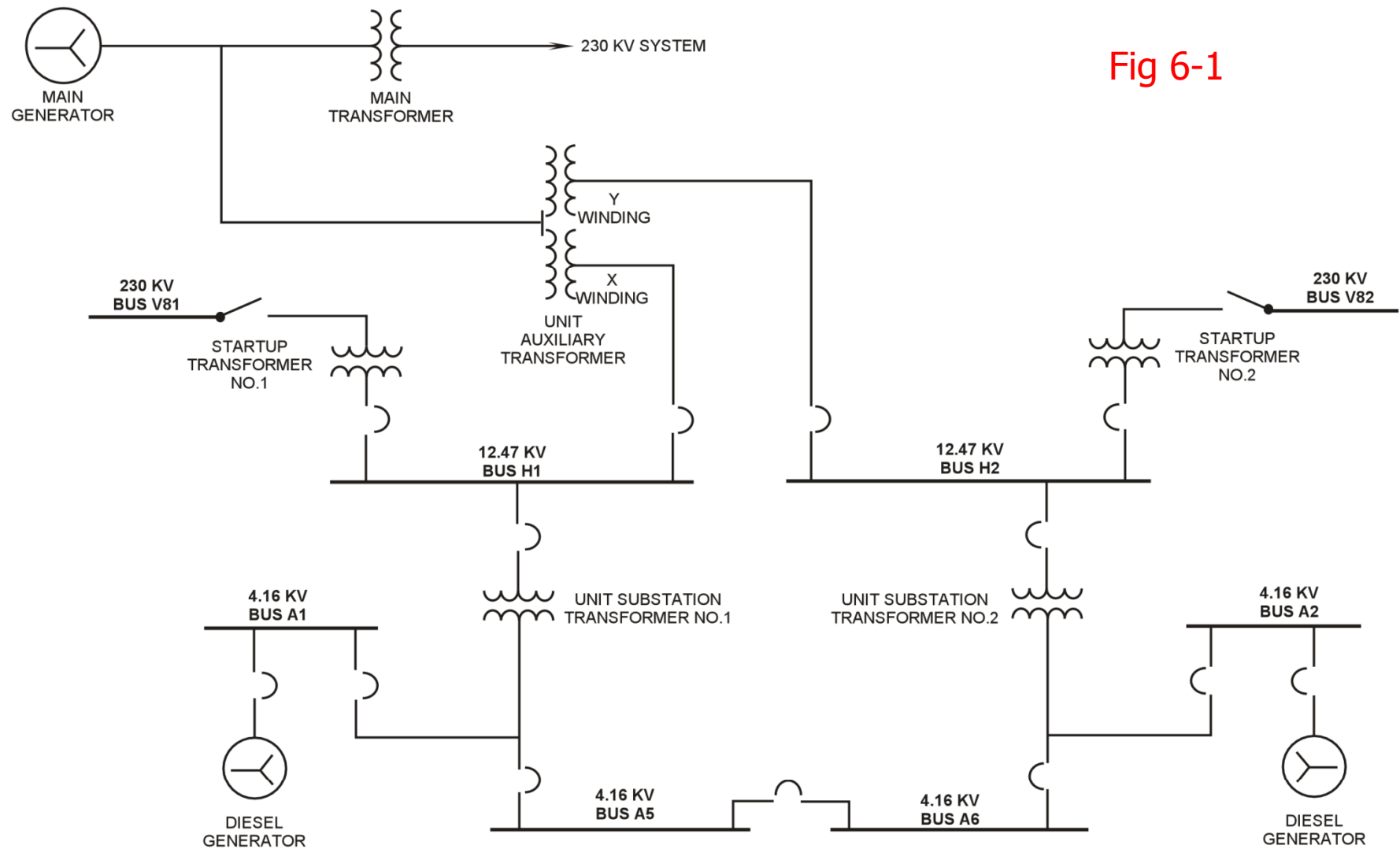
# Objectives

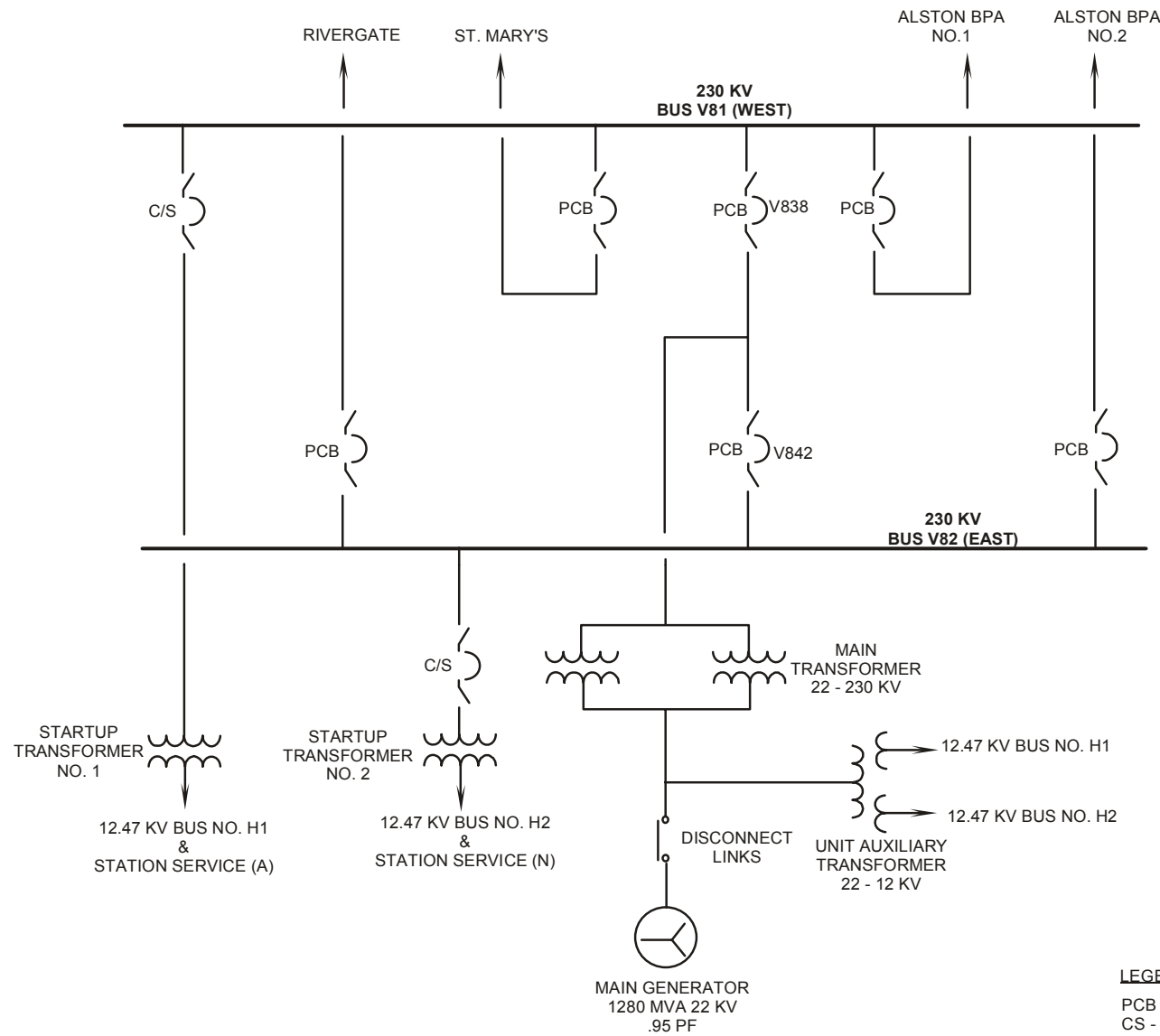
6. List the automatic start signals for the emergency diesel generators.
7. Explain the effect of an automatic start signal on the diesel generator protection system.
8. Explain why a station blackout in conjunction with a reactor coolant pump seal failure is a high contributor to core damage frequency.

# Purposes

1. Provide a reliable source of electrical power to the engineered safety features (ESF) equipment.
2. Provide a reliable source of control and instrumentation power.
3. Provide power to station auxiliary equipment.
4. Direct the main generator's output to the utility's distribution system.

Fig 6-1





**Fig 6-2**

**LEGEND**

PCB - POWER CIRCUIT BREAKER  
CS - CIRCUIT SWITCHER

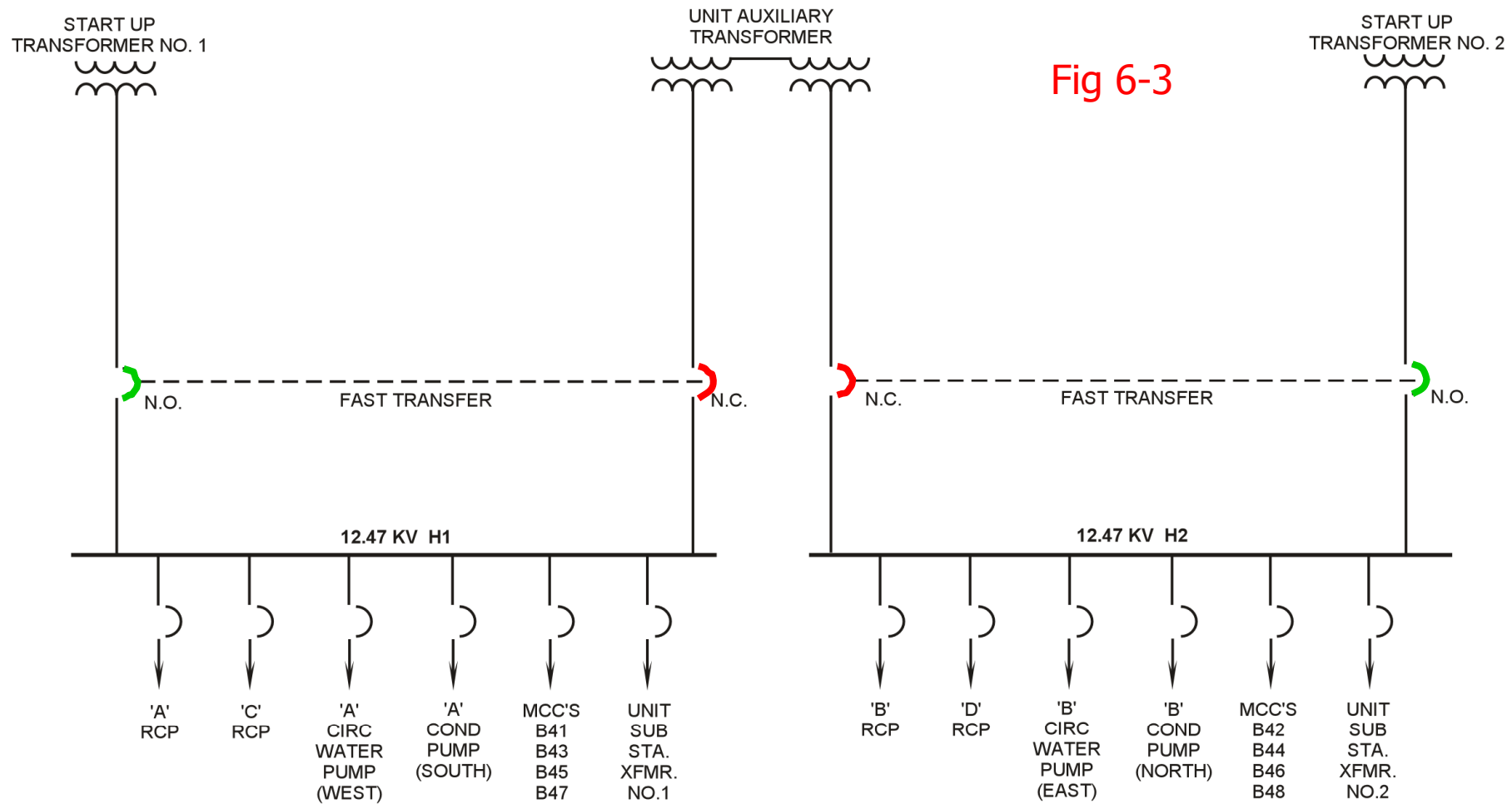




Fig 6-5

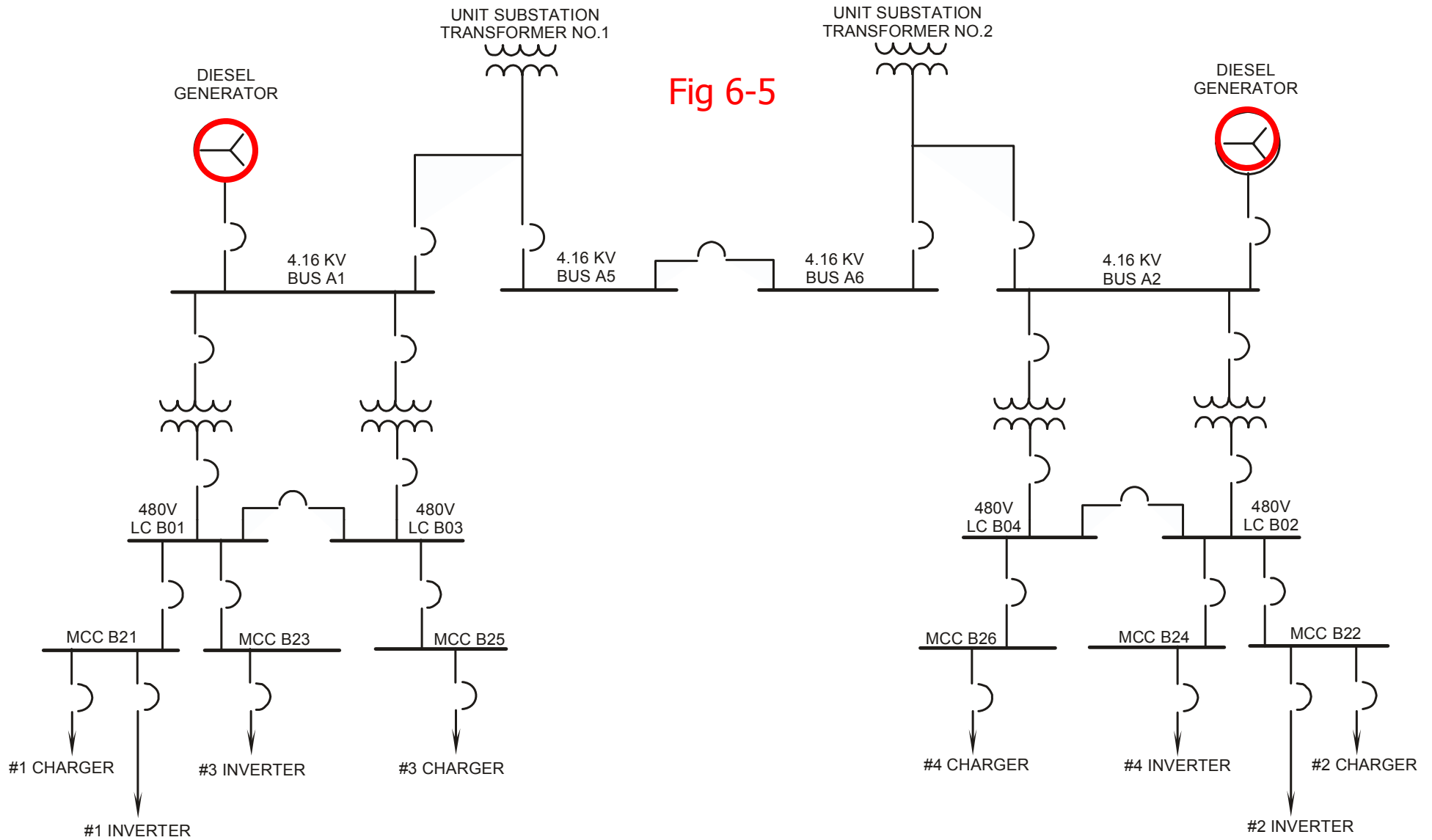
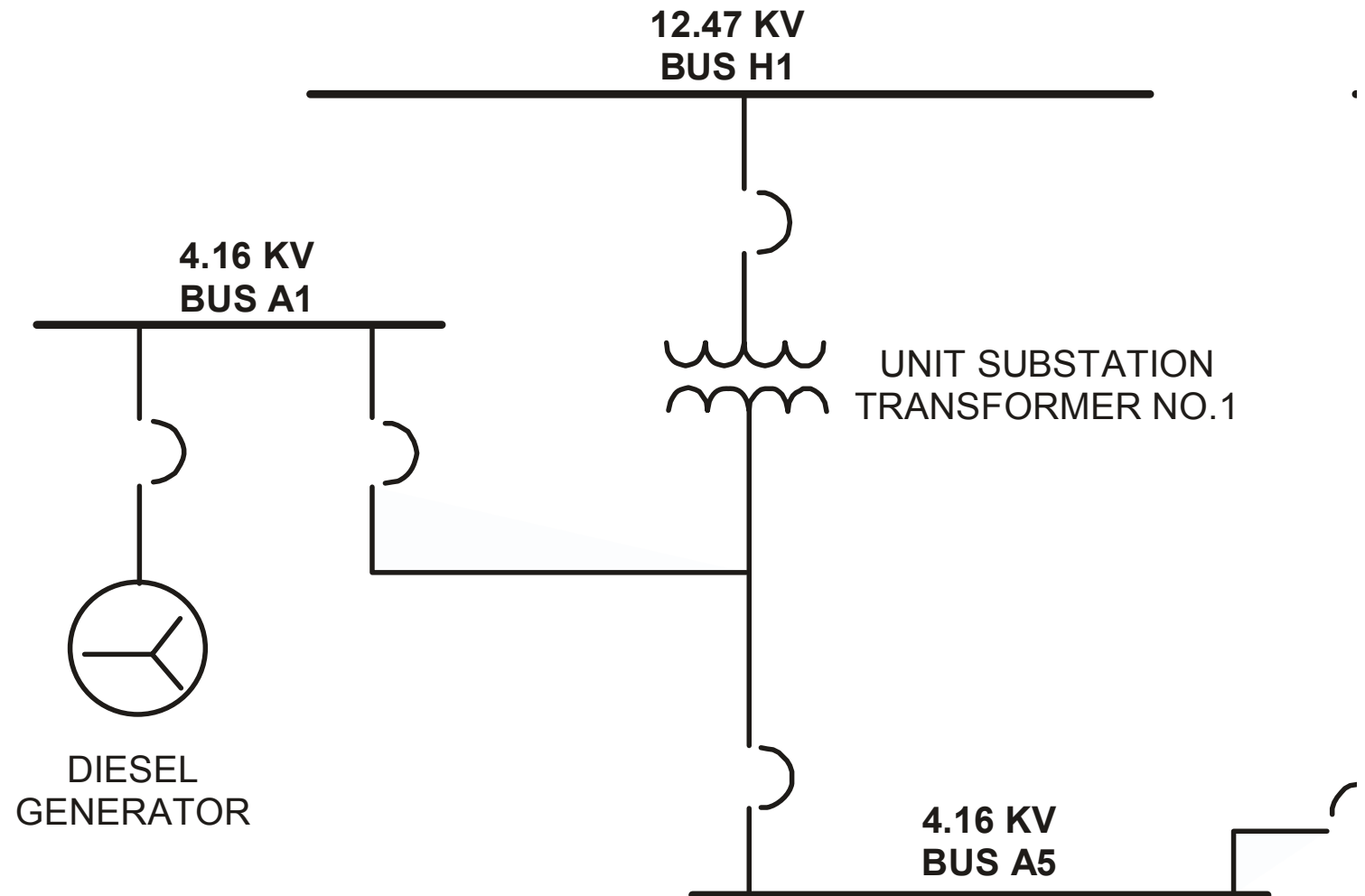


Fig 6-4



# Plant Response to SBO

- **Response of RCP seal:**
  - No seal injection; leakage up RCP shaft.
  - No CCW; loss of cooling to thermal barrier.
  - High temperature leakage can degrade seal package (300 gpm / RCP).
  - RCP seals leak to containment.
- **No AC power to restore inventory loss or remove decay heat.**

# Core Damage

**Initiating event SBO of prolonged duration:**

- **Assume no operator action.**
- **No RCS makeup & no decay heat removal.**
- **RCP seal failure will eventually occur.**
- **RCS inventory loss & depressurization due to seal failure.**
- **RCS becomes saturated & core becomes uncovered.**

Fig 6-6

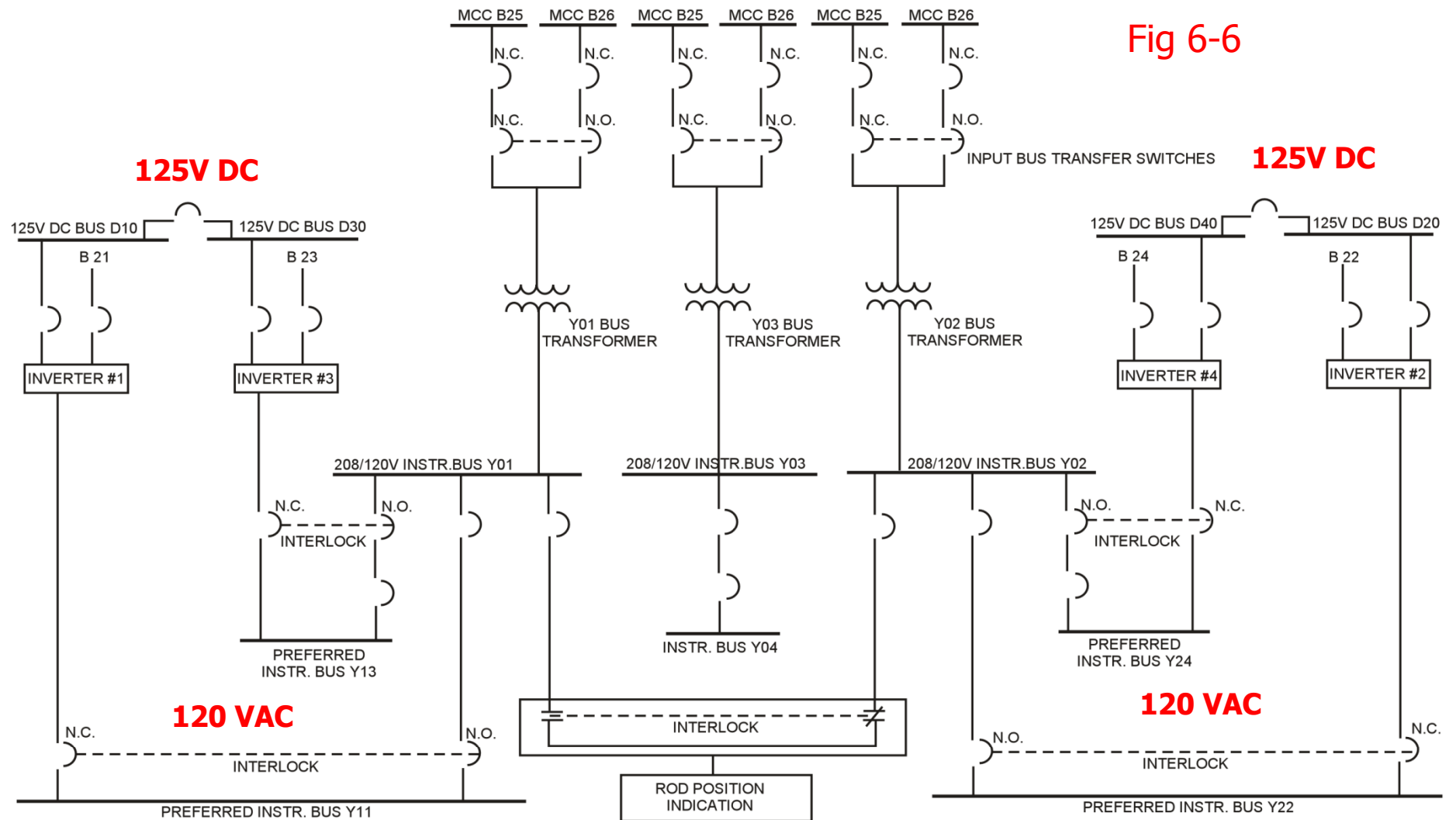


Fig 6-7

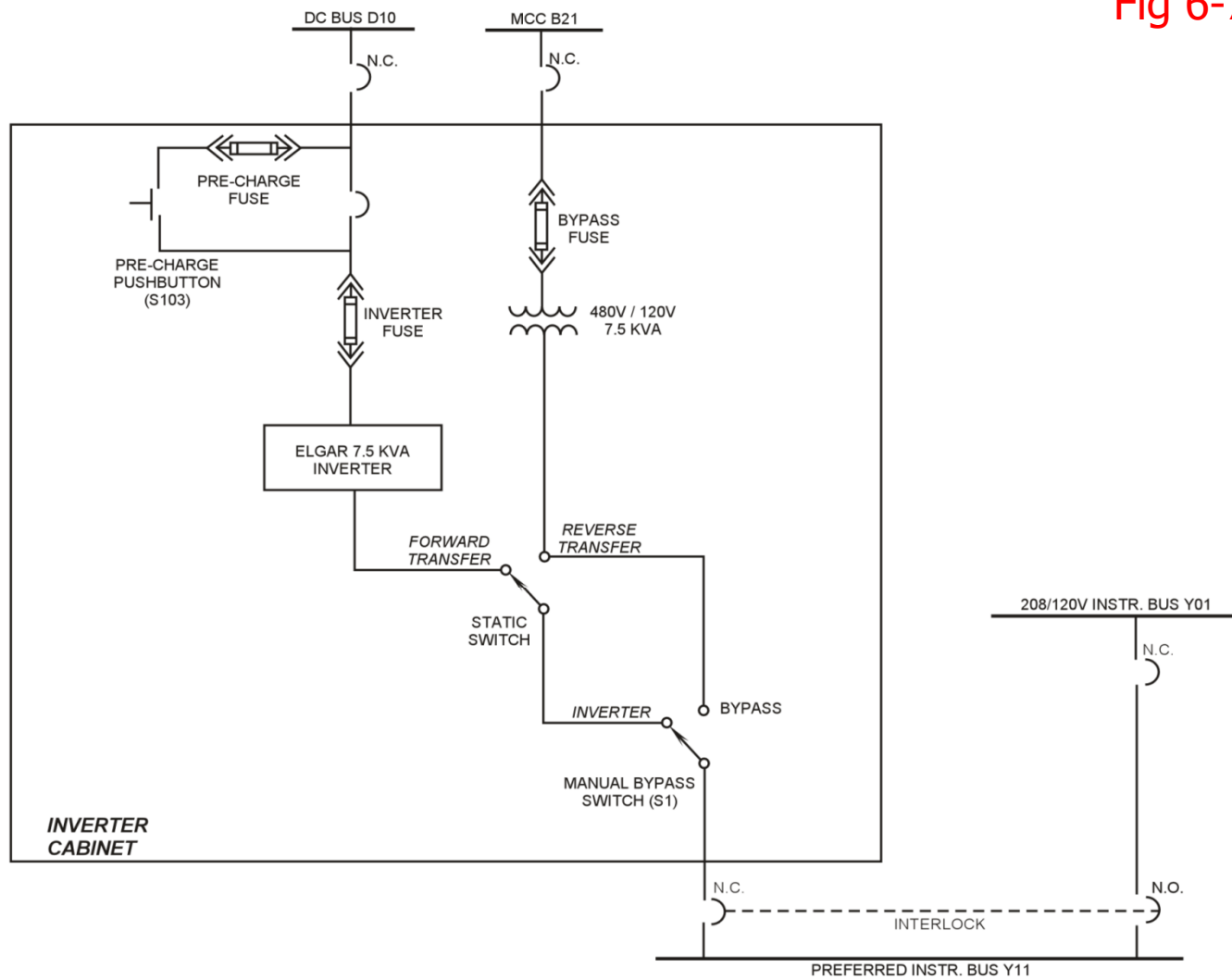


Figure 6-7 Inverter

Fig 6-8

