

PART THREE

INTERIOR SYSTEMS

CHAPTER 8

MEDIUM-VOLTAGE SYSTEMS

8-1. Interior medium-voltage work

Additional knowledge is required to provide protection from the electrical hazards of specialized electrical equipment used in interior medium-voltage electrical systems.

a. Applicability. The same safety background requirements covered in chapter 5 for outdoor medium-voltage substations will be applied. Consult the manufacturer's instruction manual and review the applicable safety directions given in chapter 5 for the type of apparatus being maintained. Only electrical workers with training and experience on medium-voltage circuits are qualified for the job. Unless specifically approved, work is not permitted on energized circuits. Temporary ground wires should be used to drain off all induced voltages and currents from live circuits, stored energy devices, and equipment metal guards before starting work.

b. Associated guidance. The worker should be familiar with the following pertinent facility maintenance manuals: TM 5-683/NAVFAC MO-116/AFJMAN 32-1083, chapter 12; TM 5-684/NAVFAC MO-200/AFJMAN 32-1082, chapter 1, section 2 and 3, and chapter 5 section 2; and, TM 5-685/NAVFAC MO-912, appendix E.

8-2. Medium voltage safety background

Review the applicable directions covered in chapter 5 for the type of apparatus being maintained before starting work. Additional specific equipment safety concerns should be covered by the manufacturer's instructions. All such instructions require the use of qualified electrical workers with training and experience on medium-voltage circuits who are familiar with the work to be performed. Equipment must be de-energized and grounded and worked on only by qualified facility maintenance personnel if accidents are to be avoided.

8-3. Motion hazards

Rotating electrical equipment such as motors and generators need guards to protect workers from accidental contact with live electrical parts, rotating

parts, and such areas where operating conditions provide hot machine surfaces. Rotation may loosen grounding connections and hold-down bolts and gray flexible or cord connections. Sparking of brushes can occur as well as insulation failures causing flame or molten metal to be ejected from open type motors or generators. Consider all these dangers when dealing with motors and generators.

8-4. Working on indoor equipment

Working on indoor equipment involves checking the safety aspects imposed by applicable codes for building premises.

a. Limitation of space. Space is usually at a premium. Clearances provided are usually less generous than for outdoor installations. Changes in NEC requirements may mean that older installations do not meet current clearance and entrance requirements for electrical rooms. Where installation do not conform to current NEC/OSHA requirements, additional safety instruction must be provided to maintenance workers. Ensure special attention is given to additional guarding of live parts where current NEC clearances are not met. Ensure that emergency exit routes are provided if clear exits do not meet current NEC requirements.

b. Grounding systems. Test that existing permanent electrical systems grounds are adequate for personnel protective grounding and provide additional temporary grounding to meet requirements given in paragraph 3-11.

c. Interconnection with other electric power sources. Check single line diagrams to assure that all inputs and interconnections to any electric power source are locked and tagged open. Verify single line diagram connections with the actual line connections of the applicable equipment.

d. Other existing systems. If the room's ventilation system is affected by the work, ensure that adequate temporary ventilation is provide. Fire protection and fire alarm systems, as they apply to the equipment and its installation space, may require

TM 5-682

temporary power and any interference with these systems must have the approval of the local fire marshal.

e. Other work area requirements. Noise abatement below that required by paragraph 3-3, may be required so as not to disturb personnel working in spaces adjoining the area where the maintenance work is required. The custodial service should be informed when they will be locked out of certain areas and of any additional trash removal for which their service will be responsible.