

## Chapter E 118

## SWITCHBOARDS

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**E 118.01 Location and accessibility.** (1) **GENERAL LOCATION.** Switchboards shall, where practicable, be so placed that the operator will not be endangered by any live or moving parts of machinery or equipment located near the board. They shall be so placed as to reduce to a minimum the danger of communicating fire to adjacent combustible material.

(2) **SPACES ABOUT BOARDS.** The space back of the board shall be kept clear of rubbish and shall not be used for storage.

(3) **ACCESSIBILITY.** Switchboards shall be accessible to authorized operators from both front and back when the connections are on the back (see section E 112.06 for working space), but may be placed against a wall when operating at not more than 750 volts with the wiring entirely on the face.

(4) **ARRANGEMENTS.** Switchboards shall have all switches so arranged that the points of control are readily accessible to the operator. Instruments, relays, and other devices requiring reading or adjustments shall be so placed that work can be readily performed from the working space.

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 118.02 Material and illumination.** (1) **MATERIAL.** Switchboards shall be made of noncombustible material and be kept free from moisture.

(2) **ILLUMINATION.** In attended stations sufficient illumination shall be provided both for the front and rear of the switchboard so that the switchboard may be readily operated and instruments conveniently read. (See section E 111.02).

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 118.03 Necessary equipment.** Switchboards which control generating equipment or outgoing supply circuits shall (except in substations without regular attendance) be equipped with such instruments as are necessary to show operating conditions. (See section E 115.06 for ground detectors).

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 118.04 Arrangement and identification.** Connections, wiring, and equipment of switchboards and panelboards shall be arranged in an orderly manner, and all switches, fuses, and circuit breakers shall be plainly marked or labeled on fixed parts of equipment or arranged so as to afford ready means for identifying circuits or equipment supplied through them, in accordance with section E 112.10.

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 118.05 Spacings and barriers against short-circuit.** (1) **BARE PARTS.** Switchboards shall have the number of bare parts at different potentials on any panel reduced to a minimum, and these parts shall be effectively separated. Protection or separation of such parts by suitable barriers is recommended where the voltage exceeds 750.

*Note:* It is recommended that such parts, including bus bars, should be so located, or provided with such insulating coverings or barriers, that parts at different potentials will not be readily short-circuited by tools or other conducting objects.

(2) **FUSES.** Fuses should be so located as to minimize the danger, in removing or replacing them, of short-circuiting parts at different potentials by the fuses or by the hands of the operator.

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 118.06 Switchboard grounding.** (1) **FRAMES.** Switchboard frames and non-current-carrying parts shall be effectively grounded under the conditions and with the exceptions noted in section E 112.04.

(a) *Exception:* Parts of switchboards, such as name plates, screws, and similar small parts which are not liable to become alive, except under very unusual circumstances, are not considered as coming under the rule and may be left ungrounded.

(2) **CIRCUITS WORKED ON.** Where protective grounds are occasionally required on circuits for the protection of workmen, an effective ground connection shall be provided, and also suitable means for effectively and readily connecting the parts being grounded to the ground connection, in accordance with subsection E 112.04(3).

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 118.07 Guarding live parts on switchboards.** (1) **GUARDS.** Live parts of switchboards shall be guarded in accordance with section E 112.05.

(2) **PLUG-TYPE SWITCHBOARDS.** Plug-type switchboards should, except while connections are being changed, have no current-carrying part exposed on face of boards and, if practicable, they and their plug connectors shall be so arranged where the operating voltage exceeds 150 as to have all current-carrying parts guarded so long as they are alive, even while connections are being changed.

(3) **EXPOSED PARTS OF MORE THAN 7,500 VOLTS.** No switchboard shall have current-carrying parts of more than 7,500 volts exposed (un-guarded) unless these parts are effectively isolated by elevation, except at times when occasionally left exposed by removal of covers or entrance into enclosures, such as switch and instrument-transformer cells or compartments which are ordinarily unoccupied by persons. For such parts, if exposed while alive for any purpose (including busses and disconnectors in compartments) working space shall be provided complying with the requirements under section E 112.06.

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 118.08 Instrument cases.** When mounted on switchboards, metal cases of instruments (unless isolated by elevation) operating at more than 750 volts shall be grounded or enclosed in suitable covers, which are either of grounded metal or of insulating material.

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.