

## Chapter E 112

## PROTECTIVE ARRANGEMENTS OF EQUIPMENT

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**E 112.01 General requirement.** All electrical equipment shall be of such construction and so installed and maintained as to reduce the life and fire hazard as far as practicable.

**History:** Cr. Register, January, 1968, No. 145, eff. 2-1-68.

**E 112.02 Inspections.** (1) **REGULAR EQUIPMENT.** Electrical equipment shall comply with these orders when placed in service and shall thereafter be cleaned when necessary and inspected at such intervals as experience has shown to be necessary. Any equipment or construction known to be defective so as to endanger life or property shall be promptly repaired, permanently disconnected, or isolated until repairs can be made. Repairs, additions and changes to electrical equipment and conductors shall be made by qualified persons only.

(2) **IDLE EQUIPMENT.** Infrequently used equipment or wiring maintained for future service should be thoroughly inspected before use to determine its fitness for service.

(3) **EMERGENCY EQUIPMENT.** Equipment or wiring maintained for emergency service should be periodically inspected and, where necessary, tested to determine its fitness for service.

(4) **NEW EQUIPMENT.** New equipment should be thoroughly inspected before being put in service.

**History:** Cr. Register, January, 1968, No. 145, eff. 2-1-68.

**E 112.03 Guarding shaft ends, pulleys and belts, and suddenly moving parts.** (1) **TRANSMISSION MACHINERY.** This code is supplemented by the rules on safety and other Department of Industry, Labor and Human Relations requirements which specify methods for safeguarding pulleys, belts, and other equipment used in the mechanical transmission of power.

(2) **SUDDENLY MOVING PARTS.** Parts of equipment which move suddenly in such a way that persons in the vicinity are liable to be injured by being struck, such as handles and levers of circuit breakers, shall be guarded or isolated.

**History:** Cr. Register, January, 1968, No. 145, eff. 2-1-68.

**E 112.04 Protective grounding.** (1) **GROUNDING METHOD.** All grounding which is intended to be a permanent and effective protection measure, such as lightning arrester, circuit, equipment, or wire raceway grounding, shall be made in accordance with the methods speci-

fied in Wis. Adm. Code chapter E 103 and NEC-1971 Article 250 except as changed in volume 2 (see section E 250.92).

(2) **GROUNDING, NONCURRENT-CARRYING METAL PARTS.** All electrical equipment, if operating at more than 150 volts to ground, or if in hazardous locations, regardless of voltage, shall have the exposed noncurrent-carrying parts, such as frames of generators and switchboards, cases of transformers, lightning arresters and switches, and operating levers, effectively grounded or isolated. It is recommended that exposed noncurrent-carrying parts of electrical apparatus operating at 150 volts or less to ground be effectively grounded. All metallic guards (including rails, screens, etc.) about electrical equipment should be effectively grounded where such grounding will reduce the hazard.

(a) Except in hazardous locations, exposed noncurrent-carrying parts of equipment operating at more than 150 volts to ground may be left ungrounded and either isolated, or guarded, or provided with insulating mats as required for live parts at the same voltage. Such isolation, guarding, or mats should be so arranged that persons cannot inadvertently touch these parts while also touching a grounded surface.

*Note:* Hazardous locations include those where dampness, acid fumes, explosives, inflammable gas, or flyings normally exist. (See chapter E 500)

(b) **Exception 1:** Exposed noncurrent-carrying metal parts of equipment of grounded direct-current circuits or series direct-current circuits are exempted from this order, if suitably insulated from the ground and from neighboring grounded surfaces. In addition suitable permanent insulating barrier guards shall be installed so that a person cannot, while touching such insulated frames, at the same time inadvertently touch or stand upon other grounded bodies.

(c) **Exception 2:** Exposed noncurrent-carrying metal parts of supply equipment for communication circuits are exempted from this order, provided they are suitably insulated from the ground and neighboring grounded conductors and surfaces.

(d) **Exception 3:** Metal shell sockets and metal guards of portable lamps, if suitably insulated, are exempted from this order.

(3) **GROUNDING EQUIPMENT DURING REPAIRS.** Electrical equipment or conductors normally operating at more than 750 volts on or about which work is occasionally done while separated from a source of electrical energy by switches or disconnectors only, shall be provided with some means, such as switches, connectors, or readily accessible ground conductor, for grounding them. (See sections E 142.04 and E 142.05)

**History:** Cr. Register, January, 1968, No. 145, eff. 2-1-68; am. (1), Register, April, 1972, No. 196, eff. 5-1-72.

**E 112.05 Guarding live parts.** It is the intent of this rule to require electrical facilities which are or may become alive to be arranged or guarded in such a way as to prevent inadvertent contact by persons or material. The rule requires guards unless the facilities have certain minimum clearances, are isolated by enclosure, or in some cases are arranged in such a way that contact cannot normally be made unless the person is insulated from ground. Station or substation buildings or enclosing walls or fences used to exclude the public or