HO-CHUNK NATION CODE (HCC)
TITLE 6 – PERSONNEL, EMPLOYMENT AND LABOR CODE
SECTION 8 – OCCUPATIONAL SAFETY AND HEALTH PROGRAM ACT OF 2002
SUBSECTION 4 – ELECTRICAL SAFETY

ENACTED BY LEGISLATURE: MAY 20, 2002

CITE AS: 6 HCC § 8-4

1. **Authority**. See basic document (Occupational Safety and Health Program Act).

2. **Purpose**. This subsection of the Occupational Safety and Health Program Act provides practices and procedures intended to provide for employee safety relative to electrical hazards in the workplace.

3. **Definitions**. See basic document (Occupational Safety and Health Program Act). In addition, the following definitions apply to this subsection.

a. "Accessible" as applied to wiring methods, means capable of being removed or exposed without damaging the building structure or finish, or not permanently closed in by the structure or finish of the building.

b. "Accessible" as applied to equipment, means admitting for close approach; not guarded by locked doors, elevation, or other effective means.

c. "Accessible, Readily (Readily Accessible)" means capable of being reached quickly for operation, renewal, or inspections, without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders, etc.

d. "Ampacity" means the current, in amperes, that a conductor can carry continuously under the conditions of use without exceeding its temperature rating.

e. "Attachment Plug (Plug Cap) or (Cap)" means a device that, by insertion in a receptacle, establishes a connection between the conductors of the attached flexible cord and the conductors connected permanently to the receptacle.

f. "Barricade" means a physical obstruction such as tapes, cones, or A-frame-type wood or metal structures intended to provide a warning about and to limit access to a hazardous area.

g. "Barrier" means a physical obstruction that is intended to prevent contact with equipment or live parts or to prevent unauthorized access to a work area.

h. "Bonding (Bonded)" means the permanent joining of metallic parts to form an electrically conductive path that will ensure electrical continuity and the capacity to conduct safely any current likely to be imposed.

i. "Bonding Jumper" means a reliable conductor to ensure the required electrical conductivity between metal parts required to be electrically.

j. "Branch Circuit" means the circuit conductors between the final overcorrect device protecting the circuit and the outlet(s).

k. "Circuit Breaker" means a device designed to open and close a circuit by nonautomatic means and to open the circuit automatically on a predetermined overcorrect without damage to itself when properly applied within its range.

l. "Concealed" means a rendered inaccessible by the structure or finish of the building. Wires in concealed raceways are considered concealed, even though they may become accessible by withdrawing them.

m. "Conductive" means a suitable for carrying electric current.

n. "Conductor" means any of the following:

(1) Bare Conductor. A conductor having no covering or electrical insulation whatsoever.

(2) Covered Conductor. A conductor encased within material of composition or thickness that is not recognized by this standard as electrical insulation.

(3) Insulated Conductor. A conductor encased within material of composition and thickness that it is recognized by this standard as electrical insulation.

o. "Deenergized" means free from any electrical connection to a source of potential difference and from electrical charge; not having a potential different from that of the earth.

p. "Device" means a unit of an electrical system that is intended to carry but not utilize electric energy.

q. "Disconnecting Means" means a device, group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply.

r. "Electrical Hazard" means a dangerous condition such that contact or equipment failure can result in electric shock, are flash burn, thermal burn, or blast.

s. "Electrical Safety" means recognizing hazards associated with the use of electrical energy and pain precautions so that the hazards do not cause injury or death.

t. "Electrically Safe Work Condition" means a state in which the conductor or circuit part to be worked on or near has been disconnected from energized parts, locked/tagged in accordance with established standards, tested to ensure the absence of voltage that grounded if determined necessarily

u. "Exposed" as applied to live parts, means capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts that are not suitably guarded, isolated, or insulated.

v. "Exposed" as applied to wiring methods, means on or attached to the surface or behind panels designed to allow access.

w. "Ground" means a conducting connection, whether intentional or accidental, between an electrical circuit or equipment and the earth, or to some conducting body that serves in place of the earth.

x. "Grounded" means connected to earth or to some conducting body that serves in place of the earth.

y. "Grounded Conductor" means a system or circuit conductor that is intentionally grounded.

z. "Grounded, Effectively" means intentionally connected to earth through a ground connection or connections of sufficiently low impedance and having sufficient current-carrying capacity to prevent the buildup of voltages that may result in undue hazards to connected equipment or to persons.

aa. "Grounding Conductor" means a conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes.

bb. "Ground-Fault Circuit-Interrupter" means a device intended for the protection of personnel that functions to de-energize a circuit or portion thereof within an established period of time when a current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protective device of the supply circuit.

cc. "Limited Approach Boundary" means a shock protection boundary to be crossed by only qualified persons (at a distance from a live part) which is not to be crossed by unqualified persons unless escorted by a qualified person.

dd. "Overcurrent" means any current in excess of the rated current of equipment or the ampacity of a conductor. It may result from overload, short circuit, or ground fault.

ee. "Overload" means the operation of equipment in excess of normal, full-load rating, or of a conductor in excess of rated ampacity that, when it persists for a sufficient length of time, would cause damage or dangerous overheating. A fault, such as a short circuit or ground fault, is not an overload.

ff. "Panelboard" means a single panel or group of panel units designed for assembly in the form of a single panel; including buses, automatic overcurrent devices, and equipped with or without switches for the control of light, heat, or power circuits; designed to be placed in a cabinet or cutout box placed in or against a wall or partition and accessible only from the front.

gg. "Qualified Person" means one familiar with the construction and operation of the equipment and the hazards involved.

hh. "Receptacle" means a contact device installed at the outlet for the connection of an attachment plug. A single receptacle is a single contact device with no other contact device on the same yoke. A multiple receptacle is two or more contact devices on the same yoke.

ii. "Restricted Approach Boundary" means a shock protection boundary to be crossed by only qualified persons (at a distance from a live part) which, due to its proximity to a shock hazard, requires the use of shock protection techniques and equipment when crossed.

jj. "Switchboard" means a large single panel, frame, or assembly of panels on which are mounted, on the face or back, or both, switches, overcurrent and other protective devices, buses, and usually instruments. Switchboards are generally accessible from the rear as well as from the front and are not intended to be installed in cabinets.

kk. "Voltage" of a circuit, means the greatest root-mean-square (rms) (effective) difference of potential between any two conductors of the circuit concerned.

ll. "Voltage, Nominal" means a nominal value assigned to a circuit or system for the purpose of conveniently designating its voltage class (as 120/240 volts, 480Y/277 volts, 600 volts). The actual voltage at which a circuit operates can vary from the nominal within a range that permits satisfactory operation of equipment.

mm. "Working Near" live parts, means any activity inside a limited approach boundary.

nn. "Working On" live parts, means coming in contact with live parts with the hands, feet, or other body parts, with tools, probes, or with test equipment, regardless of the PPE a person is wearing.

4. **Training Requirements**.

a. The training requirements contained in this section shall apply to employees who face a risk of electrical hazard that is not reduced to a safe level by the electrical installation requirements. Such employees shall be trained in safety-related work practices and procedural requirements as necessary to provide protection from the electrical hazards associated with their respective job or task assignments. Employees shall be trained to identify and understand the relationship between electrical hazards and possible injury.

b. The training required by this section shall be classroom or on-the-job type, or a combination of the two. The degree of training provided shall be determined by the risk to the employee.

c. Employees working on or near exposed energized electrical conductors or circuit parts shall be trained in methods of release of victims from contact with exposed energized conductors or circuit parts. They shall be regularly instructed in methods of first aid and emergency procedures, such as approved methods of resuscitation, if their duties warrant such training.

d. Qualified Persons.

(1) A qualified person shall be trained and knowledgeable of the construction and operation of equipment or a specific work method, and be trained to recognize and avoid the electrical hazards that might be present with respect to that equipment or work method. Such persons shall also be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools and test equipment. A person can be considered qualified with respect to certain equipment and methods, but still be unqualified for others. Such persons permitted to work within limited approach of exposed energized conductors and circuit pairs shall, at a minimum, be additionally trained in all of the following:

(a) The skills and techniques necessary to distinguish exposed energized parts from other parts of electric equipment.

(b) The skills and techniques necessary to determine the nominal voltage of exposed energized parts.

(c) The approach distances specified in Table I and the corresponding voltages to which the qualified person will be exposed.

(d) The decision-making process necessary to determine the degree and extent of the hazard and the PPE and job planning necessary to perform the task safely.

(2) An employee who is undergoing on-the-job training and who, in the course of such training, has demonstrated an ability to perform duties safely at his/her level of

training and who is under the direct supervision of a qualified person shall be considered to be a qualified person for the performance of those duties.

e. Unqualified Persons. Unqualified persons shall be trained in and be familiar with any of the electrical safety-related practices that might not be addressed specifically in this Section, but are necessary for their safety.

5. **Working On or Near Electrical Conductors or Circuit Parts**. Safety-related work practices shall be used to safeguard employees from injury while they are working on or near exposed electric conductors or circuit parts that are or can become energized. The specific safety-related work practice shall be consistent with the nature and extent of the associated electric hazards.

a. Live parts to which an employee might be exposed shall be put into an electrically safe work condition before an employee works on or near them, unless the employer can demonstrate that deenergizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations. Energized parts that operate at less than 50 volts to ground are not required to be deenergized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

(1) Examples of increased or additional hazards include, but are not limited to, interruption of life support equipment, deactivation of emergency alarm systems, shutdown of hazardous location ventilation equipment, or removal of illumination for an area.

(2) Examples of work that may be performed on or near exposed energized electrical conductors or circuit parts because of unfeasibility due to equipment design or operational limitations include performing diagnostics and testing (i.e. start-up or troubleshooting) of electric circuits that can only be performed with the circuit energized and work on circuits that form an integral part of a continuous process that would otherwise need to be completely shut down in order to permit work on one circuit or piece of equipment.

b. Only qualified persons shall be permitted to work on electrical conductors or circuit parts that have been put into an electrically safe work condition.

c. An electrically safe work condition shall be achieved when performed in accordance with paragraph 6 and verified by the following process:

(1) Determine all possible sources of electrical supply to the specific equipment. Check applicable up-to-date drawings, diagrams, and identification tags.

(2) After properly interrupting the load current, open the disconnecting device(s) for each source.

(3) Where it is possible, visually verify that all blades of the disconnecting devices are fully open or that drawout type circuit breakers are withdrawn to the fully disconnected position.

(4) Apply lockout/tag-out devices in accordance with a documented and established policy.

(5) Use an adequately rated voltage detector to test each phase conductor or circuit part to verify they are deenergized. Before and after each test, determine that the voltage detector is operating properly.

(6) Where the possibility of induced voltages or stored electrical energy exists, ground the phase conductors or circuit parts before touching them. Where it could be reasonably anticipated that the conductors or circuit parts being deenergized could contact other exposed energized conductors or circuit parts, apply ground-connecting devices rated for the available fault duty.

6. **Working On or Near Deenergized Electrical Conductors or Circuit Parts that Have Lock-Out/Tag-Out Devices Applied**. Each enterprise or department shall identify, document, and implement lock-out/tag-out procedures conforming to 6 HCC § 8-5 to safeguard employees from exposure to electrical hazards while they are working on or near deenergized electrical conductors or circuit parts that are likely to result in injury from inadvertent or accidental contact or equipment failure. The lock-out/tag-out procedure shall be appropriate for the experience and training of the employees and conditions as they exist in the workplace.

7. **Working On or Near Exposed Electrical Conductors or Circuit Parts that Are or Might Become Energized**. Where working on live parts that have not had lockout/tagout devices applied in accordance with 6 HCC § 8-5 shall apply to the work.

a. If the live parts are not placed in electrically safe work conditions, other safety-related work practices shall be used to protect employees who might be exposed to the electrical hazards involved. Such work practices shall protect each employee from arc flash and from contact with live parts directly with any part of the body or indirectly through some other conductive object. The work practices that are used shall be suitable for the conditions under which the work is to be performed and for the voltage level of the live parts.

b. Flash Hazard Analysis. Flash hazard analysis shall be done before a person approaches any exposed electrical conductor or circuit part that has not been placed in an electrically safe work condition.

(1) General. In certain instances, the flash protection boundary might be a greater distance than the limited approach boundary and the greater distance shall be utilized to trigger the need for PPE.

(2) Flash Protection Boundary. For systems which are 600 volts and below, the flash protection boundary shall be 4.0 ft, based upon the product of clearing times of 6 cycles (0.1 second) and available bolted fault current of 50 kA or any combination not exceeding 300 kA cycles (5000 ampere seconds). At voltage levels above 600 volts, the flash protection boundary is the distance at which the incident energy level equals 1.2 cal/cm^2. For situations where fault clearing time is 0.1 second (or faster), the flash protection boundary is the distance at which the incident energy level equals 1.5 cal/cm^2.

(3) Protective Clothing and PPE for Application with a Flash Hazard Analysis. Where it has been determined that work will be performed within the flash protection boundary by paragraph (2) above, the flash hazard analysis shall determine, and the enterprise/ department shall document, the incident energy exposure of the worker (in calories per square centimeter). This incident energy exposure level shall be based on the working distance of the employee's face and chest areas from a prospective arc source for the specific task to be performed. Flame Resistant (FR) Clothing and PPE shall be used by the employee based upon the incident energy exposure associated with the specific task. As an alternative, the PPE requirements of paragraph 10c(8) shall be permitted to be used in lieu of the detailed flash hazard analysis approach described in paragraph (2) above.

(4) Approach Boundaries to Live Parts. No qualified person shall approach or take any conductive object closer to live parts than the restricted approach boundary set forth in Table I (page 9), unless:

(a) The qualified person is insulated or guarded from the live parts (insulating gloves or insulating gloves and sleeves are considered insulation only with regard to the energized parts upon which work is being performed), and no insulated part of the qualified person's body enters the prohibited space set forth in Table I; or

(b) The live part is insulated from the qualified person and from any other conductive object at a different potential; or

(c) The qualified person is insulated from any other conductive object as during live-line bare-hand work.

(5) Unqualified Persons.

(a) Unqualified persons shall not be permitted to enter spaces that are required to be accessible to qualified employees only, unless the electric conductors and equipment involved are in an electrically safe work condition.

(b) Where an unqualified person(s) is (are) working at or close to the limited approach boundary, the designated person in charge of the work space where the electrical hazard exists shall cooperate with the designated person in charge of the unqualified person(s) to ensure that all work can be done safely. This shall include

advising the unqualified person(s) of the electrical hazard and warning him or her to stay outside of the limited approach boundary.

Table I: Approach Boundaries to Live Parts for Shock Protection.

(All dimensions are distance from live part to employee.)

(1) Nominal System Voltage Range, Phase to Phase	(2) Limited Approach Boundary Exposed Movable Conductor	(3) Limited Approach Boundary Exposed Fixed Circuit Part	(4) Restricted Approach Boundary; Includes Inadvertent Movement Adder	(5) Prohibited Approach Boundary
0 to 50	Not specified	Not specified	Not specified	Not specified
51 to 300	10 ft 0 in	3 ft 6 in	Avoid contact	Avoid contact
301 to 750	10 ft 0 in	3 ft 6 in	1 ft 0 in	0 ft 1 in
751 to 15 kV	10 ft 0 in	5 ft 0 in	2 ft 2 in	0 ft 7 in
15.1 kV to 36 kV	10 ft 0 in	6 ft 0 in	2 ft 7 in	0 ft 10 in
36.1 kV to 46 kV	10 ft 0 in	8 ft 0 in	2 ft 9 in	1 ft 5 in
46.1 kV to 72.5 kV	10 ft 0 in	8 ft 0 in	3 ft 3 in	2 ft 1 in
72.6 kV to 121 kV	10 ft 8 in	8 ft 0 in	3 ft 2 in	2 ft 8 in
138 kV to 145 kV	11 ft 0 in	10 ft 0 in	3 ft 7 in	3 ft 1 in
161 kV to 169 kV	11 ft 8 in	11 ft 8 in	4 ft 0 in	3 ft 6 in
230 kV to 242 kV	13 ft 0 in	13 ft 0 in	5 ft 3 in	4 ft 9 in
345 kV to 362 kV	15 ft 4 in	15 ft 4 in	8 ft 6 in	8 ft 0 in
500 kV to 550 kV	19 ft 0 in	19 ft 0 in	11 ft 3 in	10 ft 9 in
765 kV to 800 kV	23 ft 9 in	23 ft 9 in	14 ft 11 in	14 ft 5 in

8. **Work On or Near Uninsulated Overhead Lines.**

a. Uninsulated and Energized. Where work is performed in locations containing uninsulated energized overhead lines that are not guarded or isolated, precautions shall be taken to prevent employees from contacting such lines directly with any unguarded parts of their body or indirectly through conductive materials, tools, or equipment. Where the work to be performed is such that contact with uninsulated energized overhead lines is possible, the lines shall be deenergized and visibly grounded at the point of work, or suitably guarded.

b. Deenergizing or Guarding. If the lines are to be deenergized, arrangements shall be made with the person or organization that operates or controls the lines to deenergize them and visibly ground them at the point of work. If arrangements are made to use protective measures, such as guarding, isolating, or insulation, these precautions shall prevent each employee from contacting such lines directly with any part of his or her body or indirectly through conductive materials, tools, or equipment.

c. The enterprise/department and employee shall be responsible to ensure that guards or protective measures are satisfactory for the conditions. Employees shall comply with established work methods and the use of protective equipment.

d. Approach Distances for Unqualified Persons. When employees without electrical training are working on the ground or in an elevated position near overhead lines, the location shall be such that the employee and the longest conductive object the employee might contact cannot come closer to any unguarded, energized overhead power line than the limited approach boundary. If the voltage on the line exceeds 50 kV, the distance shall be 10 ft plus 4 in. for every 10 kV over 50 kV.

e. Vehicular and Mechanical Equipment.

(1) Where any vehicle or mechanical equipment structure will be elevated near energized overhead lines, they shall be operated so that the limited approach boundary distance of Table I, Column 2 is maintained. However, under any of the following conditions, the clearances shall be permitted to be reduced:

(a) If the vehicle is in transit with its structure lowered, the limited approach boundary to overhead lines shall be permitted to be reduced by 6 ft.

(b) If insulated barriers, rated for the voltages involved, are installed, and they are not part of an attachment to the vehicle, the clearance shall be permitted to be reduced to the design working dimensions of the insulating barrier.

(c) If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) shall be permitted to be reduced to the restricted approach boundary given in Table I, Column 4.

(2) Employees standing on the ground shall not contact the vehicle or mechanical equipment or any of its attachments, unless:

(a) The employee is using protective equipment rated for the voltage; or

(b) The equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line than permitted in (a) above.

(3) If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is intentionally grounded, employee working on the ground near the point of grounding may not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials (step and touch potential), which can develop within a few feet or more outward from the grounded point.

9. **Electrical Safety Program**.

a. Job Briefing.

(1) Before starting each job, the employee in charge shall conduct a job briefing with the employees involved. The briefing shall cover such subjects as hazards associated with the job, work procedures involved, special precautions, energy source controls, and PPE requirements.

(2) If the work or operations to be performed during the work day or shift are repetitive and similar, at least one job briefing shall be conducted before the start of the first job of the day or shift. Additional job briefings shall be held if significant changes that might affect the safety of the employees occur during the course of the work.

(3) A brief discussion shall be satisfactory if the work involved is routine and if the employee, by virtue of training and experience, can reasonably be expected to recognize and avoid the hazards involved in the job. A more extensive discussion shall be conducted if:

(a) The work is complicated or particularly hazardous, or

(b) The employee cannot be expected to recognize and avoid the hazards involved in the job.

b. Alertness.

(1) Employees shall be instructed to be alert at all times when they are working near live parts an in work situations where unexpected electrical hazards might exist.

(2) Employees shall not knowingly be permitted to work in areas containing live parts or other electrical hazards while their alertness is recognizably impaired due to illness, fatigue, or other reasons.

c. Blind Reaching. Employees shall be instructed not to reach blindly into areas that might contain live parts.

d. Illumination.

(1) Employees shall not enter spaces containing live parts unless illumination is provided that enables the employees to perform the work safely.

(2) Where lack of illumination or an obstruction precludes observation of the work to be performed, employees shall not perform any task near live parts.

e. Conductive Articles Being Worn. Conductive materials, tools, and equipment that are in contact with any part of an employee's body shall be handled in a manner that will prevent accidental contact with live parts. Such materials and equipment include but are

not limited to long conductive objects, such as ducts, pipes and tubes, conductive hose and rope, metal-lined rules and scales, steel tapes, pulling lines, metal scaffold parts, structural members, bull floats, and chains.

f. Conductive Materials, Tools, and Equipment Being Handled.

(1) Conductive materials, tools, and equipment that are in contact with any part of an employee's body shall be handled in a manner that will prevent accidental contact with live parts. Such materials and equipment include but are not limited to long conductive objects, such as ducts, pipes and tubes, conductive hose and rope, metal-lined rules and scales, steel tapes, pulling lines, metal scaffold parts, structural members, bull floats, and chains.

(2) Means shall be employed to ensure that conductive materials approach live parts no closer than that permitted by Table I.

g. Insulated Tools and Equipment.

(1) Employees shall use insulated tools and/or handling equipment when working inside the limited approach boundary of live parts where tools or handling equipment might make accidental contact. Insulated tools shall be protected from damage to the insulating material.

(2) Fuse or fuse holder handling equipment, insulated for the circuit voltage, shall be used to remove or install a fuse if the fuse terminals are energized.

(3) Ropes and hand-lines used near live parts shall be nonconductive.

h. Protective Shields. Protective shields, protective barriers, or insulating materials shall be used to protect each employee from shock, burns, or other electrically related injuries while that employee is working near live parts which might be accidentally contacted or where dangerous electric heating or arcing might occur. When normally enclosed live parts are exposed for maintenance or repair, they shall be guarded to protect unqualified persons from contact with the live parts.

i. Portable Ladders. Portable ladders shall have nonconductive side rails if they are used where the employee or the ladder could contact live parts.

j. Confined or Enclosed Work Spaces. When an employee works in a confined or enclosed space that contains live parts, the employee shall use protective shields, protective barriers, or insulating materials as necessary to avoid inadvertent contact with these parts. Doors, hinged panels, and the like shall be secured to prevent their swinging into an employee and causing the employee to contact live parts.

k. Safety Interlocks. Only a qualified person following the requirements for working inside the restricted approach boundary shall be permitted to defeat or bypass an electrical safety interlock over which the person has sole control and then only temporarily while the qualified person is working on the equipment. The safety interlock system shall be returned to its operable condition when the work is complete.

l. Housekeeping Duties. Where live parts present an electrical hazard, employees shall not performs housekeeping duties inside the limited approach boundary where there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided to prevent contact. Electrically conductive cleaning materials (including conductive solids such as steel wool, metabolized cloth, and silicone carbide, as well as conductive liquid solution) shall not be used inside the limited approach boundary unless procedures to prevent electrical contact are followed.

m. Occasional Use of Flammable Materials. Where flammable materials are present only occasionally, electric equipment capable of igniting them may not be used, unless measures are taken to prevent hazardous conditions from developing. Such materials include, but are not limited to: flammable gases, vapors, or liquids; combustible dust; and ignitable fibers or flying.

n. Overcorrect Protection Modification. Overcorrect protection of circuits and conductors shall not be modified, even on a temporary basis.

10. **Personal and Other Protective Equipment**.

a. Employees working areas where there are electrical hazards shall be provided with, and shall use, protective equipment that is designed and constructed for the specific part of the body to be protected and for the work to be performed.

b. Care of Equipment. Protective equipment shall be maintained in a safe, reliable condition. The protective equipment shall be visually inspected before each use.

c. Personal Protective Equipment.

(1) When an employee is working within the flash protection boundary he/she shall wear protective clothing and other PPE.

(2) When flame-resistant, flame-retardant head protection wherever there is a danger of head injury from electric shock or burns due to contact with live parts or from flying objects resulting from an electrical explosion.

(3) Head, Face, Neck, and Chin Protection. Employees shall wear nonconductive head protection wherever there is a danger of head injury from electric shock or burns due to contact with live parts or from flying objects resulting from an electrical explosion.

(4) Eye Protection. Employees shall wear protective equipment for the eyes whenever there is danger of injury from electric arcs, flashes, or from flying objects resulting from electrical explosion.

(5) Body Protection. Employees shall wear clothing resistant to flash flame wherever there is possible exposure to an electric arc flash. Such clothing can be provided as shirt and trousers, or as coveralls, or as a combination of jacket and trousers, or, for maximum protection, as coveralls and jacket. The higher degree of protection is provided by heavier weight fabrics or by layering combinations of natural fiber clothing resistant to electric arc flash.

(6) Hand and Arm Protection. Employees shall wear rubber insulating gloves where there is danger of hand and arm injury from electric shock and burns due to contact with live parts. Hand and arm protection shall be worn where there is possible exposure to arc flash burn.

(7) Foot and Leg Protection. Where insulated footwear is used as protection against step and touch potential, dielectric overshoes shall be required.

(8) Selection of PPE.

(a) PPE Required for Various Tasks.

1 Listed in Table II (page 15) are a number of common work tasks with the respective Hazard/Risk Category associated with each task. Once the Hazard/Risk Category has been identified, refer to Table III. The assumed normal short circuit current capacities and fault clearing times for various tasks conducted on low-voltage equipment are listed in Table II. For tasks not listed or for power systems of greater than the assumed normal short circuit current capacity or for longer than assumed fault clearing times, a flash hazard analysis is required.

2 Energized parts that operate at less than 50 volts are not required to be de-energized to satisfy an "electrically safe work condition." Consideration should be given to the capacity of the source, any overcorrect protection between the energy source and the worker, and whether the work task related to the source operating at less than 50 volts increases exposure to electrical burns or to explosion from an electric arc.

(b) Once the Hazard/Risk Category has been identified, refer to Table III. This Table lists the requirements for protective equipment based on Hazard/Risk Category numbers 0 – 4. This clothing and equipment shall be used when working on or near energized equipment within the Flash Protection Boundary.

(c) The PPE requirements of this section are intended to protect a person from arc-flash and shock hazards. While some situations may result in burns to the skin, even

with the protection described in Table III, any burn injury should be relatively minor and survivable. Due to the explosive effect of some arc events, physical trauma injuries may occur. The PPE requirements of this section do not provide protection against physical trauma.

Table II: Hazard Risk Category Classification

Task (Assumes Equipment Is Energized, and Work Is Done Within the Flash Protection Boundary)	Hazard/Risk Category	V-rated Gloves	V-rated Tools
Panelboards rated 240 V and below – Notes 1 and 3	---	---	---
Circuit breaker (CB) or fused switch operation with covers on	0	N	N
CB or fused switch operation with covers off	0	N	N
Work on energized parts, including voltage testing	1	Y	Y
Remove/install CBs or fused switches	1	Y	Y
Removal of bolted covers (to expose bare, energized parts)	1	N	N
Opening hinged covers (to expose bare, energized parts)	0	N	N
Panelboards or Switchboards rated >240 V and up to 600 V (with molded case or insulated case circuit breakers) – Notes 1 and 3	---	---	---
CB or fused switch operation with covers on	0	N	N
CB or fused switch operation with covers off	1	N	N
Work on energized parts, including voltage testing	2*	Y	Y
600V Class Motor Control Centers (MCCs) – Notes 2 (except as indicated) and 3	---	---	---
CB or fused switch or starter operation with enclosure doors closed	0	N	N
Reading a panel meter while operating a meter switch	0	N	N
CB or fused switch or starter operation with enclosure doors open	1	N	N
Work on energized parts, including voltage testing	2*	Y	Y
Work on control circuits with energized parts >120 V exposed	2*	Y	Y
Insertion or removal of individual starter "buckets" from MCC – Note 4	3	Y	N
Application of safety grounds, after voltage test	2*	Y	N
Removal of bolted covers (to expose bare, energized parts)	2*	N	N
Opening hinged covers (to expose bare, energized parts)	1	N	N
600 V Class Switchgear (with power circuit breakers or fused switches – Notes 5 and 6	---	---	---
CB or fused switch operation with enclosure doors closed	0	N	N
Reading a panel meter while operating a meter switch	0	N	N
CB or fused switch operation with enclosure doors open	1	N	N
Work on energized parts, including voltage testing	2*	Y	Y
Work on control circuits with energized parts 120 V or below, exposed	0	Y	Y
Work on control circuits with energized parts >120 V exposed	2*	Y	Y
Insertion or removal (racking) of CBs from cubicles, doors open	3	N	N
Insertion or removal (racking) of CBs from cubicles, doors closed	2	N	N
Application of safety grounds, after voltage test	2*	Y	N
Removal of bolted covers (to expose bare, energized parts)	3	N	N
Opening hinged covers (to expose bare, energized parts)	2	N	N
Other 600 V Class (277 V through 600 V, nominal) Equipment – Note 3	---	---	---
Lighting or small power transformers (600 V, maximum)	---	---	---
Removal of bolted covers (to expose bare, energized parts)	2*	N	N
Opening hinged covers (to expose bare, energized parts)	1	N	N
Work on energized parts, including voltage testing	2*	Y	Y
Application of safety grounds, after voltage test	2*	Y	N
Revenue meters (kW-hour, at primary voltage and current)	---	---	---
Insertion or removal	2*	Y	N
Cable trough or tray cover removal or installation	1	N	N
Miscellaneous equipment cover removal or installation	1	N	N
Work on energized parts, including voltage testing	2*	Y	Y
Application of safety grounds, after voltage test	2*	Y	N
NEMA E2 (fused contactor) Motor Starters, 2.3 kV through 7.2 kV	---	---	---
Contactor operation with enclosure doors closed	0	N	N
Reading a panel meter while operating a meter switch	0	N	N
Contactor operation with enclosure doors open	2*	N	N
Work on energized parts, including voltage testing	3	Y	Y
Work on control circuits with energized parts 120 V or below, exposed	0	Y	Y
Work on control circuits with energized parts >120V, exposed	3	Y	Y
Insertion or removal (racking) of starters from cubicles, doors open	3	N	N
Insertion or removal (racking) of starters from cubicles, doors closed	2	N	N

Application of safety grounds, after voltage test	3	Y	N
Removal of bolted covers (to expose bare, energized parts)	4	N	N
Opening hinged covers (to expose bare energized parts)	3	N	N
Metal Clad Switchgear, 1 kV and above	---	---	---
CB or fused switch operation with enclosure doors closed	2	N	N
Reading a panel meter while operating a meter switch	0	N	N
CB or fused switch operation with enclosure doors open	4	N	N
Work on energized parts, including voltage testing	4	Y	Y
Work on control circuits with energized parts 120 V or below, exposed	2	Y	Y
Work on control circuits with energized parts >120V, exposed	4	Y	Y
Insertion or removal (racking) of CBs from cubicles, doors open	4	N	N
Insertion or removal (racking) of CBs from cubicles, doors closed	2	N	N
Application of safety grounds, after voltage test	4	Y	N
Removal of bolted covers (to expose bare, energized parts)	4	N	N
Opening hinged covers (to expose bare, energized parts)	3	N	N
Opening voltage transformer or control power transformer compartments	4	N	N
Other Equipment 1 kV and above	---	---	---
Metal clad load interrupter switches, fused or unfused	---	---	---
Switch operation, doors closed	2	N	N
Work on energized parts, including voltage testing	4	Y	Y
Removal of bolted covers (to expose bare, energized parts)	4	N	N
Opening hinged covers (to expose bare, energized parts)	3	N	N
Outdoor disconnect switch operation (hookstick operated)	3	Y	Y
Outdoor disconnect switch operation (gang-operated, from grade)	2	N	N
Insulated cable examination, in manhole or other confined space	4	Y	N
Insulated cable examination, in open area	2	Y	N

Legend:
V-rated Gloves are gloves rated and tested for the maximum line-to-line voltage upon which work will be done.
V-rated Tools are tools rated and tested for the maximum line-to-line voltage upon which work will be done.
2* means that a double-layer switching hood and hearing protection are required for this task in addition to the other Hazard/Risk Category 2 requirements of Table III.
Y = yes (required)
N = no (not required)
Notes:
1. 25 kA short circuit current available, 0.03 second (2 cycle) fault clearing time.
2. 65 kA short circuit current available, 0.03 second (2 cycle) fault clearing time.
3. For <10 kA short circuit current available, the Hazard/Risk Category required may be reduced by one Number.
4. 65 kA short circuit current available, 0.33 second (20 cycle) fault clearing time.
5. 65 kA short circuit current available, up to 1.0 seconds (60 cycle) fault clearing time.
6. For <25 kA short circuit current available, the Hazard/Risk Category required may be reduced by one Number.

d. Protective Clothing.

(1) Table IV lists the characteristics and degree of protection for various clothing. The protective clothing selected for the corresponding Hazard/Risk Category number shall have an arc thermal performance exposure value (ATPV) of at least the value listed in the last column of Table IV. The ATPV for a particular for a particular clothing system may be obtained from the FR clothing manufacturer.

(2) Factors in Selection of Protective Clothing.

(a) Protective clothing includes shirts, pants, coveralls, jackets, and parkas worn routinely by workers who, under normal working conditions, are exposed to momentary electric arc and related thermal hazards. Arc and flame resistant rainwear worn in inclement weather are included in this category.

(b) Clothing and equipment that maximize worker protection shall be utilized. Clothing and equipment required by the degree of exposure shall be permitted to be worn

Table III: Protective Clothing and Personal Protective Equipment (PPE) Matrix

Protective Clothing & Equipment	**Protective Systems for Hazard/Risk Category**					
Hazard/Risk Category	**-1**	**0**	**1**	**2**	**3**	**4**
Number	(Note 3)					
Untreated Natural Fiber	---	---	---	---	---	---
a. T-shirt (short-sleeve)	X			X	X	X
b. Shirt (long-sleeve)		X				
c. Pants (long)	X	X	X (Note 4)	X (Note 6)	X	X
FR Clothing (Note 1)	---	---	---	---	---	---
a. Long-sleeve shirt			X	X	X (Note 9)	X
b. Pants			X (Note 4)	X (Note 6)	X (Note 9)	X
c. Coverall			(Note 5)	(Note 7)	X (Note 9)	(Note 5)
d. Jacket, parka, or rainwear			AN	AN	AN	AN
FR Protective Equipment	---	---	---	---	---	---
a. Flash suit jacket (2-layer)						X
b. Flash suit pants (2-layer)						X
Head protection	---	---	---	---	---	---
a. Hard hat			X	X	X	X
b. FR hard hat liner					X	X
Eye protection	---	---	---	---	---	---
a. Safety glasses	X	X	X	AL	AL	AL
b. Safety goggles				AL	AL	AL
Face protection double-layer switching hood				AR (Note 8)	X	X
Hearing protection (ear canal inserts)				AR (Note 8)	X	X
Leather gloves (Note 2)			AN	X	X	X
Leather work shoes			AN	X	X	X

Legend:
AN = As needed
AL = Select one in group
AR = As required
X = Minimum required

Notes:
1. See Table III (ATPV Arc Thermal Performance Exposure Value for a garment in cal/cm^2)
2. If voltage-rated gloves are required, the leather protectors worn external to the rubber gloves satisfies this requirement.
3. Class 1 is only defined if determined by Notes 3 or 6 of Table II.
4. Regular weight (minimum 12 oz/yd^2 fabric weight), untreated, denim cotton blue jeans are acceptable in lieu of FR pants. The FR pants used for Hazard/Risk Category 1 shall have a minimum ATPV of 5.
5. Alternated is to use FR coveralls (minimum ATPV of 5) over untreated natural fiber pants and T-shirt.
6. If the FR pants have a minimum ATPV of 8, long pants of untreated natural fiber are not required beneath the FR pants.
7. Alternate is to use FR coveralls (minimum ATPV of 5) over untreated natural fiber pants and T-shirt.
8. A double-layer switching hood and hearing protection are required for the tasks designated 2* in Table II.
9. Alternate is to use two sets of FR coveralls (each with a minimum ATPV of 5) over untreated natural fiber clothing, instead of FR coveralls over FR shirt and FR pants over untreated natural fiber clothing.

alone or be integrated with normal apparel. It shall cover associated parts of the body and all normal apparel that is not flash-flame resistant, while allowing movement and visibility. All PPE shall be maintained in a sanitary and reliable condition. Individual protection items will normally be used in conjunction with one another as a system to provide appropriate protection.

(c) Layering. FR and natural fiber garments shall be permitted to be used for a layered system for added protection. A typical layering system may include an

undershirt, a shirt and trouser and coverall. Specific tasks may call for specific protection systems.

Table IV: Protective Clothing Characteristics

	Typical Protective Clothing Systems		
Hazard Risk Category	Clothing Description (Number of clothing layers is given in Parentheses)	Total Weight oz/yd^2	Minimum Arc Thermal Performance Exposure Value (ATPV)* or Breakopen Threshold Energy (E_{BT})* Rating of PPE cal/cm^2
0	Untreated cotton (1)	4.5 – 7	N/A
1	FR shirt and FR pants (1)	4.5 – 8	5
2	Cotton underwear plus FR shirt and FR pants (2)	9 – 12	8
3	Cotton underwear plus FR shirt and FR pants plus FR coverall (3)	16 – 20	25
4	Cotton underwear plus FR shirt and FR pants plus double layer switching coat and pants (4)	24 – 30	40

*ATPV is defined in the ASTM P S58 standard arc test method for flame resistant (FR) fabrics as the incident energy that would just cause the onset of a second degree burn (1.2 cal/cm^2). E_{BT} is reported according to ASTM P S58 and is defined as the highest incident energy which did not cause FR fabric breakopen and did not exceed the second-degree burn criteria. E_{BT} is reported when ATPV cannot be measured due to FR fabric breakopen.

(d) Outer Layers. Garments worn as outer layers over FR clothing, such as jackets or rainwear, shall also be made from FR material.

(e) Underlayers. Meltable synthetic fibers shall be avoided in fabric underlayers next to the skin. Garments worn as underlayers (underwear) that neither ignite nor melt and drip in the course of an exposure to the electric arc and related thermal hazard may provide additional thermal protection.

(f) Coverage. Clothing shall cover potentially exposed areas as completely as possible.

(g) Fit. Tight-fitting clothing shall be avoided. Loose fitting clothing provides additional thermal insulation due to air spaces. FR apparel shall fit properly such that it does not interfere with the work task.

(h) Interference. The garment selected shall result in the least interference with the task, but still provide the necessary protection. The work method, location, and task may influence the protective equipment selected.

(3) Arc Flash Protective Equipment.

(a) Flash suits. Flash suits and their closure design shall permit easy and rapid removal. The entire flash suit, including the window, shall have energy absorbing characteristics that are suitable for the arc-flash exposure.

(b) Face Protection. Face shields made of polycarbonate material are more appropriate for use in situations with relatively low radiation exposure. Safety glasses

and goggles provide lesser protection, but in low risk tasks they may be justified if the task involves substantial physical work in combination with good visual requirements. Eye protection (safety glasses or goggles) shall always be worn under face shields or hoods.

(c) Hand Protection. Gloves made from layers of flame resistant material provide the highest level of hand protection. Heavy-duty leather gloves also provide good protection. Where voltage-rated gloves are used, leather protectors shall be worn over the rubber gloves. The leather protectors also provide good arc-flash protection for the hands.

(d) Foot Protection. Heavy-dirty leather work shoes normally provide a significant degree of protection to the feet. They are recommended for all task and shall be used for incident energy exposure levels 5 cal/cm^2, and higher (Hazard/Risk Category 2, and higher).

(4) Care and Maintenance of FR Clothing and FR Flash Suits.

(a) Inspection. FR apparel shall be inspected before each use. Work clothing or flash suits that are contaminated, greasy, worn, or damaged to the extent their protective qualities are impaired, shall be cleaned, repaired or replaced. Protective items that become soiled with grease or flammable liquids shall be removed from service and cleaned.

(b) Manufacturer's Instructions. The garment manufacturer's instructions for care and maintenance of FR apparel shall be followed.

(c) Clothing Material Characteristics.

1 Melting. Synthetic materials, such as polyester, nylon, and synthetic-cotton blends shall not be used. These materials will melt into the skin when exposed to high temperatures and aggravate the burn injury.

2 Flammability. Cotton and polyester-cotton, silk, wool, and nylon fabrics are flammable. Flame-retardant treated cotton, meta-aramid, para-aramid, and PBI fabrics may ignite but will not continue to burn after the ignition source is removed. Clothing made from natural materials, such as cotton, wool, or silk shall be considered acceptable if it is determined by flash hazard analysis that the fabric will not ignite and continue to burn under the arc conditions to which it will be exposed.

3 Clothing Not Permitted. Clothing made from synthetic materials such as acetate, nylon, polyester, rayon, either alone or in blends with cotton, shall not be worn.

11. **Other Protective Equipment**.

a. Insulated Tools.

(1) Qualifications for Insulated Tools.

(a) Insulated tools shall be rated for the voltages on which they are used.

(b) Insulated tools shall be designed and constructed for the environment to which they are exposed and the manner in which they are used.

(2) Fiberglass-Reinforced Plastic Rods. Fiberglass-reinforced plastic rod and tube used for live line tools shall meet the requirements of ASTM F 711.

b. Temporary Protective Grounding Equipment.

(1) Temporary protective grounds shall be placed at such locations and arranged in such a manner as to prevent each employee from being exposed to hazardous differences in electrical potential.

(2) Temporary protective grounds shall be capable of conducting the maximum fault current that could flow at the point of grounding for the time necessary to clear the fault.

(3) Temporary protective grounding equipment shall meet the requirements of ASTM F 855.

(4) Temporary protective grounds shall have an impedance low enough to cause immediate operation of protective devices in case of accidental energizing of the electric conductors or circuit parts.

c. Nonconductive ladders shall meet the requirements of ANSI standards for ladders given in Table V.

d. Voltage Rated Plastic Guard Equipment. Plastic guard equipment for protection of employees from accidental contact with live parts, or to protect the employee or energized equipment or material from contact with ground, shall meet the requirements of the ASTM standards given in Table V.

e. Physical or mechanical (field fabricated) barriers shall be installed no closer than the restricted approach distance given in Table V.

f. Safety signs, safety symbols, or accident prevention tags shall be used where it is necessary to warn employees about electrical hazards that might be endanger them. Such signs and tags shall meet the requirements of ANSI standard Table V.

g. Barricades shall be used in conjunction with safety signs where it is necessary to prevent or limit employee access to work areas containing live parts. Conductive barricades shall not be used where it might cause an electrical hazard. Barricades shall be placed no closer than the limited approach boundary given in Table I.

h. Alternate Alerting Techniques – Attendants. If signs and barricades do not provide sufficient warning and protection from electrical hazard, an attendant shall be stationed to warn and protect employees. The primary duty and responsibility of an attendant providing manual signaling and alerting shall be to keep unqualified employees outside a work area where the unqualified employee might be exposed to electrical hazards. An attendant shall remain in the area as long as there is a potential for employees to be exposed to the electrical hazards.

i. Test Instruments and Equipment.

(1) Test instruments, equipment, and their accessories shall be rated for circuits and equipment to which they will be connected.

(2) Test instruments, equipment, and their accessories shall be designed for the environment to which they will be exposed, and for the manner in which they will be used.

(3) Standards for Other Protective Equipment. Other protective equipment required in this section shall conform to the standards given in Table V.

12. **Use of Specific Safety-Related Equipment and Work Practices.**

a. Test Instruments and Equipment Use. Only qualified persons shall perform testing work on or near live parts operating at 50 volts or more.

b. Visual Inspection. Test instruments and equipment and all associated test leads, cables, power cords, probes, and connectors shall be visually inspected for external defects and damage before the equipment is used on any shift. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item shall be removed from service, and no employee shall use it until repairs and tests necessary to render the equipment safe have been made.

c. Energizing and Deenergizing Electrical Power Circuits.

(1) Routine Opening and Closing of Circuits. Load-rated switches, circuit breakers, or other devices specifically designed as disconnecting means shall be used for the opening, reversing, or closing of circuits under load conditions. Cable connectors not of the load-break type, fuses, terminal lugs, and cable splice connections shall not be permitted to be used for such purposes, except in an emergency.

Table V: Standards on Other Protective Equipment

Subject	Number and Title
Ladders	ANSI A14.1, *Safety Requirements for Portable Wood Ladders,* 1994
	ANSI A14.3, *Safety Requirements for Fixed Ladders,* 1984
	ANSI A14.4, *Safety Requirements for Job-Made Ladders,* 1992
	ANSI A14.5, *Safety Requirements for Portable Reinforced Plastic Ladders,* 1992
Safety signs and tags	ANSI Z535, *Series of Standards for Safety Signs and Tags,* 1998
Blankets	ASTM D 1048, *Standard Specification for Rubber Insulating Blankets,* 1998
Covers	ASTM D 1049, *Standard Specification for Rubber Covers,* 1998
Line hoses	ASTM D 1050, *Standard Specification for Rubber Insulating Line Hoses,* 1990
Line hoses and hovers	ASTM F 478, *Standard Specification for In-Service Care of Insulating Line Hose and Covers,* 1992
Blankets	ASTM F 479, *Standard Specification for In-Service Care of Insulating Blankets,* 1995
Fiberglass tools/ladders	ASTM F711, *Standard Specification for Fiberglass-Reinforced Plastic (FRP) Rod and Tube Used; in Line Tools,* 1989 (R 1997)
Plastic guards	ASTM F 712, *Standard Test Methods for Electrically Insulating Plastic Guard Equipment for Protection of Workers,* 1988 (R 1995)
Temporary grounding	ASTM F 855, *Standard Specification for Temporary Protective Grounds to Be Used on De-energized Electric Power Lines and Equipment,* 1997
Insulated hand tools	ASTM F 1505, *Standard Specification for Insulated and Insulating Hand Tools,* 1994

ASTM – American Society for Testing and Materials
ANSI – American National Standards Institute

(2) Reclosing Circuits after Protective Device Operation. After a circuit is energized by a circuit protective device, the circuit shall not be manually reenergized until it has been determined that the equipment and circuit can be safely energized. The repetitive manual reclosing of circuit breakers or reenergizing circuits through replaced fuses is prohibited. When it is determined from the design of the circuit and the overcorrect devices involved that the automatic operation of a device was caused by an overload rather than a fault condition, examination of the circuit or connected equipment shall not be required before the circuit is reenergized.

d. Portable Electric Equipment. This section applies to the use of cord- and plug-connected equipment, including cord sets (extension cords).

(1) Handling. Portable equipment shall be handled in a manner that will not cause damage. Flexible electric cords connected to equipment shall not be used for raising or lowering the equipment. Flexible cords shall not be fastened with staples or hung in such a fashion as could damage the outer jacket or insulation.

(2) Grounding-type Equipment.

(a) A flexible cord used with grounding-type utilization equipment shall contain an equipment grounding conductor.

(b) Attachment plugs and receptacles shall not be connected or altered in a manner that would interrupt continuity of the equipment grounding conductor at the point where plugs are attached to receptacles. Additionally, these devices shall not be altered to allow the grounding pole of a plug to be inserted into slots intended for connection to the current-carrying conductors.

(c) Adapters that interrupt the continuity of the equipment grounding conductor shall not be used.

(3) Visual Inspection of Portable Cord- and Plug-Connected Equipment and Flexible Cord Sets.

(a) Frequency of Inspection. Before use on any shift, portable cord- and plug-connected equipment shall be visually inspected for external defects (such as loose parts, deformed and missing pins) and for evidence of possible internal damage (such as pinched or crushed outer jacket). An exception is that cord- and plug-connected equipment and flexible cord sets (extension cords) that remain connected once they are put in place and are not exposed to damage shall not be required to visually inspected until they are relocated.

(b) Defective Equipment. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item shall be removed from service, and no employee shall use it until repairs and tests necessary to render the equipment safe have been made.

(c) Proper Mating. When an attachment plug is to be connected to a receptacle, the relationship of the plug and receptacle contacts shall first be checked to ensure that they are of mating configurations.

(4) Conductive Work Locations. Portable electric equipment used in highly conductive work locations (such as those inundated with water or other liquids) or in job locations where employees are likely to contact water or conductive liquids shall be approved for those locations. In job locations where employees are likely to contact or be drenched with water or conductive liquids, ground-fault circuit-interrupter protection for personnel shall also be followed.

(5) Connecting Attachment Plugs.

(a) Employees hands shall not be wet when plugging and unplugging flexible cords and cord- and plug-equipment, if energized equipment is involved.

(b) Energized plug and receptacle connection shall be handled only with insulating protective equipment if the condition of the connection provides a conductive path to the employee's hand.

(c) Locking-type connectors shall be installed after connection.

13. **Administration and Enforcement**. See paragraph 12 of basic document (Occupational Safety and Health Program Act).

Legislative History:

1/9/02	Legislature posts for 45-day Public Review.
5/20/02	Enacted as Electrical Safety (6 HCC § 8-4) by Legislative Resolution 5/20/02E.