(c) Face Protection. Face shields shall have an arc rating suitable for the arc flash exposure. Face shields with a wrap-around guarding to protect the face, chin, forehead, ears, and neck area shall be used. Face shields without an arc rating shall not be used. Eye protection (safety glasses or goggles) shall always be worn under face shields or hoods.

Informational Note: Face shields made with energy-absorbing formulations that can provide higher levels of protection from the radiant energy of an arc flash are available, but these shields are tinted and can reduce visual acuity and color perception. Additional illumination of the task area might be necessary when these types of arc-protective face shields are used.

(d) Hand Protection.

(1) Heavy-duty leather gloves or arc-rated gloves shall be worn where required for arc flash protection.

Informational Note: Heavy-duty leather gloves are made entirely of leather with minimum thickness of 0.03 in. (0.7 mm) and are unlined or lined with nonflammable, nonmelting fabrics. Heavy-duty leather gloves meeting this requirement have been shown to have ATPV values in excess of 10 cal/cm^2.

(2) Where insulating rubber gloves are used for shock protection, leather protectors shall be worn over the rubber gloves.

Informational Note: The leather protectors worn over rubber insulating gloves provide additional arc flash protection for the hands for arc flash protection exposure.

(e) Foot Protection. Heavy-duty leather footwear provide some arc flash protection to the feet and shall be used in all exposures greater than 4 cal/cm^2.

(11) Clothing Material Characteristics. Arc-rated clothing shall meet the requirements described in 130.7(C)(14) and 130.7(C)(12).

Informational Note No. 1: Arc-rated materials, such as flame-retardant-treated cotton, meta-aramid, para-aramid, and poly-benzimidazole (PBI) fibers, provide thermal protection. These materials can ignite but will not continue to burn after the ignition source is removed. Arc-rated fabrics can reduce burn injuries during an arc flash exposure by providing a thermal barrier between the arc flash and the wearer.

Informational Note No. 2: Non–arc-rated cotton, polyester-cotton blends, nylon, nylon-cotton blends, silk, rayon, and wool fabrics are flammable. Fabrics, zipper tapes, and findings made of these materials can ignite and continue to burn on the body, resulting in serious burn injuries.

Informational Note No. 3: Rayon is a cellulose-based (wood pulp) synthetic fiber that is a flammable but nonmelting material.

Clothing consisting of fabrics, zipper tapes, and findings made from flammable synthetic materials that melt at temperatures below 315°C (600°F), such as acetate, acrylic, nylon, polyester, polyethylene, polypropylene, and spandex, either alone or in blends, shall not be used.

Informational Note: These materials melt as a result of arc flash exposure conditions, form intimate contact with the skin, and aggravate the burn injury.

Exception: Fiber blends that contain materials that melt, such as acetate, acrylic, nylon, polyester, polyethylene, polypropylene, and spandex, shall be permitted if such blends in fabrics meet the requirements of ASTM F1506, Standard Performance Specification for Flame Resistant and Arc Rated Textile Materials for Wearing Apparel for Use by Electrical Workers Exposed to Momentary Electric Arc and Related Thermal Hazards, and if such blends in fabrics do not exhibit evidence of a melting and sticking hazard during arc testing according to ASTM F1959/F1959M, Standard Test Method for Determining the Arc Rating of Materials for Clothing.

(12) Clothing and Other Apparel Not Permitted. Clothing and other apparel (such as hard hat liners and hair nets) made from materials that do not meet the requirements of 130.7(C)(11) regarding melting or made from materials that do not meet the flammability requirements shall not be permitted to be worn.

Informational Note: Some flame-resistant fabrics, such as non-flame-resistant modacrylic and nondurable flame-retardant treatments of cotton, are not recommended for industrial electrical or utility applications.

Exception No. 1: Nonmelting, flammable (non–arc-rated) materials shall be permitted to be used as underlayers to arc-rated clothing, as described in 130.7(C)(11).

Exception No. 2: Where the work to be performed inside the arc flash boundary exposes the worker to multiple hazards, such as airborne contaminants, and the risk assessment identifies that the level of protection is adequate to address the arc flash hazard, non–arc-rated PPE shall be permitted.

(13) Care and Maintenance of Arc-Rated Clothing and Arc-Rated Arc Flash Suits.

(a) Inspection. Arc-rated apparel shall be inspected before each use. Work clothing or arc flash suits that are contaminated or damaged to the extent that their protective qualities are impaired shall not be used. Protective items that become contaminated with grease, oil, or flammable liquids or combustible materials shall not be used.

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

(c) Storage. Arc-rated apparel shall be stored in a manner that prevents physical damage; damage from moisture, dust, or other deteriorating agents; or contamination from flammable or combustible materials.

(d) Cleaning, Repairing, and Affixing Items. When arc-rated clothing is cleaned, manufacturer's instructions shall be followed to avoid loss of protection. When arc-rated clothing is repaired, the same arc-rated materials used to manufacture the arc-rated clothing shall be used to provide repairs.

Informational Note No. 1: Additional guidance is provided in ASTM F1506, *Standard Performance Specification for Flame Resistant and Arc Rated Textile Materials for Wearing Apparel for Use by Electrical Workers Exposed to Momentary Electric Arc and Related Thermal Hazards*, when trim, name tags, logos, or any combination thereof are affixed to arc-rated clothing.

Informational Note No. 2: Additional guidance is provided in ASTM F1449, *Standard Guide for Industrial Laundering of Flame, Thermal, and Arc Resistant Clothing*, and ASTM F2757, *Standard Guide for Home Laundering Care and Maintenance of Flame, Thermal, and Arc Resistant Clothing*.

(14) Standards for Personal Protective Equipment (PPE). PPE shall conform to the standards listed in Table 130.7(C)(14).

Informational Note: Non–arc-rated or flammable fabrics are not covered by any of the standards in Table 130.7(C)(14). See 130.7(C)(11) and 130.7(C)(12).

(15) Selection of Personal Protective Equipment (PPE) When Required for Various Tasks.

(A) Alternating Current (ac) Equipment. When selected in lieu of the incident energy analysis of 130.5(B)(1), Table 130.7(C)(15)(A)(a) shall be used to identify when arc flash PPE is required. When arc flash PPE is required, Table 130.7(C)(15)(A)(b) shall be used to determine the arc flash PPE category. The estimated maximum available short-circuit current, maximum fault-clearing times, and minimum working distances for various ac equipment types or classifications are listed in Table 130.7(C)(15)(A)(b). An incident energy analysis shall be required in accordance with 130.5 for the following:

(1) Tasks not listed in Table 130.7(C)(15)(A)(a)
(2) Power systems with greater than the estimated maximum available short-circuit current
(3) Power systems with longer than the maximum fault clearing times
(4) Tasks with less than the minimum working distance

(B) Direct Current (dc) Equipment. When selected in lieu of the incident energy analysis of 130.5(C)(1), Table 130.7(C)(15)(A)(a) shall be used to identify when arc flash PPE is required. When arc flash PPE is required, Table 130.7(C)(15)(B) shall be used to determine the arc flash PPE category. The estimated maximum available short circuit current, maximum arc duration and working distances for dc equipment are listed in 130.7(C)(15)(B). An incident energy analysis shall be required in accordance with 130.5 for the following:

(1) Tasks not listed in Table 130.7(C)(15)(A)(a)
(2) Power systems with greater than the estimated maximum available short circuit current
(3) Power systems with longer than the maximum fault clearing times
(4) Tasks with less than the minimum working distance

Informational Note No. 1: The arc flash PPE category, work tasks, and protective equipment provided in Table 130.7(C)(15)(A)(a), Table 130.7(C)(15)(A)(b), and Table 130.7(C)(15)(B) were identified and selected, based on the collective experience of the NFPA 70E Technical Committee. The arc flash PPE category of the protective clothing and equipment is generally based on determination of the estimated exposure level.

Informational Note No. 2: The collective experience of the NFPA 70E Technical Committee is that, in most cases, closed doors do not provide enough protection to eliminate the need for PPE in situations in which the state of the equipment is known to readily change (e.g., doors open or closed, rack in or rack out).

Informational Note No. 3: The premise used by the NFPA 70E Technical Committee in developing the criteria discussed in Informational Note No. 1 and Informational Note No. 2 is considered to be reasonable, based on the consensus judgment of the committee.

(16) Protective Clothing and Personal Protective Equipment (PPE). Once the arc flash PPE category has been identified from Table 130.7(C)(15)(A)(b) or Table 130.7(C)(15)(B), Table 130.7(C)(16) shall be used to determine the required PPE for the task. Table 130.7(C)(16) lists the requirements for PPE based on arc flash PPE categories 1 through 4. This clothing and equipment shall be used when working within the arc flash boundary.

Informational Note No. 1: See Informative Annex H for a suggested simplified approach to ensure adequate PPE for electrical workers within facilities with large and diverse electrical systems.

Informational Note No. 2: The PPE requirements of this section are intended to protect a person from arc flash hazards. While some situations could result in burns to the skin, even with the protection described in Table 130.7(C)(16), burn injury should be reduced and survivable. Due to the explosive effect of some arc events, physical trauma injuries could occur. The PPE requirements of this section do not address protection against physical trauma other than exposure to the thermal effects of an arc flash.

Informational Note No. 3: The arc rating for a particular clothing system can be obtained from the arc-rated clothing manufacturer.

Table 130.7(C)(15)(A)(a) Arc Flash Hazard Identification for Alternating Current (ac) and Direct Current (dc) Systems

Task	Equipment Condition*	Arc Flash PPE Required
Reading a panel meter while operating a meter switch	Any	No
Normal operation of a circuit breaker (CB), switch, contactor, or starter	All of the following: The equipment is properly installed The equipment is properly maintained All equipment doors are closed and secured All equipment covers are in place and secured There is no evidence of impending failure	No
	One or more of the following: The equipment is not properly installed The equipment is not properly maintained Equipment doors are open or not secured Equipment covers are off or not secured There is evidence of impending failure	Yes
For ac systems: Work on energized electrical conductors and circuit parts, including voltage testing	Any	Yes
For dc systems: Work on energized electrical conductors and circuit parts of series-connected battery cells, including voltage testing	Any	Yes
Voltage testing on individual battery cells or individual multi-cell units	All of the following: The equipment is properly installed The equipment is properly maintained Covers for all other equipment are in place and secured There is no evidence of impending failure	No
	One or more of the following: The equipment is not properly installed The equipment is not properly maintained Equipment doors are open or not secured Equipment covers are off or not secured There is evidence of impending failure	Yes
Removal or installation of CBs or switches	Any	Yes
Removal or installation of covers for equipment such as wireways, junction boxes, and cable trays that does not expose bare energized electrical conductors and circuit parts	All of the following: The equipment is properly installed The equipment is properly maintained There is no evidence of impending failure	No
	Any of the following: The equipment is not properly installed The equipment is not properly maintained There is evidence of impending failure	Yes
Removal of bolted covers (to expose bare energized electrical conductors and circuit parts). For dc systems, this includes bolted covers, such as battery terminal covers.	Any	Yes

(continues)

Table 130.7(C)(15)(A)(a) *Continued*

Task	Equipment Condition*	Arc Flash PPE Required
Removal of battery intercell connector covers	All of the following: The equipment is properly installed. The equipment is properly maintained Covers for all other equipment are in place and secured There is no evidence of impending failure	No
	One or more of the following: The equipment is not properly installed The equipment is not properly maintained Equipment doors are open or not secured Equipment covers are off or not secured There is evidence of impending failure	Yes
Opening hinged door(s) or cover(s) (to expose bare energized electrical conductors and circuit parts)	Any	Yes
Perform infrared thermography and other noncontact inspections outside the restricted approach boundary. This activity does not include opening of doors or covers.	Any	No
Application of temporary protective grounding equipment after voltage test	Any	Yes
Work on control circuits with exposed energized electrical conductors and circuit parts, 120 volts or below without any other exposed energized equipment over 120 V including opening of hinged covers to gain access	Any	No
Work on control circuits with exposed energized electrical conductors and circuit parts, greater than 120 V	Any	Yes
Insertion or removal of individual starter buckets from motor control center (MCC)	Any	Yes
Insertion or removal (racking) of CBs or starters from cubicles, doors open or closed	Any	Yes
Insertion or removal of plug-in devices into or from busways	Any	Yes
Insulated cable examination with no manipulation of cable	Any	No
Insulated cable examination with manipulation of cable	Any	Yes
Work on exposed energized electrical conductors and circuit parts of equipment directly supplied by a panelboard or motor control center	Any	Yes
Insertion and removal of revenue meters (kW-hour, at primary voltage and current)	Any	Yes
For dc systems, insertion or removal of individual cells or multi-cell units of a battery system in an enclosure	Any	Yes
For dc systems, insertion or removal of individual cells or multi-cell units of a battery system in an open rack	Any	No

Table 130.7(C)(15)(A)(a) *Continued*

Task	Equipment Condition*	Arc Flash PPE Required
For dc systems, maintenance on a single cell of a battery system or multi-cell units in an open rack	Any	No
For dc systems, work on exposed energized electrical conductors and circuit parts of utilization equipment directly supplied by a dc source	Any	Yes
Arc-resistant switchgear Type 1 or 2 (for clearing times of <0.5 sec with a prospective fault current not to exceed the arc-resistant rating of the equipment) and metal enclosed interrupter switchgear, fused or unfused of arc resistant type construction, tested in accordance with IEEE C37.20.7:	All of the following:	
•Insertion or removal (racking) of CBs from cubicles •Insertion or removal (racking) of ground and test device •Insertion or removal (racking) of voltage transformers on or off the bus	The equipment is properly installed The equipment is properly maintained All equipment doors are closed and secured All equipment covers are in place and secured There is no evidence of impending failure	No
	One or more of the following: The equipment is not properly installed The equipment is not properly maintained Equipment doors are open or not secured Equipment covers are off or not secured There is evidence of impending failure	Yes
Opening voltage transformer or control power transformer compartments	Any	Yes
Outdoor disconnect switch operation (hookstick operated) at 1 kV through 15 kV	Any	Yes
Outdoor disconnect switch operation (gang-operated, from grade) at 1 kV through 15 kV	Any	Yes

Note: Hazard identification is one component of risk assessment. Risk assessment involves a determination of the likelihood of occurrence of an incident, resulting from a hazard that could cause injury or damage to health. The assessment of the likelihood of occurrence contained in this table does not cover every possible condition or situation. Where this table indicates that arc flash PPE is not required, an arc flash is not likely to occur.

*The phrase *properly installed*, as used in this table, means that the equipment is installed in accordance with applicable industry codes and standards and the manufacturer's recommendations. The phrase *properly maintained*, as used in this table, means that the equipment has been maintained in accordance with the manufacturer's recommendations and applicable industry codes and standards. The phrase *evidence of impending failure*, as used in this table, means that there is evidence of arcing, overheating, loose or bound equipment parts, visible damage, deterioration, or other damage.

Table 130.7(C)(15)(A)(b) Arc-Flash Hazard PPE Categories for Alternating Current (ac) Systems

Equipment	Arc Flash PPE Category	Arc-Flash Boundary
Panelboards or other equipment rated 240 V and below Parameters: Maximum of 25 kA short-circuit current available; maximum of 0.03 sec (2 cycles) fault clearing time; working distance 455 mm (18 in.)	1	485 mm (19 in.)
Panelboards or other equipment rated >240 V and up to 600 V Parameters: Maximum of 25 kA short-circuit current available; maximum of 0.03 sec (2 cycles) fault clearing time; working distance 455 mm (18 in.)	2	900 mm (3 ft)
600-V class motor control centers (MCCs) Parameters: Maximum of 65 kA short-circuit current available; maximum of 0.03 sec (2 cycles) fault clearing time; working distance 455 mm (18 in.)	2	1.5 m (5 ft)
600-V class motor control centers (MCCs) Parameters: Maximum of 42 kA short-circuit current available; maximum of 0.33 sec (20 cycles) fault clearing time; working distance 455 mm (18 in.)	4	4.3 m (14 ft)
600-V class switchgear (with power circuit breakers or fused switches) and 600 V class switchboards Parameters: Maximum of 35 kA short-circuit current available; maximum of up to 0.5 sec (30 cycles) fault clearing time; working distance 455 mm (18 in.)	4	6 m (20 ft)
Other 600-V class (277 V through 600 V, nominal) equipment Parameters: Maximum of 65 kA short circuit current available; maximum of 0.03 sec (2 cycles) fault clearing time; working distance 455 mm (18 in.)	2	1.5 m (5 ft)
NEMA E2 (fused contactor) motor starters, 2.3 kV through 7.2 kV Parameters: Maximum of 35 kA short-circuit current available; maximum of up to 0.24 sec (15 cycles) fault clearing time; working distance 910 mm (36 in.)	4	12 m (40 ft)
Metal-clad switchgear, 1 kV through 15 kV Parameters: Maximum of 35 kA short-circuit current available; maximum of up to 0.24 sec (15 cycles) fault clearing time; working distance 910 mm (36 in.)	4	12 m (40 ft)
Arc-resistant switchgear Type 1 or 2 [for clearing times of < 0.5 sec (30 cycles) with a perspective fault current not to exceed the arc-resistant rating of the equipment], and metal-enclosed interrupter switchgear, fused or unfused of arc-resistant-type construction, tested in accordance with IEEE C37.20.7, 1 kV through 15 kV	N/A (doors closed)	N/A (doors closed)
Parameters: Maximum of 35 kA short-circuit current available; maximum of up to 0.24 sec (15 cycles) fault clearing time; working distance 910 mm (36 in.)	4 (doors open)	12 m (40 ft)
Other equipment 1 kV through 15 kV Parameters: Maximum of 35 kA short-circuit current available; maximum of up to 0.24 sec (15 cycles) fault clearing time; working distance 910 mm (36 in.)	4	12 m (40 ft)

Note: For equipment rated 600 volts and below, and protected by upstream current-limiting fuses or current-limiting circuit breakers sized at 200 amperes or less, the arc flash PPE category can be reduced by one number but not below arc flash PPE category 1.

Table 130.7(C)(15)(B) Arc-Flash Hazard PPE Categories for Direct Current (dc) Systems

Equipment	Arc Flash PPE Category	Arc-Flash Boundary
Storage batteries, dc switchboards, and other dc supply sources 100 V > Voltage < 250 V Parameters: Voltage: 250 V Maximum arc duration and working distance: 2 sec @ 455 mm (18 in.)		
Short-circuit current < 4 kA	1	900 mm (3 ft)
4 kA ≤ short-circuit current < 7 kA	2	1.2 m (4 ft)
7 kA ≤ short-circuit current < 15 kA	3	1.8 m (6 ft)
Storage batteries, dc switchboards, and other dc supply sources 250 V ≤ Voltage ≤ 600 V Parameters: Voltage: 600 V Maximum arc duration and working distance: 2 sec @ 455 mm (18 in.)		
Short-circuit current <1.5 kA	1	900 mm (3 ft)
1.5 kA ≤ short-circuit current < 3 kA	2	1.2 m (4 ft)
3 kA ≤ short-circuit current < 7 kA	3	1.8 m (6 ft.)
7 kA ≤ short-circuit current < 10 kA	4	2.5 m (8 ft)

Note: Apparel that can be expected to be exposed to electrolyte must meet both of the following conditions:
(1) Be evaluated for electrolyte protection in accordance with ASTM F1296, *Standard Guide for Evaluating Chemical Protective Clothing*
(2) Be arc-rated in accordance with ASTM F1891, *Standard Specification for Arc Rated and Flame Resistant Rainwear*, or equivalent.

Informational Note No. 1: "Short-circuit current," as used in this table, is determined from the dc power system maximum available short-circuit, including the effects of cables and any other impedances in the circuit. Power system modeling is the best method to determine the available short-circuit current at the point of the arc. Battery cell short-circuit current can be obtained from the battery manufacturer. See Informative Annex D.5 for the basis for table values and alternative methods to determine dc incident energy. Methods should be used with good engineering judgment.

Informational Note No. 2: The methods for estimating the dc arc flash incident energy that were used to determine the categories for this table are based on open-air incident energy calculations. Open-air calculations were used because many battery systems and other dc process systems are in open areas or rooms. If the specific task is within in an enclosure, it would be prudent to consider additional PPE protection beyond the value shown in this table. Research with ac arc flash has shown a multiplier of as much as 3x for arc-in-a-box [508 mm (20 in.) cube] versus open air. Engineering judgment is required when reviewing the specific conditions of the equipment and task to be performed, including the dimensions of the enclosure and the working distance involved.

Table 130.7(C)(16) Personal Protective Equipment (PPE)

PPE Category	PPE
1	**Arc-Rated Clothing, Minimum Arc Rating of 4 cal/cm^2** (see Note 1) Arc-rated long-sleeve shirt and pants or arc-rated coverall Arc-rated face shield (see Note 2) or arc flash suit hood Arc-rated jacket, parka, rainwear, or hard hat liner (AN) **Protective Equipment** Hard hat Safety glasses or safety goggles (SR) Hearing protection (ear canal inserts) Heavy duty leather gloves (see Note 3) Leather footwear (AN)
2	**Arc-Rated Clothing, Minimum Arc Rating of 8 cal/cm^2** (see Note 1) Arc-rated long-sleeve shirt and pants or arc-rated coverall Arc-rated flash suit hood or arc-rated face shield (see Note 2) and arc-rated balaclava Arc-rated jacket, parka, rainwear, or hard hat liner (AN) **Protective Equipment** Hard hat Safety glasses or safety goggles (SR) Hearing protection (ear canal inserts) Heavy duty leather gloves (see Note 3) Leather footwear
3	**Arc-Rated Clothing Selected so That the System Arc Rating Meets the Required Minimum Arc Rating of 25 cal/cm^2** (see Note 1) Arc-rated long-sleeve shirt (AR) Arc-rated pants (AR) Arc-rated coverall (AR) Arc-rated arc flash suit jacket (AR) Arc-rated arc flash suit pants (AR) Arc-rated arc flash suit hood Arc-rated gloves (see Note 3) Arc-rated jacket, parka, rainwear, or hard hat liner (AN) **Protective Equipment** Hard hat Safety glasses or safety goggles (SR) Hearing protection (ear canal inserts) Leather footwear
4	**Arc-Rated Clothing Selected so That the System Arc Rating Meets the Required Minimum Arc Rating of 40 cal/cm^2** (see Note 1) Arc-rated long-sleeve shirt (AR) Arc-rated pants (AR) Arc-rated coverall (AR) Arc-rated arc flash suit jacket (AR) Arc-rated arc flash suit pants (AR) Arc-rated arc flash suit hood Arc-rated gloves (see Note 3) Arc-rated jacket, parka, rainwear, or hard hat liner (AN) **Protective Equipment** Hard hat Safety glasses or safety goggles (SR) Hearing protection (ear canal inserts) Leather footwear

AN: as needed (optional). AR: as required. SR: selection required.
Notes:
(1) *Arc rating* is defined in Article 100.
(2) Face shields are to have wrap-around guarding to protect not only the face but also the forehead, ears, and neck, or, alternatively, an arc-rated arc flash suit hood is required to be worn.
(3) If rubber insulating gloves with leather protectors are used, additional leather or arc-rated gloves are not required. The combination of rubber insulating gloves with leather protectors satisfies the arc flash protection requirement.

(D) Other Protective Equipment.

(1) Insulated Tools and Equipment. Employees shall use insulated tools or handling equipment, or both, when working inside the restricted approach boundary of exposed energized electrical conductors or circuit parts where tools or handling equipment might make accidental contact. Insulated tools shall be protected from damage to the insulating material.

Informational Note: See 130.4(B), Shock Protection Boundaries.

(a) Requirements for Insulated Tools. The following requirements shall apply to insulated tools:

(1) Insulated tools shall be rated for the voltages on which they are used.
(2) Insulated tools shall be designed and constructed for the environment to which they are exposed and the manner in which they are used.
(3) Insulated tools and equipment shall be inspected prior to each use. The inspection shall look for damage to the insulation or damage that can limit the tool from performing its intended function or could increase the potential for an incident (e.g., damaged tip on a screwdriver).

Attachment 5 to Directive 786

William & Mary

Arc Rated Clothing Instructions

NO WORK ON ENERGIZED EQUIPMENT, EXCEPT AS SPECIFIED BELOW

1. The routine use of a voltage tester to check energized outlets, switches or light fixtures is permitted without arc rated coveralls provided the electrical worker is wearing street clothing/uniforms made of non-melting flammable materials such as non-treated cotton. Resetting circuit breakers in enclosed non-vented panels and non-energized fuse replacement do not require PPE.

2. In addition to the established lockout/tag out (LOTO) procedures, the following tasks require the use of Category 2 PPE described as follows: arc rated coveralls over cotton t-shirt or shirt and cotton pants or cotton uniforms, insulated gloves, safety glasses, arc rated face shield w/hard hat, balaclava, hearing protection, and leather footwear:

    a. Opening hinged or bolted panel covers (to expose energized parts), 480 volts and below.
    b. Voltage testing on energized circuits 480 volts and below.

3. The following tasks shall only be performed after authorization from the Associate Vice President for Facilities Management, Van Dobson, or the Electrical Supervisor, Mike Marrs. These tasks require the use of Category 4 PPE described as follows: arc rated coveralls over cotton t-shirt or shirt and cotton pants or cotton uniforms, insulated gloves, safety glasses, hearing protection, hard hat, balaclava, leather footwear, and full arc suit:

    a. Removing bolted covers from switch gear, (to expose energized parts) 480 to 277 volts.
    b. Resetting tripped main circuit breakers in front venting switchgear 480 to 277 volts.