**Standard Operating Procedure for Voltage Testing/Verifying Absence of Power**

*This SOP is not to be utilized on the following equipment: Motor Control Centers (MCC), Metal-Clad Switchgear, and equipment over 600 volts.*

**PPE Required for equipment 240 volts and below: *CAT 1***

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| **Electrical Rated PPE**  **Arc-rated clothing, minimum ARC rating of 4 cal/cm2** | **General PPE** |
| Arc-rated long-sleeve shirt and pants OR arc-rated coveralls | Hardhat |
| Arc-rated face shield or arc-rated flash suit hood | Safety Glasses or Goggles |
| Arc-rated jacket, parka, high-visibility apparel, rainwear, or hardhat liner  (As needed) | Hearing Protection (ear canal inserts) |
| Rubber insulating gloves WITH leather gloves (Class 00) | ASTM Leather Footwear (as needed if step potential exists) |

**PPE Required for equipment GREATER THAN 240 volts and UP TO 600 volts: *CAT 2***

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| --- | --- |
| **Electrical Rated PPE**  **Arc-rated clothing, minimum ARC rating of 8 cal/cm2** | **General PPE** |
| Arc-rated long-sleeve shirt and pants OR arc-rated coverall | Hardhat |
| Arc-rated face shield WITH arc-rated balaclava **OR** arch flash suit hood | Safety Glasses or Goggles |
| Arc-rated jacket, parka, high-visibility apparel, rainwear, or hardhat liner  (As needed) | Hearing Protection (ear canal inserts) |
| Rubber insulating gloves WITH leather gloves (Class 0) | ASTM Leather Footwear |

**Minimum tools required**

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| Multimeter |
| LOTO Supplies |
| Basic hand tools (voltage rated not required) |
| Approach Boundary Barricade (if needed-i.e. if access into the room can’t be secured) |

1. Wear proper PPE and test for potential (power) at the device. (phase-phase, phase-neutral, phase-ground)

***Note: Verify device is not being fed with two sources such as Normal AND Emergency or Normal AND night light circuits.***

* + 1. Inform nearby occupants – if applicable, (CCS if applicable-UP locations only) that you are de-energizing a circuit for troubleshooting/repairs and address any concerns prior to opening breaker (examples could be desk lamps turned on, temporary lighting offered, etc).
    2. Open breaker feeding the circuit.
    3. Apply lockout device, lock, and tag to the breaker.
       1. Test lockout device to ensure breaker cannot be turned on accidentally and that it is securely fastened to the breaker handle.
    4. Conduct a “Live-Dead-Live” test:

1. Test multimeter on a live circuit (a receptacle is fine for this) to determine if the meter is working correctly.

2. Next, test circuit being worked on to verify that it is de-energized. Testing must include phase-to-phase, phase-to-neutral and phase-to-ground.

3. Lastly, retest multimeter on the live circuit you used in step (1)(iv)(1) to ensure multimeter is still working properly.

a. If potential/energized circuit still exists: (I.E. wrong circuit breaker/disconnect was LOTO)

i. If you cannot ID the correct circuit to LOTO:

- Contact an Electrician 309-03 or higher (if at UP location) or Maintenance Department (if at Commonwealth Campus location) to assist you with finding and confirming a power source.

- Potential may come from a sensor or emergency source that may need more investigating.

- Examine wiring diagrams.

ii. Once the correct circuit/power source is confirmed, you can proceed starting at step (1) above.

4. Absence of power has now been confirmed. You may now remove your electrical PPE to complete the task.

Original – 10/2022