**Standard Operating Procedure for Replacement of Receptacles and Light Switches**

**PPE Required for receptacles and light switches 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 coverall | 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 protection (Class 00) | ASTM Leather Footwear (as needed if step potential exists) |

**PPE Required for receptacles and light switches 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. Inform nearby occupants that you are turning area receptacles and/or lights off for repairs and address any concerns prior to opening breaker (I.E. desk lamps turned on, temporary lighting offered, etc)
2. Observe receptacle/switch for damage prior to opening covers.
3. Open/de-energize breaker feeding the circuit.
4. Apply lockout device, lock, and tag to the breaker.

A. Test lockout device to ensure breaker cannot be turned on accidentally and that it is securely fastened to the breaker handle.

1. Wear proper PPE and test for potential (power) at the device. (all that apply: 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 lights circuits. In certain housing facilities, the lighting circuits begin with a four-way switch, with two separate sources supplying power.***
	* 1. Conduct a “Live-Dead-Live” test:

 1. Test multimeter on a live circuit (another receptacle, other than the one being worked on, 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 (5)(i)(1) to ensure multimeter is still working properly.

* + 1. If circuit is de-energized, you may now remove your electrical PPE to complete the task.
		2. Proceed to step 6 below.
		3. **IF CIRCUIT WAS FOUND TO NOT BE DE-ENERGIZED, PROCEED TO STEP (5)(a) below.**

a. If the circuit to be worked on was determined to still be energized after LOTO and “Live-Dead-Live” testing, this means either the wrong breaker was opened (mislabeled) and/or there is another circuit supplying electricity such as a lighting sensor or a emergency backup power supply:

1. Try turning other lights on or testing other receptacles in an attempt to ID the correct circuit to LOTO.
2. Ask tenants if there is a hidden keypad or some other location that you need to find to turn the lights on.
3. 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.

1. Once the correct circuit/power source is confirmed, you can proceed starting at step 3 above.
2. Perform tasks needed to replace the receptacle/switch.
3. Once all repairs have been made, re-install all covers. Inform nearby occupants that you are going to energize the circuit.
4. Remove lock from breaker, close breaker.
5. Monitor for normal operation.
6. Clean work area from left over debris, inform occupant that all your work is complete.

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