**Standard Operating Procedure for Changing Ballasts**

**PPE Required for lighting systems rated 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 lighting systems rated 1) GREATER THAN 240 volts and UP TO 600 volts AND/OR 2) 277- volt lighting systems: 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 lights off for repairs and address any concerns prior to opening breaker (I.E., desk lamps turned on, temporary lighting offered, etc.)
2. Observe fixture for damage/loose brackets/diffusers prior to opening covers.
3. **If a Ballast quick disconnect is present -** **open ballast quick disconnect and proceed to Step 5 below.**

IF POTENTIAL/ELECTRICITY HAZARD EXISTS (i.e. ballast quick disconnect not present):

1. Wear proper PPE and test for potential (power) at the fixture. (All that apply: phase-phase, phase-neutral, phase-ground)
	* 1. Open breaker feeding the lighting circuit.
		2. 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.
		3. 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 (4)(iii)(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.

a. If potential/electricity still exists after step (4)(iii) above: (lighting circuits are still energized. The incorrect circuit was opened/de-energized/LOTO/etc.)

1. Try turning other lights on 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) 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 4 above.
2. Perform tasks needed to repair light fixture (i.e., tombstone or ballast replacement)
	1. *If fixture doesn’t have a ballast disconnect, install one during the repair starting at step 4.*
3. Once all repairs have been made, re-install all covers, lamps, and diffusers. Inform nearby tenants that you are going to energize the lighting circuit.
4. Remove lock from breaker, close (energize) breaker.
5. Monitor light fixture for normal operation.
6. Clean work area from left over debris, inform tenant that all your work is complete.

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