What are the Shock PPE, Arc Flash PPE and documentation requirements to work on electrical equipment?
(See **OSHA Table I-4** for shock PPE and 2015 NFPA 70E for all other **references**, **definitions,** and **tables**)

Are you a **qualified person** for the task to be completed?

NO → Find a **qualified person** to complete the task and associated hazard analysis.

YES

Is this task permitted to be performed while the equipment is **energized**?

Is the **energized** electrical work to be performed part of a LO/TO procedure to put the equipment in an electrically safe condition?

NO → **Energized** electrical work is PROHIBITED.

YES

Will placing the equipment in an electrically safe condition create additional hazards or increased risk?

NO → **Energized** electrical work is PROHIBITED.

YES

Is the task to be performed infeasible in a **de-energized** state, (e.g. voltage testing)?

NO → **Energized** electrical work is PROHIBITED.

YES

Are all voltages across any **exposed, energized** conductors less than 50 volts?

NO → **Energized** electrical work is PROHIBITED.

YES

What PPE is required to mitigate the **SHOCK HAZARD?**

What is the highest voltage of any **exposed**, **energized** electrical conductor you will be exposed to while completing the task?

(1) _____Vac / Vdc (circle one) — EEWP II, 1.

See **Table 130.4(D)(a)** for AC voltages.
See **Table 130.4(D)(b)** for DC voltages.

What is the **limited approach boundary**?
What is the **restricted approach boundary**?

(2) **Limited Approach Boundary**: _____
Restricted Approach Boundary: _____
EEWP II, 4.a.
EEWP II, 4.b.

Does the task at hand require you to enter the **restricted approach boundary**, including using tools and/or probes to come into contact with electrical conductors?

NO

No shock PPE is required outside of the **restricted approach boundary.**

YES

Select and use shock PPE per **OSHA Table I-4** for all body parts that will enter the **restricted approach boundary.**

(3) Class ____ Shock PPE
EEWP II, 4.c.

The **qualified person** shall ensure that no **unqualified person** is allowed to approach the **exposed**, **energized** electrical conductor nearer than the **limited approach boundary**, unless permitted by **130.4(C)**.

Continue to next page for **ARC FLASH HAZARD.**

What PPE is required to mitigate the **ARC FLASH HAZARD?**

See **Table 130.7(C)(15)(A)(a)**. Is arc flash PPE Required?

NO → No **arc flash hazard** present. No arc flash PPE required.

YES

Has the equipment been labeled for arc flash **incident energy**?

YES

Use incident energy analysis method per **130.5(C)(1)**. Note the **arc flash boundary** provided on the label.

Note the **incident energy** provided on the label. Use **Table H.3(b)** in **Informative Annex H** to select PPE.

NO

Is the equipment rated for 480V or less AND protected by a circuit breaker rated at 20A or less?

YES

Use PPE listed in the "≤1.2 cal/cm squared" section of **Table H.3(b)** in **Informative Annex H**.

Assume an **arc flash boundary** of 18".

NO

Use arc flash PPE categories method per **130.5(C)(2).**

Use **Table 130.7(C)(15)(A)(b)** for AC equipment or **Table 130.7(C)(B)** for DC equipment. Is the arc flash PPE category 1 or 2?

YES

Use **Table 130.7(C)(16)** to determine the **arc flash boundary** and select arc flash PPE for the appropriate category.

NO

Do not use arc flash PPE categories method. Consult an engineer to provide conservative estimate.

4. Available **Incident Energy** at Working Distance, or Arc Flash PPE Category: _____ — EEWP II, 5.a.

5. **Arc Flash Boundary**: _____ — EEWP II, 5.c.

6. Arc Flash PPE: _____ Other PPE: _____ — EEWP II, 5.b.

All **qualified persons** entering the **arc flash boundary** must wear the selected arc flash PPE.
No **unqualified persons** shall be permitted to enter the **arc flash boundary.**

Continue to next page for **ENERGIZED ELECTRICAL WORK PERMIT.**

Is an **ENERGIZED ELECTRICAL WORK PERMIT** (EEWP) required?

Does the task to be completed involve **exposed**, **energized** conductors?

NO → Will you be interacting with the equipment when conductors or circuit parts are not exposed but an increased likelihood of injury from an exposure to an arc flash hazard exists, (i.e. racking)?

YES → Will you cross the **restricted approach boundary**?

NO → Will you be interacting with the equipment when conductors or circuit parts are not exposed but an increased likelihood of injury from an exposure to an arc flash hazard exists, (i.e. racking)?

YES → Will you be crossing the **restricted approach boundary** to perform a LO/TO procedure to place the equipment in an electrically safe condition?

NO → Will you be interacting with the equipment when conductors or circuit parts are not exposed but an increased likelihood of injury from an exposure to an arc flash hazard exists, (i.e. racking)?

YES → Will you be testing, troubleshooting, or voltage measuring?

NO → Will you be interacting with the equipment when conductors or circuit parts are not exposed but an increased likelihood of injury from an exposure to an arc flash hazard exists, (i.e. racking)?

NO → No EEWP required.

YES → Complete an EEWP.

YES → Will you be interacting with the equipment when conductors or circuit parts are not exposed but an increased likelihood of injury from an exposure to an arc flash hazard exists, (i.e. racking)?

NO → No EEWP required.

YES → Complete an EEWP.

Complete an **energized electrical work permit**.

Article 100 Definitions

Arc Flash Hazard: A dangerous condition associated with the possible release of energy caused by an electric arc.

Boundary, Arc Flash: When an arc flash hazard exists, an approach limit at a distance from a prospective arc source within which a person could receive a second degree burn if an electrical arc flash were to occur.

Boundary, Limited Approach: An approach limit at a distance from an exposed energized electrical conductor or circuit part within which a shock hazard exists.

Boundary, Restricted Approach: An approach limit at a distance from an exposed energized electrical conductor or circuit part within which there is an increased likelihood of electric shock, due to electrical arc-over combined with inadvertent movements, for personnel working in close proximity to the energized electrical conductor or circuit part.

De-energized: 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.

Energized: Electrically connected to, or is, a source of voltage.

Exposed (as applied to energized electrical conductors or circuit parts): Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to electrical conductors or circuit parts that are not suitably guarded, isolated, or insulated.

Incident Energy: The amount of thermal energy impressed on a surface, a certain distance from the source, generated during an electrical arc event. Incident energy is typically expressed in calories per square centimeter (cal/cm^2).

Qualified Person (see 110.2(D) for details): One who has demonstrated skills and knowledge related to the construction and operation of electrical equipment and installations and has received safety training to identify and avoid the hazards involved.

Shock Hazard: A dangerous condition associated with the possible release of energy caused by contact or approach to energized electrical conductors or circuit parts.

Unqualified Person: A person who is not a qualified person.