Job hazard analysis (JHA): Electrical panel work

Task: Electrical panel work	**Site or job:**
Crew:	**Date:**
Supervisor:	

No.	Job step	Hazard	Controls (most effective first)
1	Plan the job and decide to de-energize	Choosing to work live when it is not necessary	**Eliminate:** De-energize the panel and everything fed from it before working on or near the live parts. (29 CFR 1910.333(a)(1)) **Administrative control:** Decide the safe procedure for deenergizing before the circuits are opened. (29 CFR 1910.333(b)(2)(ii)(A)) **Administrative control:** Train employees who face a risk of shock in the electrical safety-related work practices that apply to their jobs. (29 CFR 1910.332(b)(1))
2	Notify people and locate the sources	A source is missed or someone re-energizes the panel	**Administrative control:** Review the panel directory and trace the feeder to the source. **Administrative control:** Tell other trades that a panel will be locked out, and where. **Administrative control:** Find out whether any part of an energized circuit is close enough to the work to be contacted, by inquiry, observation or instruments. (29 CFR 1926.416(a)(3))
3	Turn off, lock out and tag	Panel is turned back on while you are working	**Engineering control:** Disconnect the circuits from all electric energy sources; control devices like push buttons are not the sole means of deenergizing. (29 CFR 1910.333(b)(2)(ii)(B)) **Administrative control:** Place a lock and a tag on each disconnecting means used to deenergize the circuits. (29 CFR 1910.333(b)(2)(iii)(A)) **Administrative control:** Attach tags at all points where deenergized equipment or circuits can be energized. (29 CFR 1926.417(b)) **Administrative control:** Write the tag so it plainly identifies the equipment being worked on. (29 CFR 1926.417(c))
4	Release stored energy and verify dead	Capacitors or backfeed leave parts live	**Engineering control:** Discharge capacitors and short-circuit and ground high capacitance elements where stored energy might endanger people. (29 CFR 1910.333(b)(2)(ii)(C)) **Administrative control:** Have a qualified person use test equipment to confirm the circuit elements and parts are deenergized. (29 CFR 1910.333(b)(2)(iv)(B)) **Administrative control:** Test the tester on a known live source before and after. **PPE:** Wear insulating gloves and eye protection while testing.

No.	Job step	Hazard	Controls (most effective first)
5	Open the panel and work	Contact with energized neighboring parts	**Engineering control:** Guard any live parts left in the enclosure with insulation, barriers or covers, unless they are deenergized and grounded. (29 CFR 1926.416(a)(1)) **Engineering control:** Keep workspaces and walkways clear of cords and clutter. (29 CFR 1926.416(b)(2)) **Engineering control:** On a construction site, protect the temporary 120-volt, 15- and 20-amp receptacles that feed your tools with GFCIs, unless an assured equipment grounding conductor program is used. (29 CFR 1926.404(b)(1)(i)) **PPE:** Wear safety glasses, insulated gloves and non-conductive footwear.
6	Energized work, only if de-energizing is not feasible	Shock or arc blast during live work	**Administrative control:** Allow only qualified persons to work on parts that have not been deenergized. They must be familiar with the special precautionary techniques, PPE, insulating and shielding materials and insulated tools. (29 CFR 1910.333(c)(2)) **Administrative control:** Get a written approval from the employer or a supervisor and have a second qualified person standing by. **PPE:** Use rated insulating tools, gloves, face shield and arc-rated clothing selected for the equipment.
7	Restore power in the right order	Re-energizing on top of someone or a leftover tool	**Administrative control:** Have a qualified person verify that all tools, jumpers, shorts and grounds are removed, and warn exposed people to stay clear. (29 CFR 1910.333(b)(2)(v)) **Administrative control:** Have each lock and tag removed by the person who applied it. (29 CFR 1910.333(b)(2)(v)(C)) **Administrative control:** Make a visual check that all employees are clear before closing the disconnect. (29 CFR 1910.333(b)(2)(v)(D))
8	Close up and record the work	Panel left open or unmarked	**Engineering control:** Confirm the path to ground from the circuits, equipment and enclosure is permanent and continuous. Then replace all covers and dead fronts. (29 CFR 1926.404(f)(6)) **Administrative control:** Update the panel directory and note any changes for the next crew.

Required PPE

- Safety glasses
- Insulated, rated gloves
- Non-conductive footwear
- Hard hat, class E
- Arc-rated clothing and face shield for energized work

OSHA sections

29 CFR 1910.333 Selection and use of work practices; 29 CFR 1910.332 Training; 29 CFR 1926.416 General requirements; 29 CFR 1926.417 Lockout and tagging of circuits; 29 CFR 1926.404 Wiring design and protection

Reviewed with the crew. Names and signatures

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