



INDUCED VOLTAGE HAZARDS

TOOLBOX TALK: Induced Voltage Hazards

RATTLIR Safety Series – "Strike Before It Bites"

Purpose

High-voltage switchyards, especially those operating at voltages over 345 kV, create powerful electromagnetic fields capable of inducing hazardous voltage on nearby equipment, structures, and conductors. This toolbox talk explains how induced voltage develops, how to recognize energized objects, and how to work safely in areas where induction hazards may be present.





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How Induced Voltage Occurs

- High-voltage transmission lines create strong electric and magnetic fields around them.
- Metallic objects inside this field, including fences, tools, vehicles, and isolated conductors, can become energized without direct contact.
- Induced voltage increases with line voltage, distance, conductor length, and the size of the nearby object.
- In 500–765 kV switchyards, induction can reach dangerous levels capable of causing shock or arc initiation.

Recognizing Induction Hazards

- Long, isolated conductors or metal structures in the switchyard may carry unexpected voltage.
- Grounding cables may spark or snap when approaching an induced conductor.
- Tools, parked vehicles, or materials stored under lines can hold enough induced voltage to shock a worker.
- Windy conditions or line loading changes can increase induction unexpectedly.

Safe Work Practices

- Always apply personal protective grounds before working on de-energized but isolated conductors.
- Bond stored materials or long conductors to ground before touching or moving them.
- Use proper approach distances, even when equipment is believed to be de-energized.
- Never rely solely on visual indicators – use approved test equipment to verify absence of voltage.
- Ensure vehicles and equipment parked under high-voltage lines are grounded when required.

Discussion Questions

- Do you understand how induced voltage can appear on nearby equipment?
- Are you aware of grounding and bonding requirements in high-voltage areas?
- Do you have the proper test equipment and PPE today?



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RATTLIR Takeaway

Induced voltage is an invisible hazard that can energize tools, equipment, and conductors without warning. Staying vigilant, grounded, and prepared is the only way to eliminate the risk before it reaches you. RATTLIR strikes before it bites by helping crews recognize hidden energy and take action before exposure occurs.