



A REFERENCE
— GUIDE FOR —
**EMERGENCY
RESPONDERS**

Safely Managing
Electrical Hazards

FirstEnergy[®]



As an emergency responder, you are usually first to arrive at often dangerous situations that require immediate action. This has the potential to put you at risk for injury from downed wires and electrical fires resulting from storms, traffic accidents and other causes.

FirstEnergy recognizes your valuable role protecting the public by securing areas until we can make necessary repairs or de-energize equipment. Because your safety is our top priority, we urge you to exercise extreme caution when responding to any emergency involving electricity.

We know that understanding the potential dangers posed by electrical equipment and managing them correctly makes everyone safer. Toward that goal, this guide will help ensure you respond safely to various situations you may encounter before we can arrive quickly and safely at the scene.

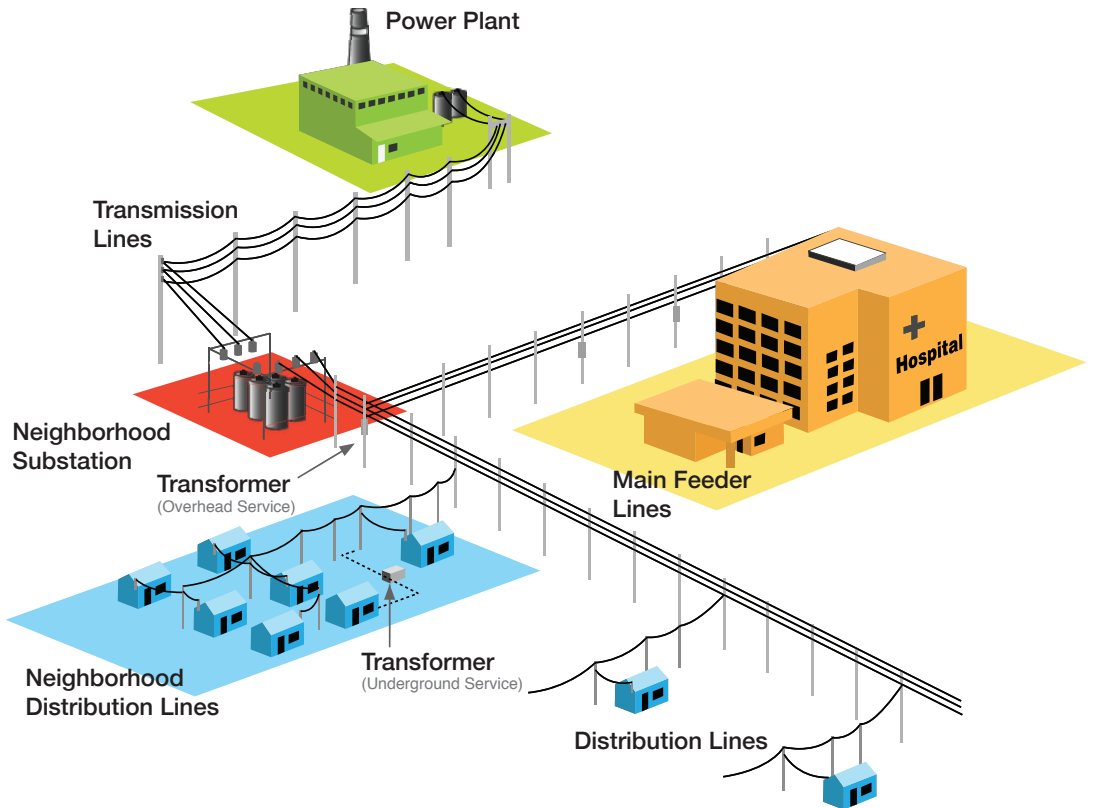


WHEN ELECTRIC EQUIPMENT IS INVOLVED IN ANY EMERGENCY INCIDENT, PLEASE CALL YOUR FIRSTENERGY UTILITY IMMEDIATELY AND PROVIDE THE FOLLOWING:

- Contact information
- Pole identification number, if available and located out of harm's way
- Closest address or nearest cross street
- Nature of emergency
- Other relevant information



THE ELECTRIC SUPPLY SYSTEM



ELECTRICAL SAFETY BASICS

Electrical shock is received when electrical current passes through body

- Severity of shock depends on
 - Path of electric current through body
 - Amount of current flowing through body, measured in amps
 - Duration of current through body
- Remember, low voltage does not mean low hazard
 - More people are killed from 120/240 volts than any other voltage
- Standard-issue protective gear does not insulate you against electric shock
- Electric shock and burn injuries may include internal tissue damage that is not immediately apparent
 - Ensure victims receive thorough medical attention

NEVER ATTEMPT TO DISCONNECT ELECTRICAL SERVICES

- Call your FirstEnergy utility immediately
- Never cut power lines
- Never try to remove electrical meters
 - This can be extremely dangerous and cause serious injury or death
- Never attempt to open or enter a manhole or vault (an underground room providing access to electrical equipment) until you're sure it's been de-energized
- Never touch or try to move power lines

APPROACHING SITE

- Examine your surroundings
 - Identify overhead lines, wire ends, leaning poles and sagging lines
 - Treat all utility lines as high voltage and assume all lines are energized
 - Keep yourself, others and equipment at least 30 feet away from downed power lines and electrical equipment until utility representatives arrive to de-energize lines
 - Always maintain maximum possible clearance
- If power lines or electrical equipment are involved in incident, call FirstEnergy immediately
 - Secure area and keep public at least 30 feet away

PARKING RESPONDER VEHICLES

- Position response vehicles two full spans, or three poles, away from damaged lines or equipment
- Don't park over manholes, vaults or subsurface enclosures

BEWARE OF HAZARDS – THINGS MAY NOT BE AS THEY APPEAR

- Don't assume a wire isn't energized just because it's not sparking
- Never assume a phone or coaxial cable line isn't energized
 - It's possible an energized power line nearby could be touching the phone or cable line, energizing it
 - What you think is a **phone** line could be a **power** line
- There may be hazards you can't see
 - A downed line could be hidden by vegetation or there could be an energized, downed line nearby

OVERHEAD WIRES AND EQUIPMENT

KEEP ALL PEOPLE, VEHICLES, MECHANICAL EQUIPMENT, TOOLS AND OTHER OBJECTS A SAFE DISTANCE FROM ENERGIZED OVERHEAD POWER LINES AND EQUIPMENT

- Consider equipment's proximity to lines when fully extended and use a spotter to help guide placement

OSHA Minimum Approach Standard

VOLTAGE	DISTANCE (in feet)
0-50 kV	10
50-200 kV	15
200-350 kV	20
350-500 kV	25
500-750 kV	35

NEVER USE A SOLID WATER STREAM TO FIGHT FIRES NEAR OVERHEAD POWER LINES BECAUSE THE STREAM CAN ACT AS A CONDUCTOR

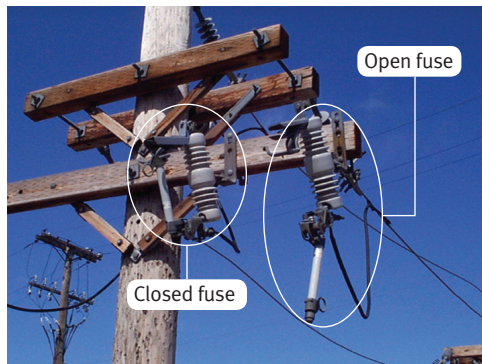
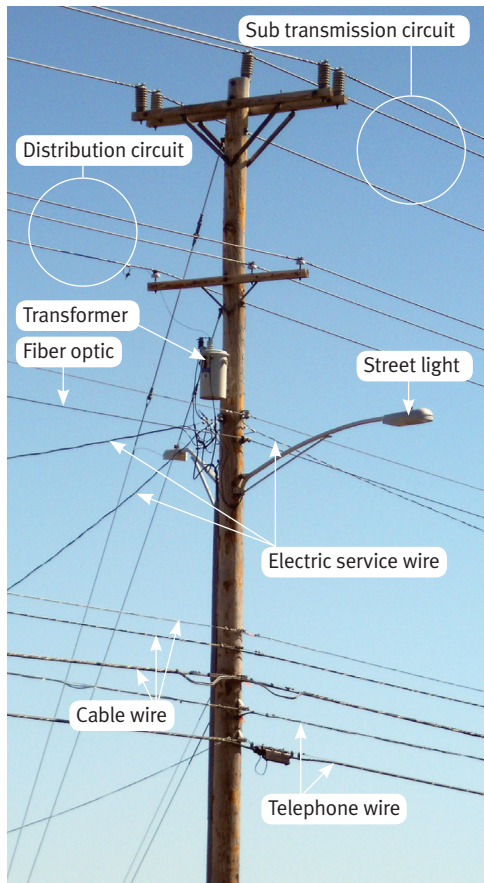
- If water must be used, use only mist or spray

IF EQUIPMENT CONTACTS A POWER LINE

- Equipment should be considered energized
- Call FirstEnergy immediately
- If you can do so safely, move equipment away from power line
- If equipment cannot be moved, stay put
- Warn others to stay away until FirstEnergy gives the all-clear
- If fire or other danger forces you from equipment, use step potential procedure described on pages 16 and 17 to exit vehicle safely



TYPES OF OVERHEAD EQUIPMENT



Open Style Fuse Cutouts

An open fuse does not always mean electricity is off. Consider ALL wires as energized.

USE EXTREME CAUTION NEAR DOWNED POWER LINES

- Secure area – keep yourself and public at least 30 feet away from downed power lines
 - Downed transmission lines require at least 100 feet of clearance
- Never touch or attempt to move downed lines
- “Potential,” as used with electric current, indicates a difference in voltage
 - Since electricity flows from higher voltage to lower voltage, a person whose body connects those points will become the path for the current to flow
- Avoid **indirect touch potential**, which can occur when an energized line causes other conductive materials to be energized



ENERGIZED ITEMS MAY INCLUDE:

Vehicles
Fences
Ladders
Trees
People



CONDUCTIVE MATERIALS

Metal
Water
Human Body
Smoke
Wood
Rope

AVOID STEP POTENTIAL

- Created when current from a downed line makes direct contact with ground
- Can seriously injure or kill someone who is walking near the point where energized wire makes contact with ground
- As electricity flows through the soil, the voltage dissipates with distance away from point of contact



IN STEP-POTENTIAL SITUATION:



Feet stay in contact

Keep both feet together and hop away from the electricity source.



Or move away by shuffling feet, heel to toe, so neither foot loses contact with the other and the ground.



Heels don't pass toes.

- A person's legs make better conductor than ground
- By walking across affected area, emergency responder could have each foot in different voltage zone
- Fatal charge could travel up one leg and down another to area of lesser voltage

Don't allow person inside energized vehicle to touch car and ground at same time.

Instruct passenger to pin feet together and hop out, then hop or shuffle to safety.



Person should not run or take large steps.
Demonstrate procedure from a distance.

POTENTIAL HIGH-RISK SITUATIONS

VEHICLE-POLE ACCIDENTS

- Do not approach, enter or come in contact with vehicles that may be energized
- Secure area – keep yourself and public at least 30 feet away from downed power lines
 - Downed transmission lines require at least 100 feet of clearance
- Call FirstEnergy immediately
- Instruct victim to drive vehicle away from power line if this can be done safely
- If vehicle cannot be moved, instruct occupants to stay put until FirstEnergy personnel give all-clear
 - Staying in vehicle is best protection against electric shock
- If person must exit vehicle, refer to step potential procedure on pages 16 and 17

EXCAVATION INCIDENTS

- Use extreme caution around excavation sites
- Wiring, equipment and people may be energized
- Do not touch anyone or anything that is in contact with electricity

TRANSFORMER FIRES

- Do not open or enter switch cabinets or pad-mounted transformers
 - Equipment contains live electrical components and coming in contact with them could result in death
- Call FirstEnergy immediately
- Let transformers burn until otherwise instructed by utility personnel

SUBSTATION FIRES AND EXPLOSIONS

- Evacuate area and keep everyone as far away as possible from the substation
- Let it burn – burning electrical equipment is already ruined and will be replaced
- Contact FirstEnergy and wait for our personnel to arrive
 - Never attempt to enter substation without utility personnel present
- Electrical equipment contains oil
 - Be alert for explosions and toxic smoke
- Protect nearby area to keep fire from spreading

VAULT FIRES AND EXPLOSIONS

- Call FirstEnergy immediately
- Secure scene and prohibit entry
- Do not enter vaults without FirstEnergy personnel on site
 - Vaults can explode more than once



EMERGENCY RESPONDER TIPS – DO'S AND DON'TS

DO

- Keep hands off electrical systems
- Communicate information from the field to FirstEnergy immediately
- Identify all overhead power lines and electrical equipment upon arrival at incident scene
- Assume all wires are energized and dangerous
- Ensure all equipment is kept a safe distance from overhead lines
- Ensure bystanders keep a safe distance away from incident scene
- Allow substation or transformer fires to burn, evacuate area, protect nearby exposures

DON'T

- Let a sense of urgency lead to hasty actions that might result in injury or death
- Touch a person or object in contact with a downed wire or attempt to remove wire
- Ever attempt to disconnect electrical service
- Assume a phone line or coaxial cable isn't energized
- Expect your protective gear to insulate you against electric shock
- Advise people trapped in a vehicle that's in contact with an electric wire to exit the vehicle unless absolutely necessary to ensure their safety
- Try to open or enter a manhole or vault until you're sure it's been de-energized

ADDITIONAL INFORMATION

This guide and other helpful resources for emergency responders are available by visiting www.firstenergycorp.com/emergencyresponder and include:

Safety and the Emergency Responder Presentation

Covers topics such as electricity basics, emergency procedures and keeping safe around electricity, and includes information about FirstEnergy's electrical system

FirstEnergy Service Restoration Process Video

Details the steps FirstEnergy takes to safely and efficiently restore power after an outage

Electricity – Recognizing and Avoiding the Hazards Video

Helps emergency responders understand and learn to safely manage the dangers posed by electrical equipment

Facilitator Guide for Emergency Responder Trainers

Provides the information and guidance needed to help deliver effective training sessions

Emergency Responder Quiz: Questions and Answers

Can be administered as a useful knowledge check to gauge training effectiveness and help plan future instruction

MAKE SAFETY A WAY OF

LIFE



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