

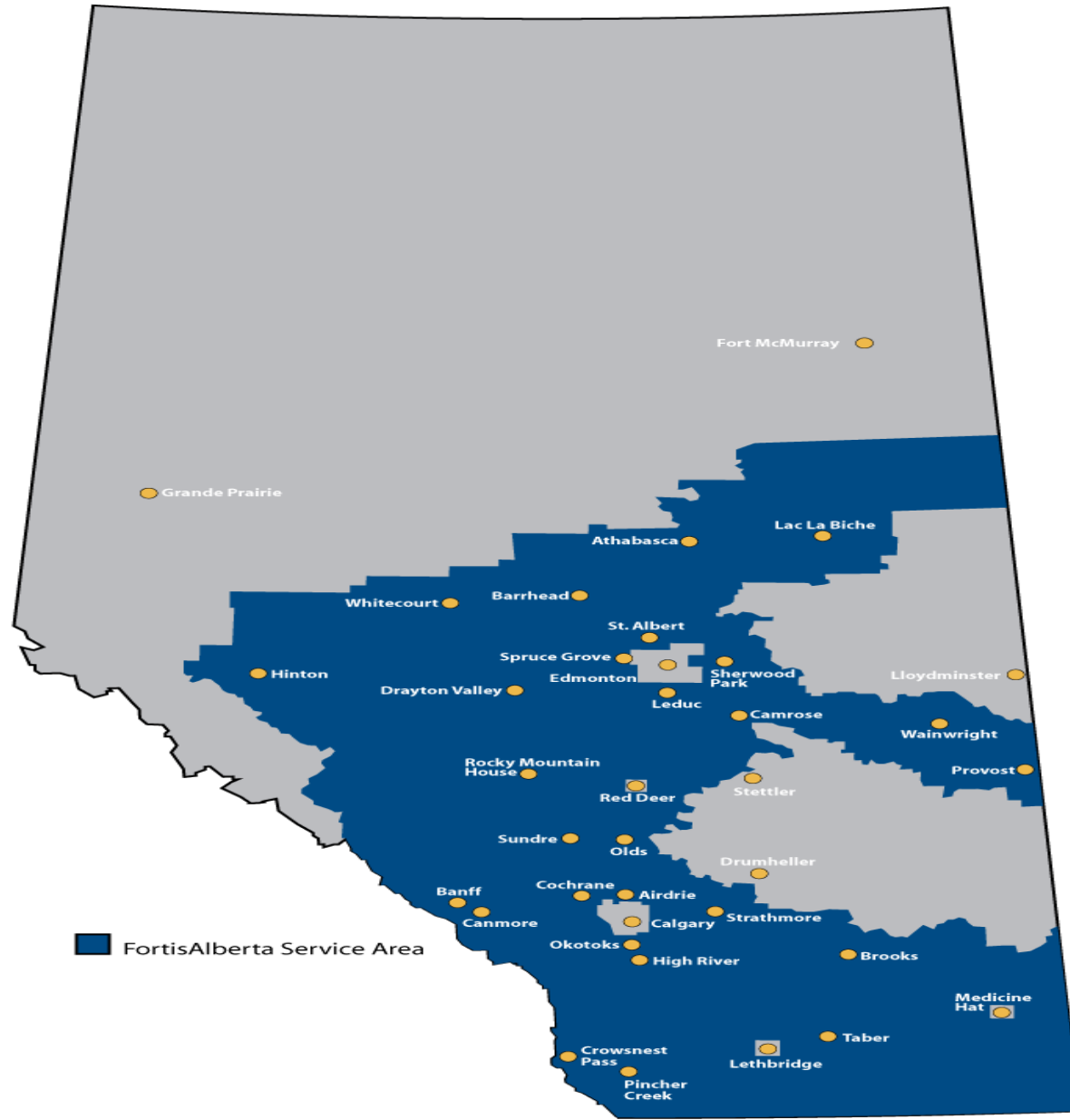
“Where’s The Line?”

Your Guide To Power Line Safety

Presented by:
FortisAlberta



- Owner & operator of more than 60% of Alberta's total electricity distribution network
- 110,000 km of distribution line
- 480,000 customers
- 200 communities across southern & central Alberta



“Where’s The Line?”

Goal for Today

- **Make your worksites a safer place to be**

To help reduce power line contact incidents by providing you with:

- **An awareness of the types of power line contacts that are occurring and the equipment striking the lines**
- **An awareness of the consequences of a power line strike**
- **An understanding of the regulations**
- **Some immediate safe work practices for working near power lines for workers and employers**
- **Some resources to use for help**

What is the Issue?

3 Albertans put themselves in jeopardy every day by contacting a power line



**Power Line Contacts have
Resulted in 6 Fatalities**



Incidents Involving Serious Electrical Burns



Incidents Involving Loss of Limbs



**304 Contacts in Total
223 on the Overhead System**

Equipment Involved:

- Track Hoe - 51
- Gravel Trucks - 29
- Air Seeders/Sprayers - 10
- Crane Trucks - 8
- Backhoe - 7



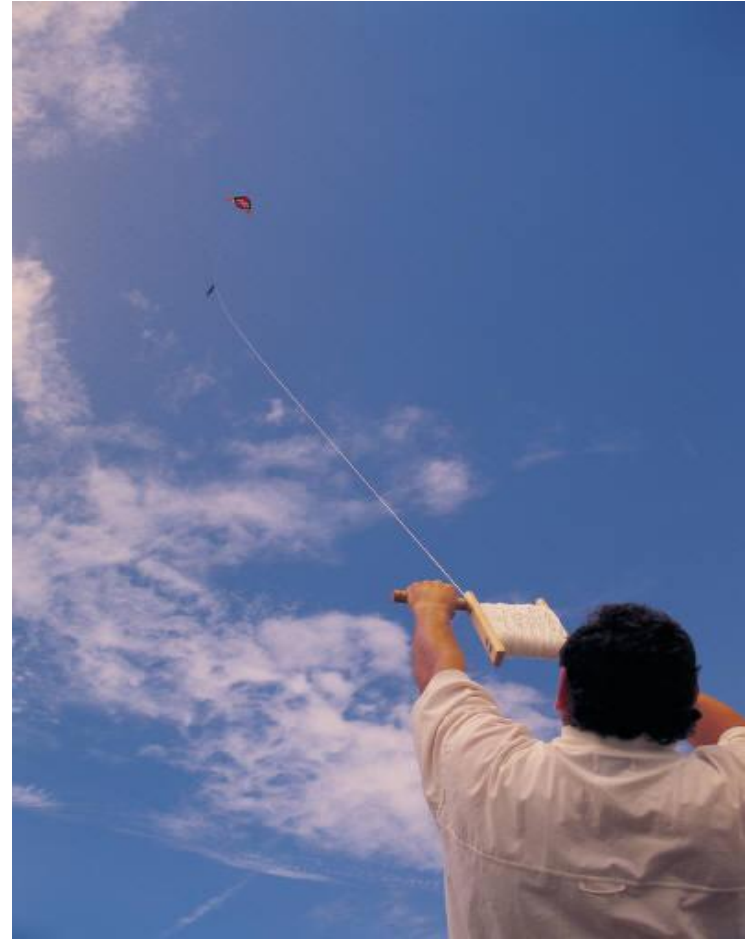
81 Contacts in Total

Equipment Types Involved in U/G Contacts:

- Back Hoe - 39
- Track Hoe - 7
- Power Auger - 6
- Directional Drill - 4



Even the Public Finds a Way



Consequence of Contact with a Power Line

- **Fatality**
- **Cardiac fibrillation and/or arrest**
- **Injuries are usually burns, often resuscitation is required.**
 - Injuries of this type usually have severe quality of life impacts on the victims and their families.
- **Entrance and exit wounds**
- **Internal electrical burns requiring months or years for recovery**
- **Loss of use of limbs**
- **Secondary infections**
- **Cosmetic damage**
- **Psychological damage (depression, suicide)**

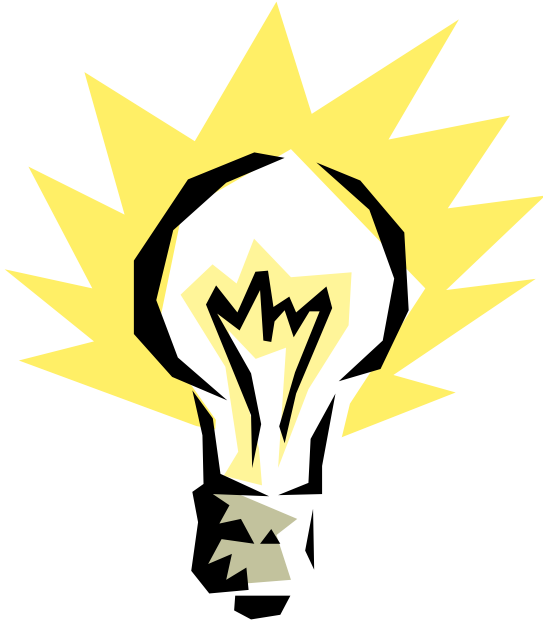


- **Electrical Burns become worse before they get better**





- 7 watt bulb draws 58 milliamps (mA) (Christmas tree bulb).



- 60 watt bulb draws 500 mA or ½ an amp.
- Does anyone know what amperage can send a heart into defibrillation?

What can Happen?

Less than one milliamp	No sensation
One to eight milliamps	Feel sensation of shock, though not painful
Eight to 15 milliamps	Painful shock
15 to 20 milliamps	Painful shock, loss of muscle control
20 to 50 milliamps	Severe muscle contractions
50 to 100 milliamps	Heart failure is possible
100 to 200 milliamps	Heart failure is possible
Over 200 milliamps	Severe burns and heart failure

- **Business losses for employers**
- **Negative impacts on community relations**
- **Lawsuits and legal proceedings (civil and criminal)**
- **Business losses for utility customers**

Other Impacts

- **Relationship damage and strain with family and others**
- **Loss of ability to work**
- **Substance abuse**
- **Quality of life**

Why Do Contacts Occur?

- **Complacency?**
- **New or inexperienced workers?**

- **Location of power line not included in job planning**
- **Workers not understanding the rules for working near power lines (lack of training)**

- 1). **Include** the location of the power lines in your pre job planning. Prior to beginning work at any site; always ask yourself:

“Where’s The Line?”

It is the most important question you can ask yourself on any site

- 2). **Understand** your legal Limits of Approach to Power Lines and ensure all your staff know
- 7m to overhead power lines
 - 1m to underground power lines
- **OHS Code Part 17 Section 225(1)**
“An employer must contact the power line operator before work is done or equipment is operated within 7 meters of an energized overhead power line”

- 3). **Educate** yourself and your staff on the 2 major electrical hazards; step potential & touch potential

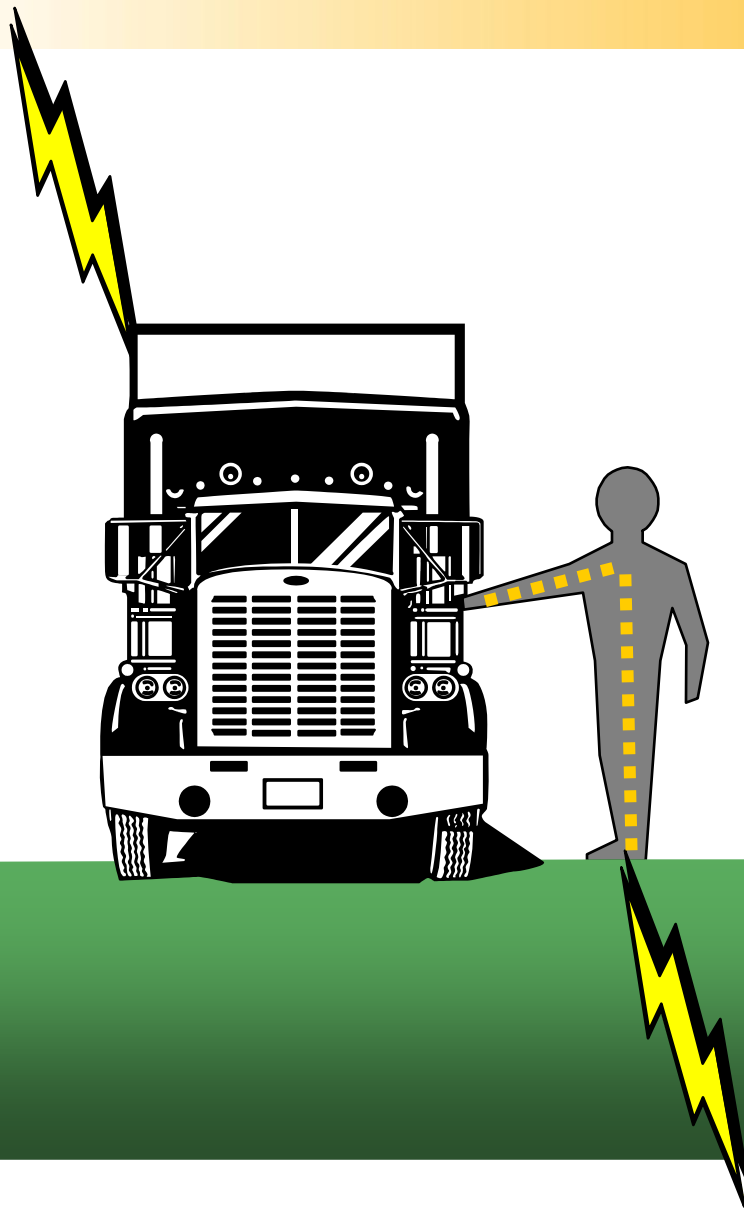
- 4). **Develop** an Emergency Response Plan should the worst occur and a contact is made

What is Happening Electrically During a Contact?

- **Touch potential causes electrocutions when you create the path to ground by touching an energized object**
- **Step potential causes electrocutions up to 10 m away for workers on the ground in the vicinity of the equipment (further for voltages above 60 kV)**
- **Fire and explosion as vehicles and equipment arc and burn**

Touch Potential

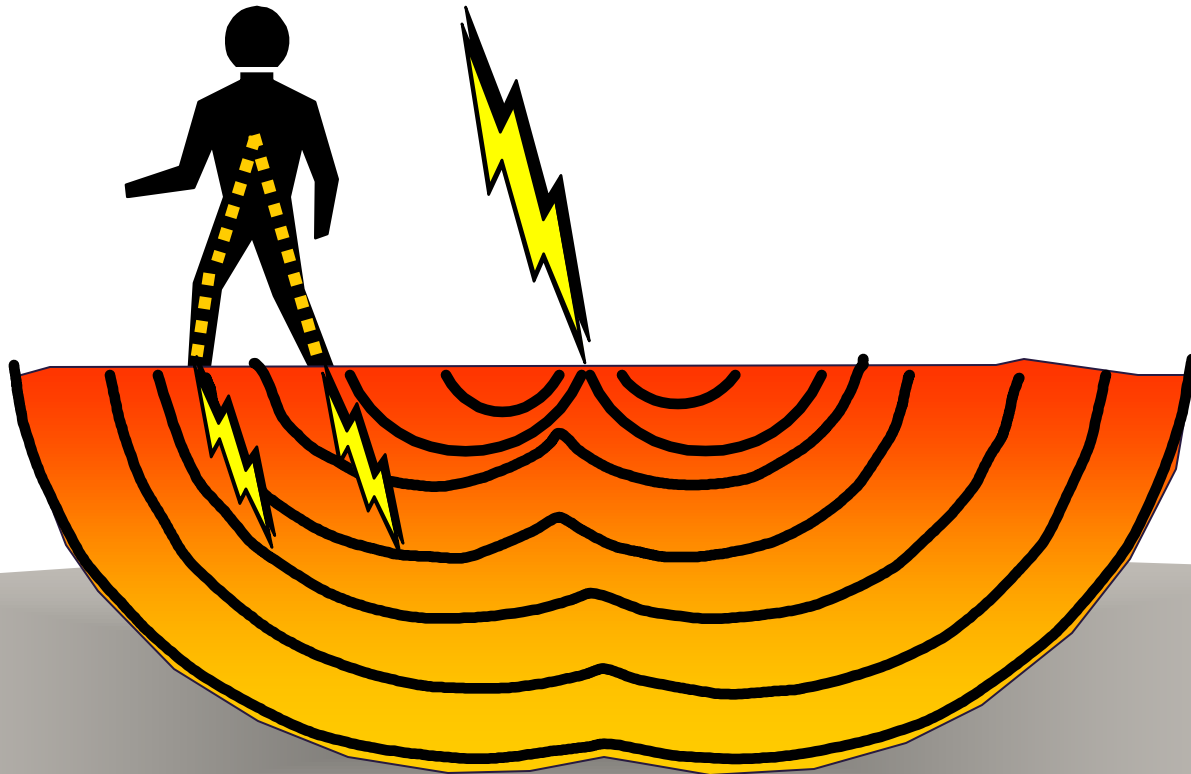
Vehicle is energized by some means





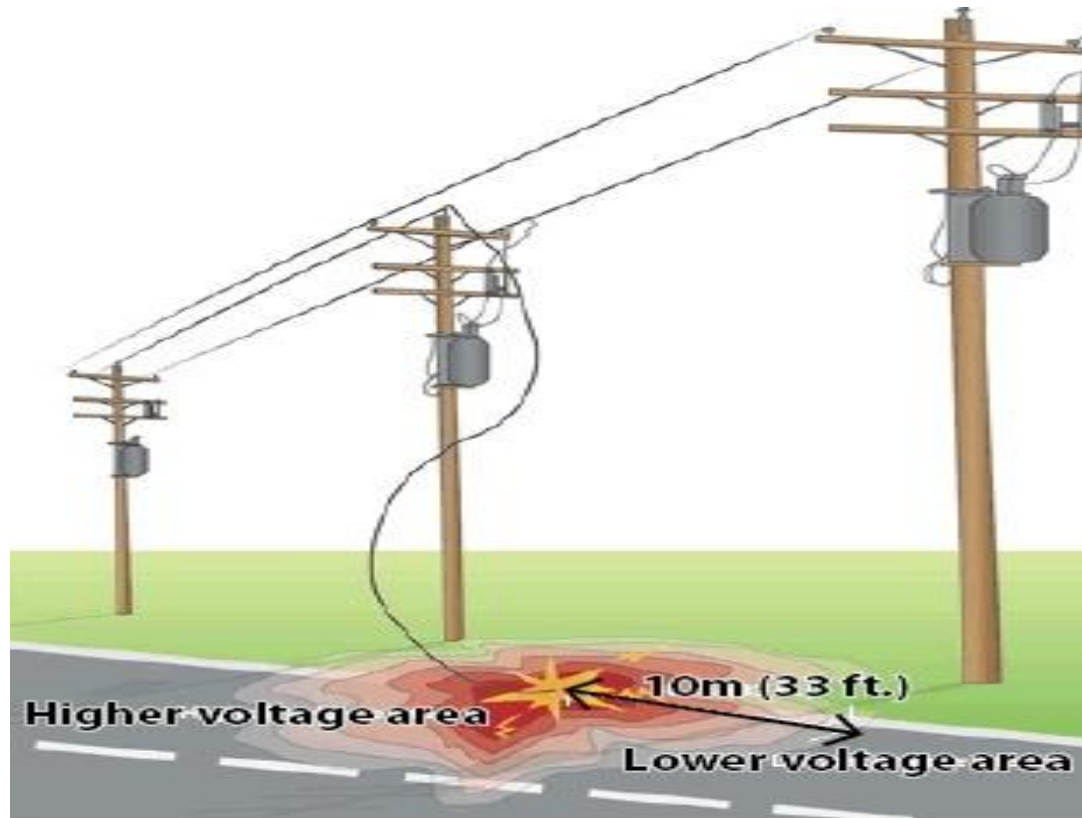
Step Potential

Ground becomes energized by some means



Step Potential

Think of step potential, like ripples in water!



Step Potential



- **Know what to do if an electrical emergency should occur**
- **If equipment or vehicle is still mobile after a contact:**
 - Stay in the equipment or vehicle
 - Move equipment or vehicle out of contact with the power line, and 10 m or more away (for 25 kV)
 - Contact emergency services and utility
 - Stay at the scene
 - Keep others well back

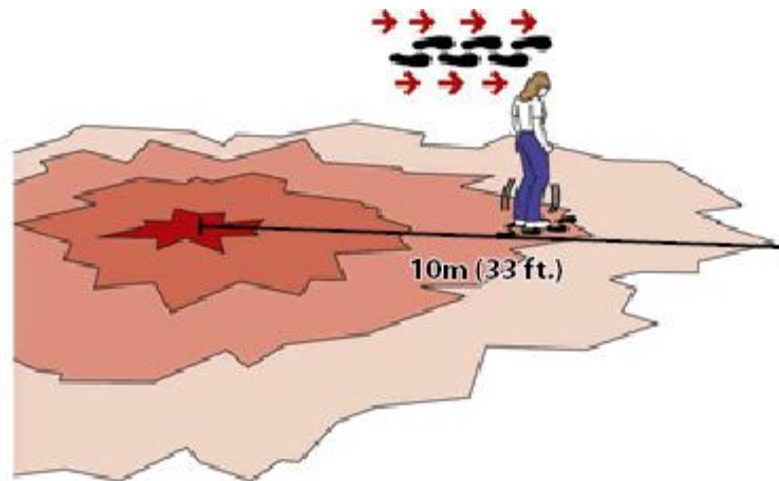
Develop an Emergency Response Plan

- **If the equipment or vehicle is immobilized:**
 - Stay in/on the equipment or vehicle
 - Contact emergency services and the utility
 - Keep others well back (at least 10m)

- **If the equipment or vehicle needs to be abandoned (catches fire):**
 - Follow emergency evacuation procedure
 - Exit equipment or vehicle without touching the equipment or vehicle and the ground simultaneously (jump clear but keep both feet together upon landing)
 - Shuffle or bunny hop 10 m away minimum (for 25 kV)

- **If you come upon equipment or vehicle which is in a power line contact incident:**
 - Stay well back of affected equipment or vehicle (minimum 10 m for 25 kV), do not attempt to rescue occupants
 - Contact emergency services and the electrical utility
 - Keep others outside of the 10 m distance, the further the better

Instruct occupants to jump clear and shuffle/bunny-hop for at least 10 m, before walking away!



To move through the energized zone, shuffle with very small movements or bunny hop, so that the voltage to each foot will be the same. Do this for a minimum distance of 10 m.

What is Being Done?

- **In 2006 all of the major utilities in Alberta and the Government of Alberta formed the Joint Utility Safety Team (JUST)**
- **The goal was to work together to target the high number of contacts across the province**
- **FortisAlberta delivers over 100 external presentations every year to emergency responders, excavators, the oil & gas industry or any other association where power line contacts are a possibility**

- **Development of “Where’s The Line?” message**
- **Ads target equipment operators, males 18-50**
- **Website <http://wherestheline.ca> for resources**
- **Research through Ipsos Reid involves interviews with those who have contacted power lines and those with strong safety records**

- **Working with Enform to establish training for all involved in the Oil & Gas Industry**
- **Curriculum has been developed**
- **The goal is to have the program ready for delivery by the end of the 2nd quarter of 2010.**

- **Educates workers on power line legislation and utility requirements**
- **Educates workers on incorporating power lines into pre-job planning and on site hazard identification processes**
- **Establishes safe work procedures for working near power lines**
- **Educates workers on emergency response procedures, should a contact occur.**

Video of a Line Contact



Thank You!!



Electrical incidents **can be avoided!**