Alaska Chapter NECA

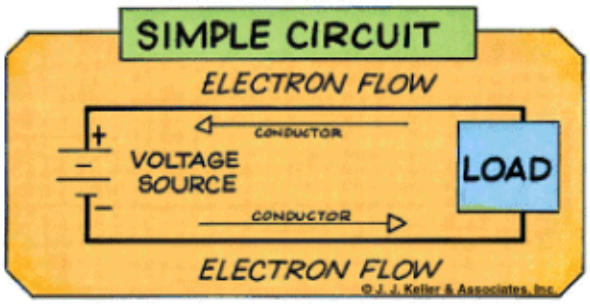
January 23, 2004 Alaska Chapter, NECA www.alaskaneca.org

Chapter Calendar

January 29	Health & Welfare Meeting
February 10	Safety Committee Meeting
February 11	Board Meeting 4:30pm Membership Meeting 6pm
February 25-27	Pension Meeting
October 16-19	National Convention
December 11	Annual Meeting

Tool Box Talks

February 02	Ceiling and Overhead Work
February 09	Circuit Breaker Panelboards
February 16	Cold Weather Safety
February 23	Commercial Vehicles



How electrical current affects the human body

Three primary factors affect the severity of the shock a person receives when he or she is a part of an electrical circuit:

- Amount of current flowing through the body (measured in amperes).
- Path of the current through the body.
- Length of time the body is in the circuit.

Other factors that may affect the severity of the shock are:

- The voltage of the current.
- The presence of moisture in the environment.
- The phase of the heart cycle when the shock occurs.
- The general health of the person prior to the shock.

Effects can range from a barely perceptible tingle to severe burns and immediate cardiac arrest. Although it is not known the exact injuries that result from any given amperage, the following demonstrates this general relationship for a 60-cycle, hand-to-foot shock of one second's duration:

Current level of 1 mA – Perception level. Slight tingling sensation. Still dangerous under certain conditions.

Current level of 5 mA – Slight shock felt; not painful but disturbing. Average individual can let go. However, strong involuntary reactions to shocks in this range may lead to injuries.

Current level of 6-30 mA – Painful shock, muscular control is lost. This is called the freezing current or "let-go" range.

Current level of 50-150 mA – Extreme pain, respiratory arrest, severe muscular contractions. Individual cannot let go. Death is possible.

Current level of 1000-4300 mA – Ventricular fibrillation (the rhythmic pumping action of the heart ceases.) Muscular contraction and nerve damage occur. Death is most likely.

Current level of 10,000 mA – Cardiac arrest, severe burns, and probable death.

Wet conditions

Wet conditions are common during low-voltage electrocutions. Under dry conditions, human skin is very resistant. Wet skin dramatically drops the body's resistance.

Dry Conditions: Current = Volts/Ohms = 120/100,000 = 1mA a barely perceptible level of current

Wet conditions: Current = Volts/Ohms = 120/1,000 = 120mA sufficient current to cause ventricular

fibrillation

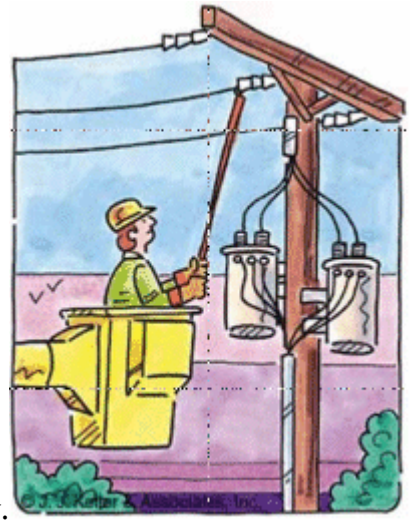
Fall hazards from shock
If the extensor muscles are excited by the shock, the person may be thrown away from the circuit. Often, this can result in a fall from elevation that kills a victim even when electrocution does not.

Low voltage hazards
When muscular contraction caused by stimulation does not allow the victim to free himself from the circuit, even relatively low voltages can be extremely dangerous, because the degree of injury increases with the length of time the body is in the circuit. LOW VOLTAGE DOES NOT IMPLY LOW HAZARD!

100mA for 3 seconds = 900mA for .03 seconds in causing fibrillation

Note that a difference of less than 100 milliamperes exists between a current that is barely perceptible and one that can kill.

High voltage hazards
High voltage electrical energy greatly reduces the body's resistance by quickly breaking down human skin. Once the skin is punctured, the lowered resistance results in massive current flow.



Overhead powerline hazards

Most people do not realize that overhead powerlines are usually not insulated. More than half of all electrocutions are caused by direct worker contact with energized powerlines. Powerline workers must be especially aware of the dangers of overhead lines. In the past, 80% of all lineman deaths were caused by contacting a live wire with a bare hand. Due to such incidents, all linemen now wear special rubber gloves that protect them up to 34,500 volts. Today, most electrocutions involving overhead powerlines are caused by failure to maintain proper work distances.

Shocks and electrocutions occur where physical barriers are not in place to prevent contact with the wires. When dump trucks, cranes, work platforms, or other conductive materials (such as

pipes and ladders) contact overhead wires, the equipment operator or other workers can be killed. If you do not maintain required clearance distances from powerlines, you can be shocked and killed. (The National Institute for Occupational Safety and Health reminds employees the minimum distance for voltages up to 50kV is 10 feet. For voltages over 50kV, the minimum distance is 10 feet plus 4 inches for every 10 kV over 50kV.)

Never store materials and equipment under or near overhead powerlines.

Take workplace chemicals seriously

Millions of workers are exposed (or potentially exposed) to chemical hazards in their workplace. OSHA's hazard communication standard (a.k.a. the right-to-know law) says that employees have the right to know about chemical hazards in their workplaces. This standard includes specific requirements that chemical manufacturers and employers have to follow to communicate this information to you.

The hazard communication standard was really designed for your protection. Knowing about its provisions is a good way for anyone who works with hazardous chemicals to protect him or herself from their hazards.

What is in the HazCom standard?

The areas covered by the hazard communication standard include:

- A hazard assessment
- Written program
- Labels and labeling
- Material safety data sheets
- Employee training

Find out about specific elements to your company's hazard communication program by reading the written program, locating the material safety data sheets, and learning how to read hazard labels.

What are hazardous substances?

A toxic or hazardous substance regulated under this standard is any substance that has the capacity to produce personal injury or illness to man through ingestion, inhalation, or absorption through any body surface.

This regulation is concerned with two main hazard categories: health hazards and physical hazards.

Health hazard
A chemical for which there is statistically significant evidence based on at least one study that acute or chronic health effects may occur upon exposure.

Types of Health Hazards:
- Acutely toxic
- Chronically toxic
- Carcinogenic
- Mutagenic
- Teratogenic
- Sensitizing Agent
- Corrosive
- Irritant

Physical hazard
A chemical for which there is valid evidence that it is a combustible liquid, compressed gas, explosive, flammable, organic peroxide, oxidizer, pyrophoric, or unstable (reactive) or water-reactive, is known as a physical hazard.

Hazard labels
Your employer may keep original labels on containers or label the hazardous substances in your facility with one of many labeling systems. Two of the most common of these systems are National Fire Protection Association (NFPA) labels and Hazardous Materials Identification System (HMIS) labels. NFPA labels are diamond shaped. HMIS labels list hazard warnings in a series of bars.

Both systems color code hazards in the following way:
- Blue—health
- Red—flammability
- Yellow—reactivity
- White—special hazard (NFPA only)
- PPE (HMIS only)

Your employer will explain the system(s) used in your workplace, and how to interpret them.

Routes of entry
There are many ways that you can come into contact with, or be exposed to hazardous substances at work. Problems occur when these hazardous substances find their way into your body. There are three common routes of entry into the human system: skin contact, ingestion, or inhalation.

Skin contact
Liquids might get on the skin accidentally, through a spill, or intentionally, through a job

process. Some chemicals will cause an external reaction, a burn or an irritation. Certain chemicals will penetrate the skin and enter the system, possibly with severe results.

Ingestion
Another way that exposure occurs is through swallowing. A chemical that cannot penetrate the skin is often introduced into the body when you touch your mouth with contaminated fingers. Drinking and eating in high risk areas increases the chance of inadvertently swallowing a toxic material.

Inhalation
Breathing in toxic dust or vapors is the exposure method most difficult to control. That is because you may inhale a harmful substance without being aware of it. It is hard to take precautions if you do not realize a situation is occurring.

The way contact is made can determine whether or not the substance has an effect. Certain nickel compounds can cause serious health effects if inhaled, but are relatively harmless if swallowed. Ammonia, however, can irritate the eyes and skin and can also have harmful effects if swallowed.

Learning about chemical hazards at your workplace is important for all workers. It is the first step to preventing exposure to and possible occupational illness from workplace chemicals.

Watch out for angry vehicles!

If vehicle safety practices are not observed at your site, you risk being pinned between construction/utility vehicles and walls, struck by swinging backhoes, crushed beneath overturned vehicles, or other similar accidents. If you work near public roadways you risk being struck by trucks or cars.

How do I avoid hazards?

- Wear seat belts that meet OSHA standards, except on equipment that is designed only for standup operation.
- Check vehicles before each shift to assure that all parts and accessories are in safe operating condition.
- Do not drive a vehicle in reverse gear with an obstructed rear view, unless it has an audible reverse alarm, or another worker signals that it is safe.
- Drive vehicles or equipment only on roadways or grades that are safely constructed and maintained.
- Make sure that you and all other personnel are in the clear before using dumping or lifting devices.
- Lower or block bulldozer and scraper blades, end-loader buckets, dump bodies, etc., when not in use, and leave all controls in neutral position.
- Set parking brakes when vehicles and equipment are parked, and chock the wheels if they are on an incline.
- All vehicles must have adequate braking systems and other safety devices.
- Haulage vehicles that are loaded by cranes, power shovels, loaders etc., must have a cab shield or canopy that protects the driver from falling materials.

- Do not exceed a vehicle's rated load or lift capacity.
- Do not carry personnel unless there is a safe place to ride.
- Use traffic signs, barricades or flaggers when construction takes place near public roadways.
- Workers must be highly visible in all levels of light. Warning clothing, such as red or orange vests, are required; and if worn for night work, must be of reflective material.

Sports Trivia

Question: *In football, what is the origin of the word "quarterback"?*

a.) The highest-paid players in the early days of football were paid a quarter of the team's collective salary.

b.) The quarterback was positioned one quarter of the way between the linemen and the fullback.

c.) The ideal throwing motion was considered to be a quarter of the way back behind the ear.

d.) Fans used to throw quarters at these players in displays of admiration for especially strong performances

Answer: Correct answer is (b). In American football, the backfield consists of four players behind the linemen. The one farthest back from the line was called the fullback (fully back from the line). Two players were positioned halfway between the linemen and the fullback and were called halfbacks. The man closest to the line was positioned one quarter of the way between the linemen and the fullback and hence became the quarterback.