Safety Facts:

Arc Flash*

The National Fire Protection Association describes arc flash as "a dangerous condition associated with the release of energy caused by an electric arc." Arc flash is an accidental electrical explosion usually caused by a short circuit. It happens at higher voltages (around 300 volts and above) and causes electrical conductors to melt, creating a blast of molten or even vaporized metal. Temperatures can be as high as 20,000 degrees Celsius.

Why is it important?

Arc flash can cause severe damage to equipment, and in some cases, equipment is so significantly damaged that replacement is the only option. Injuries from electrical energy are a leading cause of fatalities in the workplace in Canada, ranking as the fifth- or sixth-highest cause of occupational deaths.

Key characteristics of arc flash

An arc flash (also called a flashover) is the light and heat produced as part of an arc fault. This electrical explosion or discharge occurs during a fault or short circuit condition passes through this arc gap. An arc flash event can expel large amounts of deadly energy. The arc causes an ionization of the air and arc flash temperatures hotter than the sun's surface. Arc flash is distinct from the arc blast – the supersonic shockwave produced when the uncontrolled arc vaporizes the metal conductors.

Both are part of the same arc fault, often referred to as an arc flash, but they are often treated separately from a safety standpoint.

Associated risks/hazards

Task demands:

- Time pressure, high workload
- Multiple, repetitive tasks or boredom
- Critical steps or irreversible acts
- Unclear goals, roles, or responsibilities
- Lack of or unclear standards and requirements

Work environment:

- Distractions/interruptions/changes
- Confusing/unexpected equipment displays, controls, conditions
- Workarounds/out of service instrumentation
- Personality conflicts

Individual capabilities:

- An unfamiliar task or new technique
- Lack of knowledge or experience
- Unclear communication habits
- Unclear problem-solving skills
- Unsafe attitudes for a critical task
- Inappropriate values

Preventive next steps

- □ Establish a written safety program with clearly defined responsibilities, policies and lockout/tagout processes for electrical safety.
- □ Conduct an electrical system analysis to determine the degree of arc flash hazard present at your workplace and required personal protective equipment (PPE) for any work with exposed energized parts.
- □ Conduct safety training for all employees specific to arc flash, arc blast, shock, and electrocution hazards.
- □ Ensure the proper tools are on hand for safe electrical work – including insulated voltage-rated hand tools and appropriately rated, insulated voltage sensing devices for the voltage application of the equipment to be tested.
- □ Any electrical equipment requiring servicing or maintenance while energized must have arc flash warning labels posted.
- □ Examples include:
  - » switchboards
  - » panel boards
  - » industrial control panels
  - » meter socket enclosures
  - » motor control centers
- □ Appoint an electrical safety program manager.
- □ Maintain all electrical distribution system components.
- □ Maintain and update all electrical distribution documentations.

*** For additional resources visit:**

Workplace electrical safety | CSA Z462:21

Arc Flash

Toolbox Talk

Name of Facilitator: _____ **Date:** _____

Supervisor Signature: _____ **Date:** _____

Employee feedback/questions/recommendations

Workers who attended

Name	Initial	Name	Initial

Key Talking Points (Facilitator Notes)