Electrical Safety for Cold & Wet Conditions Compliance Game Plan

While electrical shock may occur at any time, workplace incidents across Canada peak during the fall, winter, and spring thaw. It's not hard to understand why. Risk of electrical shock increases significantly in wet, snowy, and freezing conditions. Water lowers skin resistance. Cold damages insulation and cords. Toss in temporary power sources, portable power tools, portable heaters, and other risk factors associated with winter and rainy work, and you get a perfect storm for serious and fatal injury. This is especially true in construction, utilities, mining, warehousing, municipal operations, and outdoor maintenance. Here's an eight-step Safety and Compliance Game Plan to protect your workers.

Step 1. Identify All Applicable Safety Standards

As Occupational Health and Safety (OHS) coordinator, you must verify that your company meets its duty to ensure that all electrical equipment used at the workplace is safe for the job, properly maintained, and appropriate for the work environment and conditions, including moisture and cold. These duties are spelled out in:

- OHS electrical safety regulations.
- The *Canadian Electrical Code*.
- Provincial electrical codes and regulations.
- CSA Z462.
- Manufacturers' instructions and manuals.

Step 2. Identify and Assess Shock Hazards

The competent person(s) who performs hazard assessment at your workplace should account for heightened shock hazards due to cold and moisture. **Action Points:** First, assess hazardous environmental conditions, including:

- Exposure to moistness.
- Sub-zero temperatures.
- Condensation from temperature changes.
- Ice and snow buildup on cords and connections.

Identify all work operations involving electrical shock hazards that workers may perform in cold and wet conditions, which may include:

- Outdoor work using portable power tools.
- Temporary power setups (construction, shutdowns, repairs).
- Extension cords in snow, slush, or standing water.
- Pressure washing, washdowns, or thawing operations.
- Work in refrigerated or unheated spaces.
- Use of heaters, heat trace cables, and temporary lighting.

3. Implement Mandatory GFCI Protection

Select practicable engineering controls for each risk you identify, including Ground Fault Circuit Interrupters

(GFCIs). **Action Points:** Create and implement safety policies and procedures for controlling electrical hazards in cold and wet conditions that, at a minimum, require the use of:

- GFCIs on all 120-volt, 15, and 20-amp circuits used outdoors.
- GFCIs for any equipment operated in wet or damp locations.
- Portable GFCI devices for temporary power and extension cords.

Policies should caution workers to avoid common GFCI pitfalls like:

- Removing GFCIs because they "trip too often"—ensure workers understand that a GFCI trip is a warning sign, not an inconvenience.
- Not regularly testing and inspecting GFCIs.
- Relying on panel protection only, especially at older sites.

Step 4. Control Extension Cord and Temporary Wiring Hazards

Beware of extension cord hazards in the winter. Recognize that subfreezing temperatures may cause insulation to become brittle resulting in micro-cracks that can expose conductors, especially when moisture seeps into the cracks.

Action Points: Ensure your electrical safety policies and procedures ban household-grade extension cords or on worksites while requiring workers to use only extension cords that are:

- CSA-approved.
- Rated for outdoor and cold weather use.
- Free of damaged insulation, cracked jackets, and exposed conductors.

- Removed from service immediately if stiffness or cracking is observed.

Ban daisy-chaining of extension cords and specify that connections must elevated, shielded, and kept off the ground and away from water.

Step 5. Ensure Electrical Equipment Is Designed for Wet and Cold Environments

The electrical equipment you use in normal conditions may be unsafe in the cold and wet. **Action Points:** Ensure that your safety policies and procedures for work in cold and wet environments require workers to use:

- Tools that are rated for outdoor or wet use.
- Enclosures with proper Ingress Protection (IP) or National Electrical Manufacturers Association (NEMA) ratings.
- Lighting designed for moisture and temperature extremes.
- Battery-powered tools where feasible (lower shock risk).

Red flags to guard against:

- Use of indoor-rated tools outside, even if it's for "just for a bit".
- Plugging temporary heaters into extension cords.
- Use of makeshift covers over electrical panels or plugs.

Step 6. Train Workers on Cold-Weather Electrical Hazards

Generic electrical safety training isn't enough for performing electrical work in cold and damp conditions.

Action Points: To guard workers from shock risks, train them to understand that:

- Wet gloves and clothing increase shock severity.
- Cold reduces reaction time and grip strength.
- Snow and ice hide damaged cords.
- Metal surfaces conduct electricity more readily in damp conditions.

Electrical safety training should include:

- Visual examples of cold-weather cord damage.
- How to test GFCIs properly.
- When to stop work due to unsafe conditions.
- Workers' OHS rights to refuse unsafe electrical work.

Keep records documenting the training you provide and the steps you take to verify that workers actually understand and are capable of applying it.

Step 7. Enforce Lockout and De-Energization in Cold and Wet Conditions

Of course, work is especially dangerous when it's performed on energized electrical equipment.

Action Points: As in normal conditions, the best way to protect workers who perform these high-risk operations in cold and wet conditions is to implement lockout tagout procedures to deenergize the equipment and ensure it's completely isolated from its power source before the work begins, including repairs, thawing, or adjustments. Expressly prohibit "quick fixes" on live equipment during rain, snow, or freezing conditions.

Step 8. Inspect Electrical Equipment

Ensure that electrical equipment is properly inspected in accordance with the manufacturer's specifications.

Action Points: Regular inspection should cover:

- Extension cords and plugs.
- GFCI function.
- Temporary panels and power bars.
- Portable heaters and lighting.
- PPE used around electrical hazards.

Equipment found to be defective or unsafe should be immediately tagged and removed from service and either thrown away or restored to service only after it's properly repaired and certified to be safe for use. Keep written records documenting inspections, who carried them out, inspection date, findings, and any corrective or follow-up actions taken. Also require supervisors to maintain daily winter electrical safety logs documenting the steps taken to identify and control cold and wet hazards of each work shift.