
Electrical Safety Inspection & Arc Flash Risk Assessment for Workshop Environments

1.0 Objective & Intent

The objective of this Standard Operating Procedure (SOP) is to establish a mandatory, repeatable process for conducting an electrical safety inspection and arc flash risk assessment within the cabinet and millwork workshop. This procedure is designed to identify potential electrical hazards, assess the risk of arc flash incidents, and implement control measures to protect personnel from severe injury or fatality. Compliance with WorkSafeBC regulations (OHS Regulation Part 19 – Electrical Safety) is mandatory. The specific risk mitigated by this SOP is the catastrophic release of energy from an arc flash event, which can cause severe burns, blast injuries, hearing loss, and death.

2.0 Operational Scope

This procedure applies to all qualified electrical maintenance personnel, safety officers, and authorized contractors performing electrical safety inspections and arc flash risk assessments on all electrical equipment within the workshop. This includes, but is not limited to, main distribution panels, sub-panels, motor control centers (MCCs), disconnect switches, variable frequency drives (VFDs), and any electrical enclosure with a voltage rating of 50 volts or greater. This procedure covers all workshop areas including the main production floor, finishing room, dust collection system electrical rooms, and maintenance shop.

3.0 Hazard Identification & Mandatory PPE

- Arc Flash: High-energy electrical explosion causing severe burns, blast pressure, and molten metal spray.
- Shock Hazard: Contact with energized conductors resulting in electrocution or cardiac arrest.
- Fire Hazard: Ignition of combustible dust (wood dust) or flammable finishes from electrical fault.
- Arc Rated (AR) Face Shield with balaclava (minimum 8 cal/cm² rating for initial inspection).
- Arc Rated (AR) Long-Sleeve Shirt and Pants (minimum 8 cal/cm² rating).
- Arc Rated (AR) Rubber Insulating Gloves with leather protectors (rated for system voltage).
- CSA-Approved Safety Glasses (worn under face shield).
- CSA-Approved Steel Toed Boots (dielectric rated).
- Hard Hat (with arc rating if required by assessment).
- Hearing Protection (earplugs or earmuffs rated for impulse noise).
- Flame-Resistant (FR) Clothing (if AR clothing is not available, FR clothing must be worn as a base layer).

4.0 Required Safety Equipment & Tools

- Lockout/Tagout (LOTO) Kit with personal lock, group lock box, and hasp.
- Certified Voltage Tester (CAT III or CAT IV rated, with proven test function).
- Non-Contact Voltage Detector (for initial verification only).
- Insulated Hand Tools (rated for system voltage, e.g., screwdrivers, pliers).
- Arc Flash Hazard Analysis Software or Label (NFPA 70E compliant).
- Thermal Imaging Camera (for detecting hot spots).

- Infrared Thermometer (non-contact).
- Flashlight (explosion-proof if in combustible dust area).
- Safety Barrier Tape and Cones (to establish arc flash boundary).
- First Aid Kit (including burn treatment supplies).
- Fire Extinguisher (Class C rated for electrical fires).

5.0 Step-by-Step Safety Procedure

1. Review the facility's electrical single-line diagram and arc flash hazard analysis labels. Identify all equipment to be inspected and verify the incident energy levels and arc flash boundaries for each piece of equipment.
2. Notify all affected personnel in the workshop of the planned electrical safety inspection. Post warning signs and establish the arc flash boundary using safety barrier tape and cones. Ensure no unauthorized personnel enter the boundary.
3. Don all required arc-rated PPE as specified in Section 3.0. Perform a visual inspection of the PPE for any damage or wear. Ensure the face shield is properly attached and the balaclava is worn underneath.
4. Perform a risk assessment of the specific equipment. Determine if the inspection can be performed with the equipment de-energized. If de-energized, follow the facility's Lockout/Tagout (LOTO) procedure to isolate and verify zero energy state before proceeding.
5. If the inspection must be performed on energized equipment (e.g., for thermal imaging), use the non-contact voltage detector to confirm the presence of voltage. Maintain a safe distance from exposed conductors. Use the thermal imaging camera to scan for hot spots, recording any anomalies.
6. For de-energized equipment, after LOTO is applied, use the certified voltage tester to verify zero energy state on all phases. Test the tester on a known live source first, then test the equipment, then re-test the tester to confirm it is functioning correctly.
7. Open the electrical enclosure using insulated tools. Visually inspect for signs of overheating (discoloration, melting), loose connections, corrosion, moisture ingress, or pest infestation. Use the infrared thermometer to check connection temperatures if accessible.
8. Document all findings on the SafeDesk digital inspection form. Include photographs of any hazards, thermal images, and notes on equipment condition. Record the arc flash boundary distance and incident energy level for each panel.
9. Close and secure the electrical enclosure. Remove LOTO devices only after all personnel are clear and the inspection is complete. Re-energize the equipment following the facility's re-energization procedure.
10. Debrief with the safety officer and maintenance team. Update the arc flash hazard analysis labels if any changes were identified. File the inspection report in the SafeDesk system and schedule any required corrective actions.

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