PRAIRIE HVAC ELECTRICAL ENERGY LOCK AND TAG PROCEDURE

In-Plant procedures by the owner or client take precedence over the procedures outlined here, providing there is not contravention of existing codes or statutes or they do not undermine the following:

1) **Preparation Before Shut Down**

   Review drawings of the system to be de-energized and de-activated to determine the means of isolating the electrical power source. Notify affected employees of the lockout. For example, tell the facility manager/maintenance person that you are locking out a compressor to perform maintenance.

2) **Shut Down**

   Shut down the system using the normal stopping procedure for that piece of equipment. This may be as simple as turning a selector switch to the "**off**" position or may involve a partial or complete pump down.

3) **Isolate the Equipment**

   a) If the prime mover is supplied power from a Motor Control Centre (MCC) with individual disconnects, open the switch.

   b) If the equipment is fed from a single disconnect where other motors are still required for the process, the recommended electrical isolation procedure is to turn off all equipment with the normal stopping procedure and then open the main disconnect switch. Then remove the fuses and/or disconnect the wires from the source for the piece of equipment that is to be serviced.

   c) If the equipment is supplied from a breaker or switch, then simply turn off such supply and provide a means of locking it out.

   d) If working on control voltage devices such as pressure switches, thermostats, time delays, etc. the power must be de-energized prior to servicing. If servicing is to be done while the rest of the panel is to be kept operating, it will be necessary to disconnect the wiring upstream from a terminal connection.

When isolating electric motors you should verify that the equipment will not start by completing the control circuit. After you are satisfied that the equipment is not capable of being restarted, open the control circuit once again. This is most often accomplished by turning a selector switch to off. As an added precaution, you can also trip an electrical safety such as a high-pressure switch. Test the system with a certified voltage test indicator to ensure that all components are de-energized and de-activated, including interlocking or dependent systems which could feed into the system being isolated, either mechanically or electrically. All electric motors and equipment with electrical components, whether permanently installed or portable, must be grounded after verifying that not potential difference is present. **That is, check for both line voltage and phase to ground voltage. After ascertaining that no electrical potential exists (by use of an approved meter), short the wires or conductors to ground.** Use caution with systems that employ power factor (or other) capacitors to the circuit. Capacitors can store lethal DC charges even if no AC potential difference is applied. If said voltage is not present, it is recommended that the de-energized electrical system be discharged by short circuit and phase to ground before touching any exposed wiring or conductive components. Restore the unaffected equipment to normal operation.

4) <u>Apply Lockout</u>

All equipment capable of being electrically energized or dynamically (i.e. mechanically or automatically) activated must be de-energized or de-activated by locking out, physically disconnecting or other wise rendering the equipment inoperable. Switches, power sources, controls, interlocks and other such devices must be appropriately tagged and personally locked out by each worker involved in the operation. This can be accomplished by installing a “multi-hole safety” hasp and your Prairie HVAC issued lock and tag.

In cases where proper lockout is established but another individual requires access to the affected area (i.e. stationary engineer) after you have completed work for the day, then you may remove your lock provided it is safe to do so. It would only be considered safe if some other means to prevent harm were provided by the customer. (I.e. the customer provided his own lockout and/or procedure) If you have locked out an individual motor from a MCC disconnect, the customer will not need access to the starter. In situations where you have pulled the fuses from a panel and restored power to the rest of the panel, some additional considerations must be made for the customer if deemed necessary or requested. In such cases, install your “issued” lock and tag after the customer has installed their own lock and tag to your mutli-hole safety hasp. When you leave the job site, remove your lock and explain to the customer the importance of not eradicating the lockout procedure by reinstalling the fuses of the disabled or serviced equipment. Before starting work on the affected equipment each time you return to the job site, you must verify the above lockout precautions are in place before re-installing your issued lock and performing your services. **If no one else requires access to the affected area, DO NOT REMOVE YOUR LOCK.**

5) <u>Observe the Following Safeguards for Locking-Out and Tagging</u>

a) After the circuit has been de-energized and locked out by the person in charge, you must be protected by personally placing your own safety lock on the disconnect device. The key for your lock must be retained on your person while your lock is in place.

b) Where several workers or trades are working on the circuit, provision for additional locks must be made through the use of multi-hole safety hasps. This arrangement can accommodate any number of locks by placing another hasp in the last hole of the previous one.

c) In accordance with the current Regulations for Construction Projects, and the current Regulations for Industrial Establishments, each worker must securely attach his or her own lock and a durable tag filled out with at minimum the following information:

i) His/her name
ii) The date that the lock out was initiated and,
iii) The reason why the switch has been opened and locked out.

d) You must recognize that, even though the disconnect switch may already be locked; you are not protected until you attach your personal safety lock.

e) Never leave any exposed conductors uncovered. Conductor ends should always be taped or covered with wire nuts even if they are disconnected upstream and appear to pose no possible threat.

6) <u>Record the precaution Taken</u>

A record must be kept of all switches, power sources, controls, interlocks, pneumatics, hydraulics, computer controlled sources, robotics or other such devices opened, locked off or otherwise rendered inoperable so that all of these can be reactivated once work is completed.

7) <u>Tag the System</u>

Signs must be placed on the system indicating that it is not to be energized or operated and that all safeguards, including locks and tags are not to be tampered with or removed until work is complete.

8) Re-Energizing

When all work has been completed, remove your tags and locks in preparation for re-energizing. If there are no other worker lockout hasps are attached to the system you may proceed with any wire connection, fuse installations, energizing switches or breakers. This process will include the use of rubber matting, protective electrical gloves, adequate footing, and face shielding as in the shut down process. When re-energizing a main disconnect switch it is most important to stand to one side in the event of an unforeseen short, which can result in severe personal injury.

Add to previously recorded documentation that reflects completion of work and that all switches, power sources, controls, interlocks, pneumatics, hydraulics, computer sources, robotics or other such devices, have been brought back on line.