



## PALM BEACH STATE COLLEGE PERSONAL PROTECTIVE EQUIPMENT (PPE) JOB HAZARD ASSESSMENT

<b>Department:</b> Facilities	<b>Campus:</b> All
<b>Task:</b> Check/Service/Maintain/Repair/Install HVAC Equipment and Systems	
<b>Job Title(s) Performing Task:</b> A.C. Mechanic, A.C. & Energy Management System Specialist, Maintenance Mechanic, Maintenance Worker	

*Reviewed by David Olerich, A.C. & Energy Management System Specialist, July 23, 2015*

Task Step/Sub-Tasks	Hazard(s)	Recommended PPE (Bolded)/Controls
1. Utilize ladder or aerial lift device as necessary to access HVAC equipment. See also JHA "Use a Ladder" and JHA "Operate an Aerial Lift Device".	Falls from height	Ladder Safety training
		Use <b>Personal Fall Arrest System</b> when using aerial lift device.
2. Open/close equipment door/panel.	Cuts (from sharp metal edges)	Wear <b>work gloves</b> .
3. De-energize circuit serving the HVAC equipment/system following LOTO procedure (see pages 3 – 5).	<ul style="list-style-type: none"> <li>Electrical shock</li> <li>Compression (from pinching due to moving parts)</li> <li>Burns (from arc flash)</li> </ul>	Lockout/Tagout (LOTO) training
		Locate electrical panel and switch off and lock out appropriate circuit breaker following LOTO procedure (attached).
		Wear <b>work gloves</b> .
		Wear <b>safety glasses</b> .
		Stand to one side of panel and look away from switch when opening it.
4. Check filter(s) and replace as necessary.	None	None
5. Inspect belt(s) and adjust or replace as necessary.	Compression (from pinching due to moving parts)	Ensure equipment is locked out. Wear <b>work gloves</b> .
	Ergonomics (back or other strain from using wrenches or other tools to disassemble/assemble equipment)	Do stretching and warm-up exercises before starting work.
	Impact/Cuts (from slipped wrench, resulting in striking of fingers/hand against equipment)	Wear <b>work gloves</b> . Use proper, well-maintained hand tools.
6. Inspect bearings and lubricate as necessary.	None foreseen	N/A
7. Add refrigerant as necessary	Extreme cold	Wear <b>work gloves</b> .

Commented [LLL1]:

Commented [LLL2]:



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8. Inspect coils and clean as necessary.	Chemical exposure	Use "green" product. Wear <b>vinyl/nitrile gloves</b> , chemical <b>splash goggles</b> or <b>respirator</b> as per product Safety Data Sheet.
9. Turn on circuit breaker following LOTO procedure (see pages 3 – 5).	Burns (from arc flash)	Wear <b>work gloves</b> .
		Wear <b>safety glasses</b> .
10. Turn on HVAC equipment/system to ensure it is re-energized.	None foreseen	N/A

**NOTE:** Basic hazard categories include – **impact** (falling/flying objects, struck by), **falls from height**, **penetration** (sharp objects piercing foot/hand, other body parts), **compression** (roll-over or pinching), **cuts, burns, chemical exposure** (inhalation, ingestion, skin contact, eye contact or injection), **heat, extreme cold, harmful dust, noise, light (optical) radiation** (welding, brazing, cutting, furnaces, etc.), **ionizing radiation, non-ionizing (RF energy) radiation, electrical shock, ergonomics** (includes back strain or other strain due to lifting/stretching) and **biologic**.

**CERTIFICATION:** I certify that I have personally performed the above Job Hazard Assessment on the date indicated below. *This document is a Certification of the Hazard Assessment required by 29 CFR 1910.132(d)(2).*

Larry L. Leskovjan	<i>Larry L. Leskovjan</i>	July 23, 2015
<b>Printed Name</b>	<b>Signature</b>	<b>Date</b>



## PALM BEACH STATE COLLEGE LOCKOUT/TAGOUT PROCEDURE

**APPLICABILITY:** The requirements for lockout/tagout do not apply at the College to servicing and maintenance of cord- or plug-connected electric equipment for which exposure to the hazards of unexpected energization or start-up is controlled by unplugging the equipment from the energy source and by the plug end being under the exclusive control of the employee performing the work at all times.

Similarly, the requirements for lockout/tagout do not apply when a single switch controls a single energy source for operation of the machine or item of equipment, which is completely de-energized when this switch is in the "off" position, and which is under the observation and control of the authorized employee at all times while servicing and maintenance is being performed. If the authorized employee relinquishes observation and control of this switch (e.g., leaves the work area for any length of time), lockout/tagout devices must be employed to ensure that this switch is not activated while the employee is absent.

However, a written procedure for lockout/tagout does not have to be developed if the machine has only one energy source that is easy to identify, that completely shuts down the unit when shut off, that can easily be locked out during repairs and for which there is no potential for stored energy. Otherwise, the written lockout procedure established below shall be followed.

**WRITTEN LOCKOUT PROCEDURE FOR:** All machines or items of equipment powered by electricity, hydraulic or pneumatic energy (e.g., fluids, gases or steam) or mechanical energy (e.g., gravity activation or stored in springs), which shall be required when none of the exceptions noted above apply.

**PURPOSE:** This procedure establishes the minimum requirements for the lockout of energy-isolating devices whenever servicing or maintenance is performed on the machine(s) or item(s) of equipment for which a written lockout procedure is required. It shall be used to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before authorized employees perform any servicing or maintenance where the unexpected energization or start-up of the machine or item of equipment, or release of stored energy from it, could cause injury.

**COMPLIANCE:** All employees are required to comply with the restrictions and limitations imposed upon them during the use of lockout. Lockout shall be performed in accordance with this procedure only by authorized employees. All employees, upon observing a machine or item of equipment that is locked out to perform servicing or maintenance, shall not attempt to start, energize or use that machine or item of equipment. Employees failing to observe the lockout/tagout procedures may be subject to disciplinary action in accordance with College policies.



#### SEQUENCE OF LOCKOUT:

**Step 1:** Verbally notify all affected employees (those whose job requires use of a machine or item of equipment being locked or tagged out or who may be in or near the immediate work area) that servicing or maintenance is required on the machine or item of equipment and that it will be shut down and locked out to perform the work. Affected employees could include any other Facilities employees who are working or happen to be in the area, as well as the area's normal occupants.

**Step 2:** Identify the type and magnitude of energy source(s) that the above-named machine or item of equipment uses through reference to its operating manual, PM procedure, etc. Ensure that you know the methods to control its energy.

**Step 3:** If operating, shut down the above-named machine or item of equipment by using the normal stopping procedure (i.e., depress its stop button, open its switch, close its valve, etc.).

**Step 4:** De-activate the energy-isolating device(s) for the machine or item of equipment by opening its circuit breaker(s), employing its disconnect switch(es), closing its line valve(s) or otherwise blocking the transmission or release of energy to it.

**NOTE:** Particular care must be taken to ensure that machines or items of equipment powered by multiple electrical circuits have had all circuit breakers opened. This is especially critical when working in junction boxes, which typically contain multiple circuits. In addition to opening all circuit breakers, a properly working circuit tester (employees should test it on a known live circuit before use) must be used to confirm that there are no live circuits before proceeding to work on the equipment.

**Step 5:** Apply the lock(s)—lock out the energy-isolating device(s) with assigned individual lock(s). Apply tags if appropriate.

**Step 6:** Dissipate or restrain all stored or residual energy (e.g., in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems and air, gas, steam or water pressure, etc.) by grounding, repositioning, blocking, bleeding down, etc.

**Step 7:** Check that no personnel are working on or in the machine or item of equipment and that all are clear.

**Step 8:** Verify that the machine or item of equipment is isolated (disconnected) from its energy source(s) by operating the normal operating control(s) to ensure that it will not operate (or is at a zero energy state); i.e., turn it on to see if it operates.

**Step 9:** Return the operating control(s) activated during the isolation verification in Step 8 to the "off" or neutral position if the machine or item of equipment does not respond. Otherwise, re-trace the previous steps and repeat them until it no longer responds when turned on.



**Step 10:** The machine or item of equipment is now locked out.

**RESTORING THE MACHINE OR ITEM OF EQUIPMENT TO SERVICE:**

When the service or maintenance is completed and the machine or item of equipment is ready to return to normal operating condition, the following steps shall be taken:

**Step 1:** Ensure that the work is completed and that the machinery or equipment components are operationally intact. The tools and equipment that were used are to be inventoried and removed.

**Step 2:** Remove all towels, rags, work-aids, trash, etc.

**Step 3:** Replace guards as necessary. Sometimes a particular guard may have to be left off until the start sequence is completed due to possible adjustments. However, all other guards should be put back into place. After final check out, all guards should be in place.

**Step 4:** Check the work area to ensure that all employees have been safely positioned or removed.

**Step 5:** Verify that all controls are in a safe ("off") or neutral position.

**Step 6:** Remove locks/tags. Remove only your lock or tag.

**Step 7:** Re-energize the machine or item of equipment. *Note:* The removal of some forms of blocking may require re-energizing of the machine or item of equipment before safe removal of the locking devices. Use extra caution.

**Step 8:** Notify affected employees that the service or maintenance is completed and that the machine or item of equipment is ready for use.