

## **SECTION 01 93 10 - EQUIPMENT SPECIFIC ENERGY CONTROL PROCEDURES (LOTO)**

### **1. GENERAL**

- A. Equipment-specific energy control procedures are an OSHA requirement and designed to prevent injuries to employees from the unexpected energization or startup of the equipment or related systems, or the sudden release of stored energy within the equipment, or any other potentially hazardous energy sources.
- B. Provide new (or updates to existing) equipment-specific energy control procedures for all equipment with hazardous energy sources installed or replaced under a project, including if a project is new construction, a “gut” renovation to an existing building, the installation of new or an upgrade/replacement of existing equipment within an existing facility.
- C. Brown will use these procedures as a set of “living documents” over the long term to safely service this equipment in compliance with the latest standards of:
  - OSHA – 29 CFR 1910.147 The Control of Hazardous Energy (Lockout / Tagout)
  - OSHA – 26 CFR 1926.417 Lockout and Tagging Circuits
  - NFPA 70E Standards for Electrical Safety in the Workplace
  - ANSI/ASSE Z244 The Control of Hazardous Energy Lockout, Tagout and Alternative Methods
  - Brown University Control of Hazardous Energy – Lockout / Tagout Program.

### **2. EQUIPMENT SPECIFIC ENERGY CONTROL PROCEDURES(LOTO)**

- A. The equipment-specific procedures shall identify the individual piece of equipment and associated energy control procedure. The procedure shall include:
  - A description of the equipment, equipment location and asset ID if applicable;
  - Steps for shutting down, isolating, blocking and securing the equipment to control hazardous energy;
  - Steps for the placement of lockout devices;
  - Steps for testing equipment to verify zero energy state;
  - Steps for the proper equipment return to service, including any re-energization and return to automatic control from the building automation system.
  - The photos included in the procedure shall not be stretched in ways that affect the photo aspect ratio.
- B. An example Lockout Tagout Procedure is noted in Exhibit 1 – Sample Energy Control Procedure.
- C. Draft energy control procedures are to be reviewed and finalized with designated FM-Operations and / or EHS staff prior to installation.

### **3. DELIVERABLES**

- A. Excel (or other approved electronic medium) files for each final energy control procedure shall be identified using Brown's equipment asset ID tagging nomenclature, and turned over to FM-Operations at the completion of the work. An additional PDF copy of each energy control procedure shall also be provided, for incorporation into the University's Asset management system.
- B. A hard copy of each completed energy control procedure shall be laminated and attached to each item of equipment. For equipment installed outdoors or in wet environments, tags shall be made of flexible, 1/8" white Sintra panel, with 1" radius corners and 3/8" dia. hole, nominally sized 8.5 x 11" The energy control information shall be effected to the tags by a direct silk-screen process.

### **4. TAGGING AND LABELING:**

- A. Equipment, valve and electrical component labeling shall be provided as detailed in Brown University Facilities Management Standard 01 70 10 MEPFS Identification & Labeling.
- B. Additional valve labeling and tagging for energy control shall be 2" x 2" yellow aluminum round tag and utilize the 2-line nomenclature consistent with the above noted Standards section.

## EXHIBIT 1 – SAMPLE ENERGY CONTROL PROCEDURE



### LOCKOUT TAGOUT PROCEDURE

Description: Condenser Water Pump 2			
Location: VGQ Mechanical Rm 014	Rev.: 0	Rev. Date: N/A	Origin Date: 5/03/2022
Asset ID 061PUCDWTR-002	Review Date:		

#### Shutdown / Startup Procedure:

Purpose of the LOTO is protect personnel from hazardous energy while service or maintenance is conducted on the pump. In the BAS place pump in the disabled or unoccupied position. Then shut down the pump by depressing off button on VFD 2 controller, closing inlet valve, outlet valve and open drain valve CWP-2 DV-1. To place it back in service close drain valve, open outlet valve and then inlet valve. Press the on button located on VFD 2 controller, then re-enable the pump in BAS.



#### ALWAYS PERFORM A MACHINE STOP BEFORE LOCKING OUT DISCONNECTS

ID	Source	Location	Method	Verify zero energy	LOTO Device
Pump P-2 VFD	Electrical 480V	Disconnect switch is located on front of P-2 VFD controller.	Move VFD P-2 disconnect switch to off. Lock out.	Attempt restart at Control Panel. Verify zero energy with a meter.	Lock
CWP-2 IV-001	Valve	Valve is located suction side of pump.	Close CWP-2 IV-001 valve. Lock out.	Verify zero pressure on discharge side gauge.	Butterfly Valve Lockout
CWP-2 IV-002	Valve	Valve is located discharge side of pump.	Close CWP-2 IV-002 valve. Lock out.	Verify zero pressure on discharge side gauge.	Butterfly Valve Lockout
CWP-2 DV-1	Drain Valve	Drain valve is located on suction side of pump at ground level.	Open CWP-2 DV-1 valve.	Verify pressure has bled off.	Tag

**DANGER**

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***Safety Is Your Responsibility!***

End of Section