Caliper Water SAFETY.

Your Facility

Emergency SOPs

Illustrations and Notes arranged by
Sedley Parkinson, Instructor

Dec. 2020

Contents

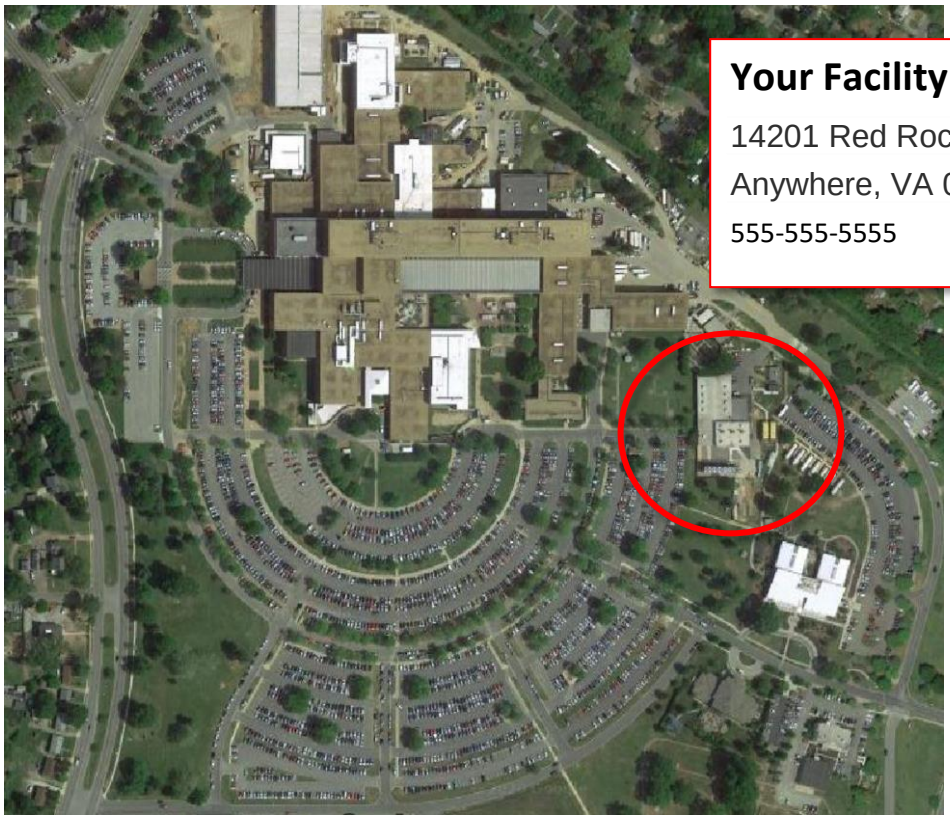
1) Emergency Call Sequence

In the event of an emergency call the following in sequential order:

Note

A. If contact is not available (i.e. does not answer phone), call next in line
B. When contact is made and after informing situation, ask contact if you should call next in line

1. Utility Plant Supervisor, **x6213**
2. Maintenance and Operations (M&O) Foreman, **x5505**
3. Chief Engineer, **x5168**
4. Medical Facility Associate Director, **x5500**
5. Hospital Main Telephone Operator, **x0**



Your Facility Center

14201 Red Rock Blvd.
Anywhere, VA 00009
555-555-5555

2) Loss of City Water to Boiler Plant

1. Using hydrant wrench, remove 2 ½ inch side cap on hydrant.

2. Placing hydrant wrench on top nut, turn counter-clockwise to open and briefly flush. Reclose.

3. Using appropriate adapter, connect first fire hose to opened 2 ½ inch tap on hydrant. Do not open hydrant at this point.

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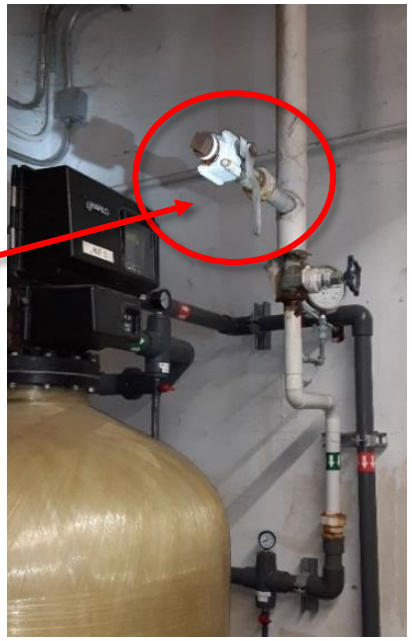
2) Loss of Water to Boiler Plant *(continued)*

4. Connect opposite end of first fire hose to second fire hose.



5. Bring opposite end of second fire hose to emergency water inlet tap upstream of water softener.

6. Confirm valve to tap is shut. Remove plug.

7. Using appropriate adapter, connect second fire hose to emergency water inlet tap.

8. Open tap valve. Open Hydrant using hydrant wrench on top nut.

9. Execute **SOP 1) Emergency Call Sequence**

10. Lockout/tagout affected equipment. Record situation in logbook.

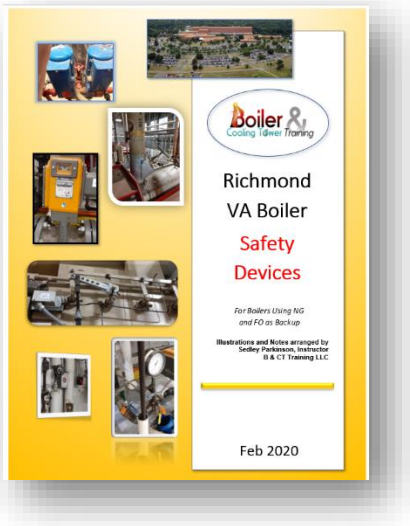
3) Boiler Safety Device Failure

1. If applicable, start standby boiler to ensure continued steam service. (Safety Devices on DA and Condensate tanks do not affect standby boiler)

2. Determine cause of safety device trip.

3. If possible, correct issue.

4. If condition is corrected, perform test as per **Safety Devices Testing Manual** to confirm operation has been returned to normal. Contact Utility Plant Supervisor via email describing repair. Note situation in log.



5. If condition cannot be remediated, Execute **SOP 1) Emergency Call Sequence**

6. Lockout/Tagout affected equipment. Record situation in log book.

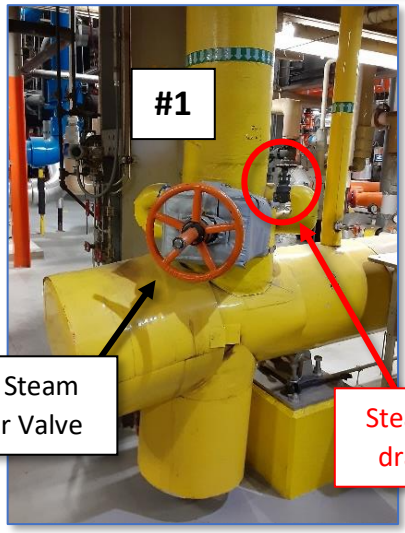
4) Boiler Enters Dry Fire

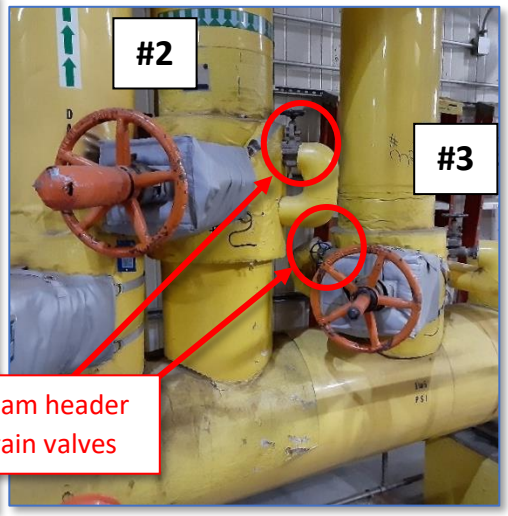
Active Boiler: Water Level drops out of sight glass view

1. Press **Emergency Stop** on boiler in Dry Fire condition.

2. Close feedwater valve to boiler.

3. Close steam header valve from boiler in question. Open steam header drain valve which will slowly relieve any residual boiler pressure.
4. Activate standby boiler to maintain steam to hospital.





5. Execute **SOP 1) Emergency Call Sequence**

6. LOCKOUT / TAGOUT dry fired boiler. Record situation in logbook

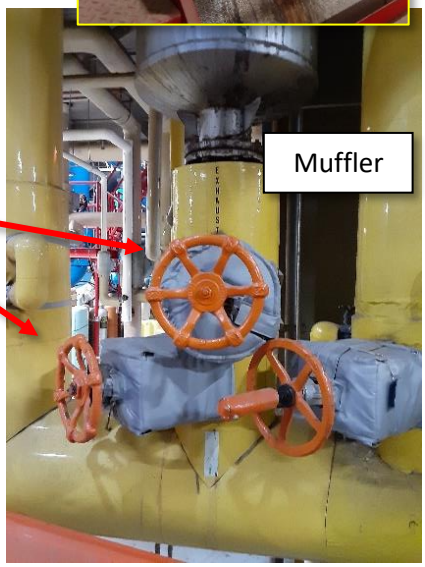
5) Major Steam Leak

1. Determine severity and location of steam leak.

2. If leak is manageable and leak is located on steam line after steam header (such as to domestic hot water heat exchangers), isolate leak on steam line after steam header.

3. For any other leak, press active boiler's **Emergency Stop**

4. If leak is manageable and on the steam line between boiler and header, then close boiler's main steam line **non-return valve** feeding leak. Boiler's safety valve may temporarily lift. Activate standby boiler to maintain steam supply to hospital.



5. If leak is manageable and on steam header. Open both Muffler Valves on steam header.

6. If leak is not manageable, press any **Emergency Full Stop Button** in control room or any exit which shuts down all boilers while evacuating boiler plant.

7. For all major steam leaks, execute **SOP 1) Emergency Call Sequence**

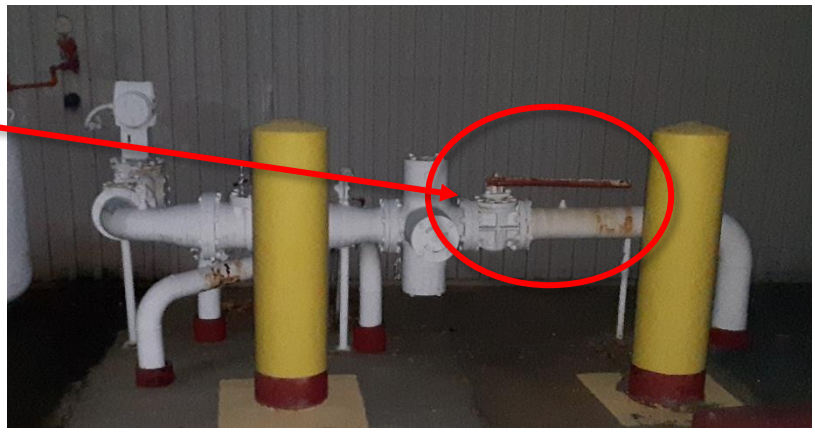
8. After steam leak subsides, Lockout/Tagout affected steam valves and equipment. Record situation in log book.

6) Major Gas Leak/LEL Alarm

1. For any major gas leak inside of boiler plant, either smelled by an operator or detected by automatic Combustible LEL > 10% alarm, press any **Emergency Full Stop** in control room or at any exit.

2. Evacuate Boiler Plant.

3. Close **Natural Gas manual main shutoff valve** on main line feeding plant outside of building.



4. Execute **SOP 1) Emergency Call Sequence**

5. After alarm stops, Lockout/Tagout any affected equipment.

6. Record situation in logbook after ‘all clear’ is announced

7) Carbon Monoxide (CO) Alarm





1. Determine source of the Carbon Monoxide gas.

2. If possible, remediate source of carbon monoxide (such as a running vehicle exhaust entering building), when alarm silences, enter information in log. No further action required.

3. If source cannot be determined or quickly remediated and levels are greater than 50 ppm, THEN:

   a. Press nearest EMERGENCY FULL STOP in control room or at any exit

   b. Evacuate Building

   c. Execute **SOP 1) Emergency Call Sequence**

   d. After 'All Clear' is announced, Lockout/tagout any affected equipment.

   e. Record situation in logbook

8) Refrigerant Leak

1. Identify which Refrigerant Leak Alarm is sounding and to which level
   a. **Caution**
   b. **Warning**
   c. **Alarm**

2. If "**Alarm**" is sounding, confirm emergency refrigerant exhaust fans have activated and are operating by placing a piece of paper in front of each of 3 air intakes and observe air flow.



3. Execute **SOP 1) Emergency Call Sequence**

4. Lockout/Tagout any affected equipment. Record situation in logbook.

9) Chiller Surge

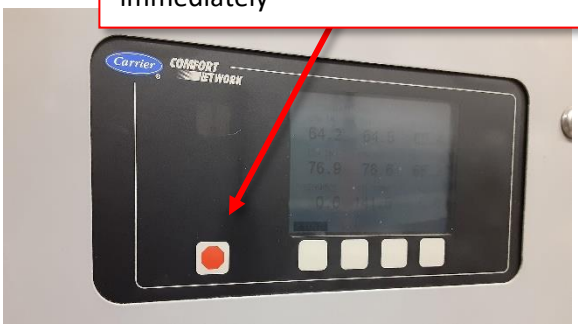
1. If possible, determine the nature of the surge and correct the issue.

Possible Causes:

- Poor water circulation to cooling tower: plugged filters, pump failure
- Cooling tower fan failure
- Scale and or biological growth build-up in condenser (no heat transfer)
- Heavy fouling in cooling tower media (cooled water not being produced)
- In some extreme cases, the evaporator has gotten too cold and forms a vacuum (example: chilled water demand drops suddenly)

2. If problem cannot be diagnosed and/or remedied in a timely manner, shut down surging chiller.

Pressing **Estop** once forces chiller to go through routine stop
Pressing **Estop** twice, shuts it down immediately



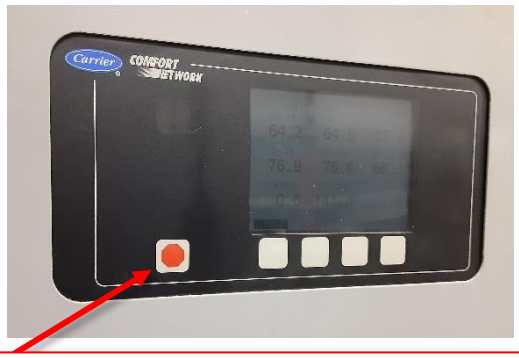
3. If necessary, start standby chiller.

4. If active chiller capacity is compromised, execute **SOP 1) Emergency Call Sequence**

5. Lockout/tagout affected equipment. Record situation in logbook.

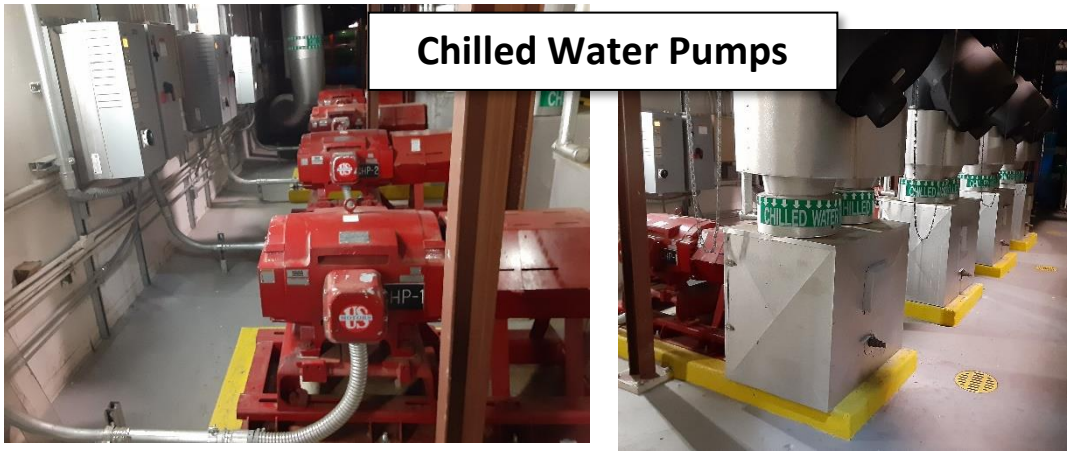
10) Major Chilled Water Leak

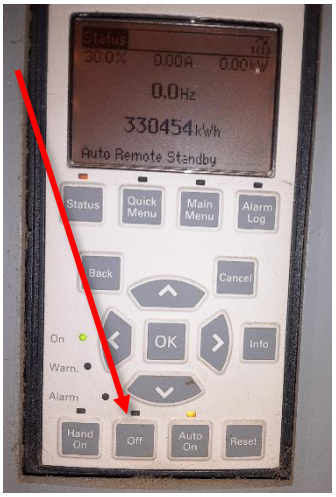
1. Shut down all online chillers



Pressing **Estop** once forces chiller to go through routine stop
Pressing **Estop** twice, shuts it down immediately

2. Shut down all chilled water pumps





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10) Major Chilled Water Leak *(continued)*

3. Shut down all condenser pumps
    a. First Row closest to Control Room

Press **HOA** twice,

1st press: display shows **OFF**,

2nd press: display shows **Hand**.

Then Press red **STOP/reset** button.

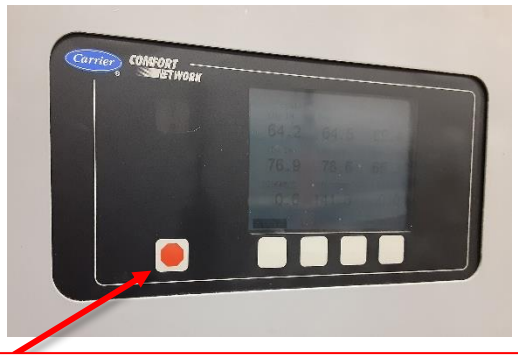
b. Shut down second row of condenser pumps

4. Execute **SOP 1) Emergency Call Sequence**

5. Lockout/Tagout affected equipment. Record situation in logbook.

11) Major Condenser Water Leak

1. Shut down all online chillers



Pressing **Estop** once forces chiller to go through routine stop
Pressing **Estop** twice, shuts it down immediately

Press **Estop** twice

2. Shut down all condenser pumps
    a. First Row closest to Control Room

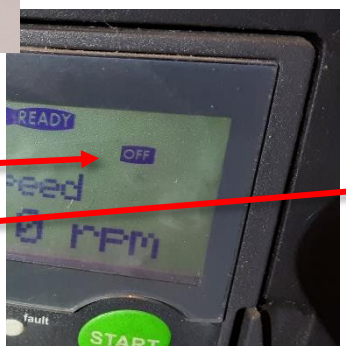
1st Row

Press **HOA** twice,

1st press: display shows **OFF**,

2nd press: display shows **Hand**.

Then Press red **STOP/reset** button.



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11) Major Condenser Water Leak *(continued)*

b. Shut down second row of condenser pumps

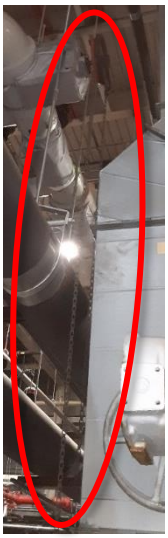
3. Isolate cooling tower water supply from cooling towers (stop the flow).

4. Execute **SOP 1) Emergency Call Sequence**

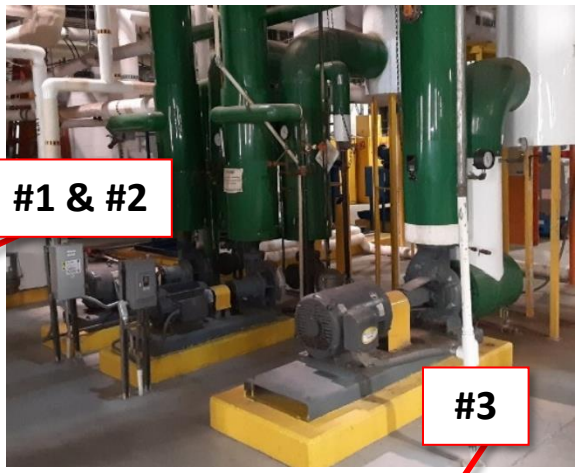
5. Lockout/Tagout all affected equipment. Record situation in logbook.

12) Reheat Water: Over Temperature or Pressure

1. Using chains, shut appropriate steam supply valves to isolate affected heat exchanger(s).



2. Turn off Reheat Water circulation pumps.

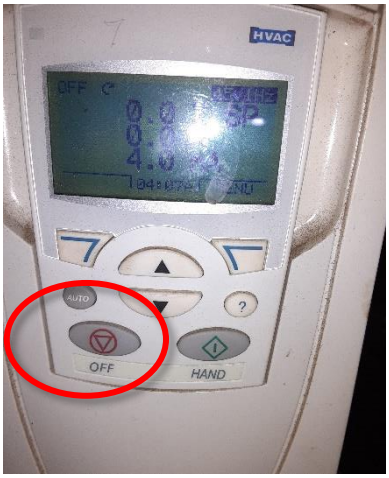


3. Execute **SOP** **1) Emergency Call Sequence**

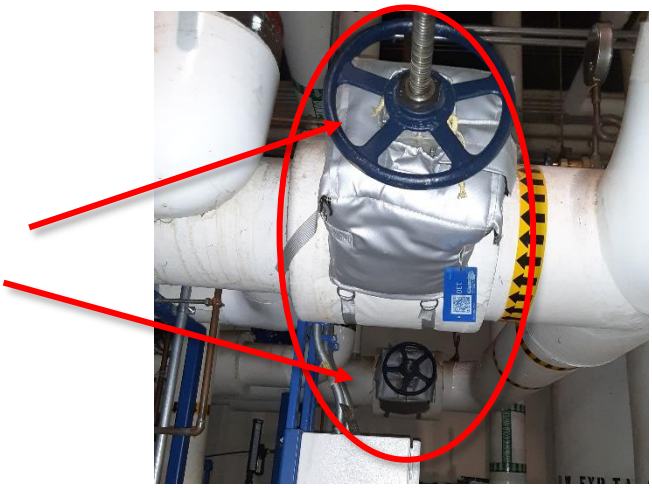
4. Lockout/Tagout all affected equipment. Record situation in logbook.

13) Domestic Hot Water: Over Temperature/Pressure

1. Using VFDs, turn off all hot water pumps serving Over Temperature/Pressure condition.



2. Close any steam supply valves serving Domestic Hot Water system in Over Temp./Pressure condition.

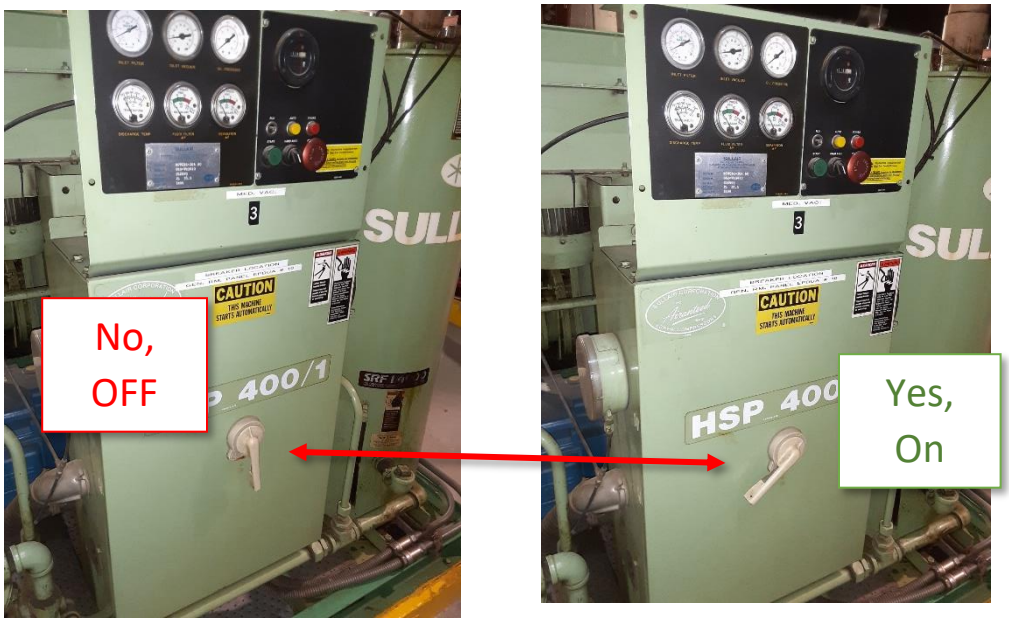


3. Execute **SOP** **1) Emergency Call Sequence**

4. Lockout/Tagout all affected equipment. Record situation in logbook.

14) Vacuum System Low Alarm

1. Manually activate lag vacuum:
   a. Ensure main switch is at an angle (On)



   b. Pull out red Emergency Stop button out to start

2. Execute SOP 1) Emergency Call Sequence

3. Record situation in logbook.

15) Medical Air Low Pressure Alarms

1. **LOW COMPRESSED AIR**: Change unit in “LAG” to “LEAD”

2. Air Compressor should automatically start, if not, press green “Start” button

3. Other gas alarms (Oxygen, Nitrous Oxide, Nitrogen, Carbon Dioxide), call plumbing shop **x3834**
   Second, identical annunciator is located at Main Switchboard Operator

4. If situation cannot be remediated by following the steps above, then: Execute **SOP 1) Emergency Call Sequence**

5. Record situation in logbook

16) E-Generator Non-Auto Start During Outage

1. On Emergency Generator interior control panel, insert Emergency Generator key into Transfer test keyhole. Turn to "**Load Gen**" (for Utility Plant).

2. Press yellow "**Transfer Initiate**" button. Generator will go through automatic start sequence and sync electricity to utility plant.

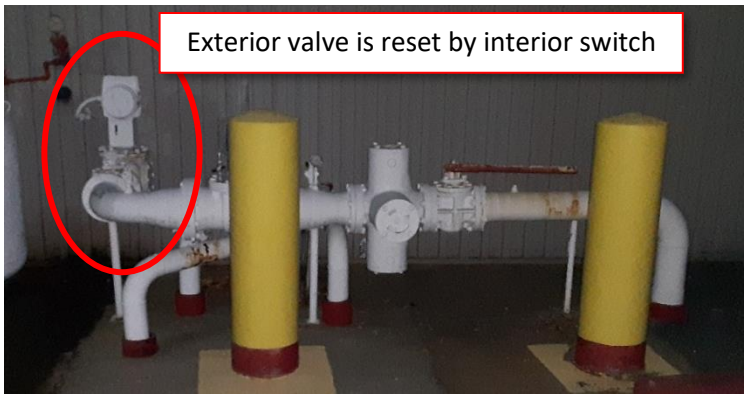
3. If generator still did not start, then:

   Execute **SOP** **1) Emergency Call Sequence**

4. Record situation in logbook

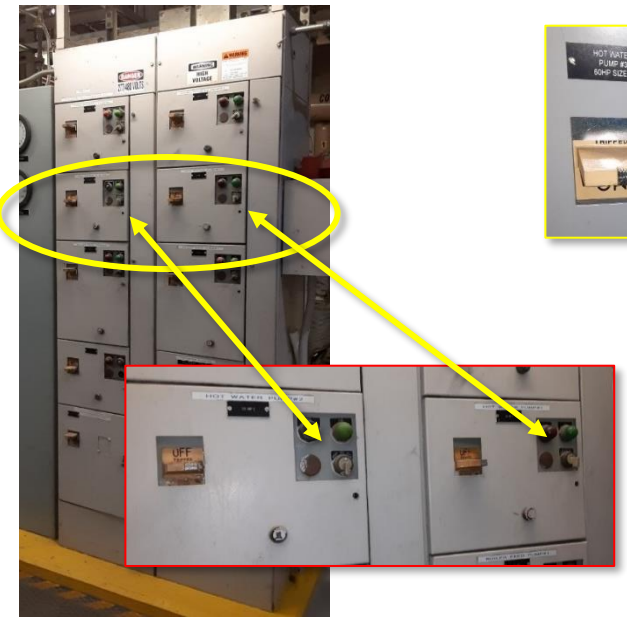
17) Power Outage Recovery Checklist

1. Reset main gas valve



2. Verify Boiler Feed Water and Condensate Pumps automatically restart

3. Verify Hot water reheat pumps automatically restart.
   Both #1 AND #2, <u>OR</u> only #3



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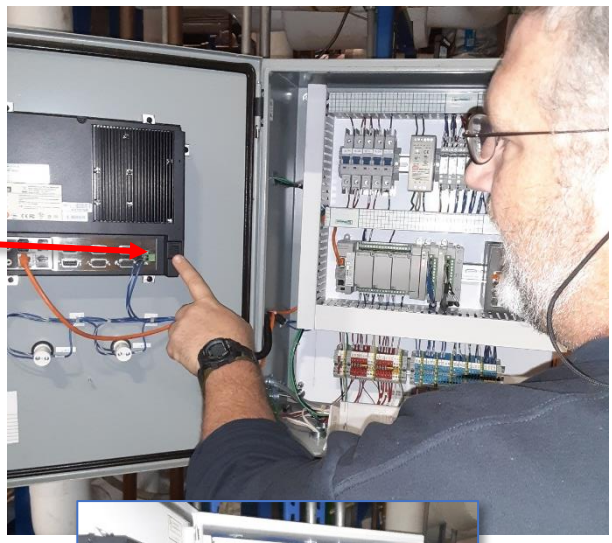
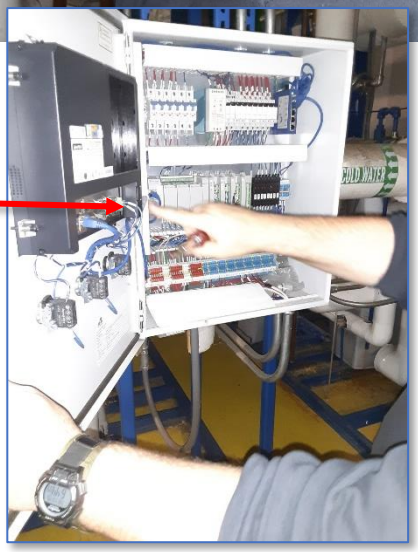
17) Power Outage Recovery Checklist *(continued)*

4. Restart Boiler(s)
   a. Confirm burner to “On”

   b. Push “Reset” button on Honeywell burner control
   c. Restart Boiler
   d. To save time: ***Continue with Steps 5 through 9 as boiler advances through startup sequence***

5. Push Reset buttons inside of control panels for Domestic Hot Water Skids. Pumps will restart automatically.

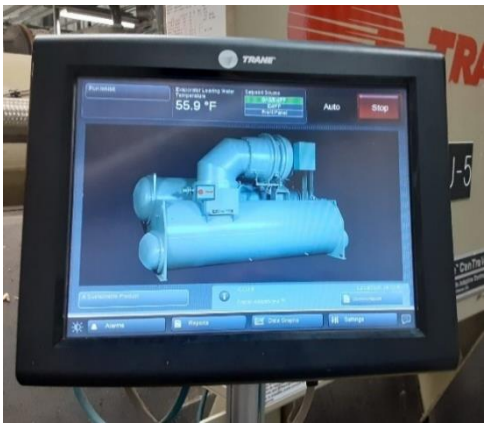




6. Check Vacuum pumps and Med Gas Compressors. If they do not restart automatically, refer to **Emergency SOP 14)** and/or **15)** *AFTER* completing **Power Outage Recovery Checklist**.

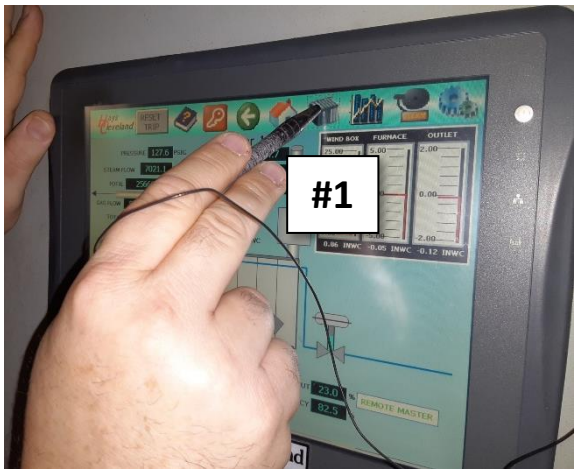
7. Verify chiller condenser and chilled water pumps restarted automatically

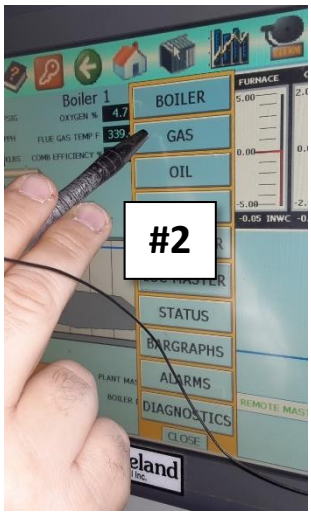
8. Restart Chiller(s)



9. Verify Control Air compressor restarted automatically

10. Return to boiler: On Hays Cleveland Control Screen
    Use stylus to activate **Boiler icon (#1)**, **Gas button (#2), Etc.**
    Continue and complete normal boiler startup.





Etc.

11. If any of the above equipment did not successfully restart, then:

    a. Execute **SOP 1) Emergency Call Sequence**

    b. Lockout/Tagout all affected equipment.

12. Record situation in logbook.