



Facilities Management Procedure

Weber State University

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Standard Operating Procedures for Steam Distribution

Description:

This document establishes the procedure for steam distribution and operations for the Ogden campus of Weber State University.

References:

Steam Distribution Guide

Responsible Party:

Facilities Management Heat Plant Operators

Procedure:

The following procedure will allow sustainable maintenance for the steam distribution system used by Weber State University:

A. SHUTTING ISOLATION (MANUAL OPERATE) VALVE FOR LOCALIZED MAINTENANCE

1. Procedure

Identify isolation valve(s) that need to be isolated for work.

Radio call Heating Plant operator with the following information:

- Your work location
- Valve description

- Valve identifier if available

The Heat Plant operator will make a log entry and notes on distribution map of maintenance on specific valves.

Perform lockout / tag out (LOTO) procedures.

SLOWLY close the valve.

Radio call Heat Plant with valve status.

Note the condition of valve once it is closed and make a call to the Heat Plant operator

- Check for leaks
- Heat Plant operator will make log entry and mark on tracking map

LOTO valve per EH&S procedure

- Radio call Heat Plant with LOTO information

SLOWLY crack open up stream bleed valve downstream of the isolation valve to bleed off pressure

- Once pressure is reduced to safe level open valve to drain condensing steam

Radio call to Heat Plant operator that the bleed valve is open

B. STEAM SYSTEM SHUTDOWN

1. Prep and set up

Pull all work orders that are held for shutdown

- Take pictures of needed repairs
- List needed materials for repairs

Prior to shutdown of main steam system, start auxiliary boilers and bring on line

Set date for practice drill and run through below process before doing actual work

- Identify time line and expected time to conduct evolution

Set date for shutdown

Schedule personnel for evolution

- Two tunnel workers with radios – valve operators
- Heat Plant operator with radio
- One work team supervisor in Heat Plant with map, record log, and check list with radio
- Safety observer at entrance with radio

Arrange needed materials

- Full size steam and condensate drawings with valve identification and locations which will be retained for records.

- Two sets of half size steam and condensate drawings with valve identification and locations
- Log book
- Tag Out Log
 - Tags with tag count
 - Zip ties
- Note taking material
- PPE kit (2)
 - Flashlight
 - Hard hat
 - Safety vest
 - Gloves (high heat)
 - Eye protection
 - Water bottle
 - Appropriate clothing
- Charged radios – (5) each person needs a call name for evolution

2. Start of evolution and working day until evolution secures

On date of shutdown, gather Heat Plant personnel and conduct safety meeting

- a. All personnel working evolution will have needed equipment
- b. Gather at Heat Plant each day for evolution for safety meeting and re-group at the end of working day for debrief until evolution is secured.

LOTO all off line steam generators.

Lower Heat Plant operating pressure to 60 PSI.

Send valve operators to first location to begin evolution.

3. Valve cycling

Identify valves that will be closed (starting at Stage 1 valves, continue process to close all stages).

Radio call team supervisor and reference which valve is being cycled. The team supervisor will make the log entry and mark on the tracking map.

SLOWLY close the valve.

Radio call team supervisor with valve status.

Tag valve per EH&S procedure.

Radio team supervisor with tag information and record on Tag Out log.

SLOWLY crack open downstream bleed valve from the isolation valve to bleed off pressure.

Once pressure is reduced to zero, open valve to drain condensing.

Tag valve is open for maintenance and radio call team supervisor with valve condition.

Team supervisor will record valve condition on Valve Tracking log.

Radio call to team supervisor that you are moving on to the next valve.

Repeat until system is isolated.

Re-group at the Heat Plant for debrief at end of working day before system is off.

4. *Boiler shutdown*

Once steam distribution system is isolated follow Boiler Start-Up Guide to shut down on line boiler and LOTO all steam generators.

Set firing controls to manual and drive to minimum fire.

Switch boiler to off and let controls cycle to turn boiler off.

Shut fuel isolation valves.

Monitor offline boiler is maintaining drum level until it has cooled completely.

Monitor DA and Condensate tanks to ensure they are maintaining level.

Once all steam generator have cooled shut off feed water and transfer pumps.

Set controls to manual and drive to "Closed."

Wet Lay-up process.

LOTO east drain line open (don't close until system is above 60 PSI).

5. *End of working day and end of evolution*

At the end of the work day before system is off, re-group Heat Plant personnel for debriefing.

C. STEAM SYSTEM START UP

1. *Prep and set up*

Set date for practice drill and run through below process without doing actual work.

Identify time line and expected time to conduct evolution.

Set date for start-up.

Schedule personnel for evolution.

- a. Two tunnel workers with radios (valve operators)
- b. Heat Plant operator with radio.
- c. One work team supervisor in Heat Plant with map, record log, and check list with radio.
- d. Safety observer at work entrance with radio

Arrange material needed

- Full size steam and condensate drawings with valve identification and locations/ (Will be retained for records)

- Two sets of half size steam and condensate drawings with valve identification and locations
- Log book
- Tag out log
 - Tags with tag count
 - Zip ties
- Note taking material
- PPE kit (2)
 - Flashlight
 - Hard hat
 - Safety vest
 - Gloves (high heat)
 - Eye protection
 - Water bottle
 - Appropriate clothing
- Charged radios (5)- each person needs a call name for evolution
- Shutdown log. (Reviewed prior to beginning work)

Before start-up clear all LOTO not on steam isolation valves or boilers

- Notify team supervisor
- LOTO on East steam run will be LOTO open by boiler operator

Line up system to provide steam

- Verify condensate is drained from steam lines
 - Isolation valves will be off and drain lines open tagged accordingly
- Open isolation valves and close drain valve
- Notify team supervisor via radio call

Gather Heat Plant personnel to Account for every tag

Resolve any missing tags

2. Start of evolution and work day until evolution secures

On date of start-up call a meeting for Heat Plant personnel and conduct safety meeting

- All personnel working evolution must have required equipment

Remove LOTO steam generators that will bring system online

3. Boiler start

At 7:00 am on scheduled date use Boiler start Up Guide to bring boiler online for warming

Using PLC inter face maintain boiler at low fire to warm boiler and system

- East steam line will be LOTO open. Don't close until system is above 60 psi

4. *During warm up*

During boiler warm up inspect system per boiler start up guide
Verify repairs are effective
Verify system is expanding as designed

5. *End of working day and end of evolution*

Gather Heat Plant for debrief
Gather the following morning for safety meeting
Make final inspection and re-gather Heat Plant personnel for final debrief
Heat Plant operator will bring plant up to pressure over the next three shifts