OPERATIONS DIVISION
STANDARD OPERATING PROCEDURE

OD/SOP 08.12 Freeze Protection Protocol

DATE: September 2, 2015

PURPOSE

This Operations Division Operating Policy and Procedure (OD/OP) establishes procedures to be followed in protecting equipment and facilities from damage during times of freezing weather.

REVIEW

This Operations Division Operating Policy and Procedure will be reviewed in October of each year by the Energy Manager, HVAC Superintendent, ELOM Foreman, Systems Maintenance Foreman, and Emergency Maintenance Supervisor. The Energy Manager will subsequently present it to the Energy Committee. It will then be approved by the Assistant Vice President for Operations.

POLICY AND PROCEDURE

1. Definitions

a. AHU: Air Handling Unit

b. Chilled Water Pump (CWP): Device used to pump chilled water through the cooling coil of the AHU.

c. Chilled Water valve: Device used to regulate the flow of chilled water through the cooling coil of the AHU.

d. Environmental Control Systems: Computers used to monitor and make adjustments to Air Handlers, Chilled Water systems, Hot Water systems, etc., in campus facilities.

e. Exceptions: Buildings or AHUs which require special procedures not covered in this Operating Policy. They will be listed on Appendix A, Exceptions.

f. FAB: Face and Bypass Damper. A damper which bypasses inlet air flow around the pre-heat coil.

h. Hot Water Pump (HWP): Device used to pump hot water to the heating coil of the AHU.
i. MAT: Mixed Air Temperature

j. Mixed Air Low Temperature Limit: (This is not a low limit alarm, this is from a space temp sensor).

k. OAD: Outside Air Dampers

l. OAT: Outside Air Temperature

m. Operator: The Emergency Maintenance Operator on duty.

n. Software Override (SWO): A command on the Front End Computer to change the state of a device in the field. The command must be manually released.

2. Procedures According to System Mode/Status

   a. When an AHU is running properly:
      No action will be taken on any AHU that is online and running properly.

   b. If an AHU transmits a MAT Low Temperature Alarm whether or not the AHU is running:
      1. Ensure the Heating Valve is 100% open. If not, issue a SWO to open it to 100%.
      2. If so equipped, override the Pre-Heat Valves open and the FABs open.
      3. Check the HWP indications and ensure it is running. If it is not, the Operator will issue a SWO to turn it on.
      4. Issue a SWO to override the Chilled Water Pump on and open the Chilled Water Valve to 50%.
      5. Ensure the OAD is closed. If the OAD is not closed, issue a SWO to close the Dampers.
      6. The Heating Valves, Pre-Heat valves, HWPs, OADs and FABs will stay overridden until either:
         - The AHU starts according to schedule, or
         - If the alarm persists longer than 60 minutes, the Heating Valves, Pre-Heat valves, HWPs, OADs and FABs will stay overridden until next scheduled event. File a work order to repair the AHU.
c. When an AHU trips off due to:
   - Freeze Stat
   - AHU Low Temperature Limit

1. Ensure the Heating Valve is 100% open. If not, issue a SWO to open it to 100%.

2. If so equipped, override the Pre-Heat Valves open and the FABs open.

3. Check the HWP indications and ensure it is running. If it is not, the Operator will issue a SWO to turn it on.

4. Issue a SWO to override the Chilled Water Pump on and open the Chilled Water Valve to 50%.

5. Ensure the OAD is closed. If the OAD is not closed, issue a SWO to close the Dampers.

6. The Heating Valves, Pre-Heat Valves, HWPs, OADs and FABs will stay overridden. In order to clear the alarm and reset the AHU, contact and inform the on-call BMC Superintendent of the problem.

d. When the AHU is scheduled off for weekends or holidays, and the OAT drops below 30°:

   The Operator will start the campus AHUs and run them for two hours during each 12 hour period during which the OAT drops to or remains below 30°. Upon the initial occasion when the temperature drops below 30°, the AHU should be started immediately. During subsequent 12 hour shifts, it can be restarted at the Operator’s discretion.

e. Any time the OAT drops below 20°:

   1. The Operator will start all campus AHUs and let them run until the OAT rises above 24°.

   2. The Operator will contact and notify the on-call Emergency Maintenance Supervisor that this action has been taken.

   3. After the OAT rises above 24°, the Operator will return to the normal schedule, or if the AHU is scheduled off for weekends or holidays, to running for two hours during each 12 hour period as described in section 2.d. above.
3. **Documentation and Reporting**

By email, immediately notify the AVP for Operations of each freeze protection action.

4. **Exceptions**

Some specific buildings or AHUs will require unique procedures which are Exceptions to the above. These units must be listed on Appendix A, *Exceptions*, and must be reviewed annually at the same time as this Operating Policy.

**RESPONSIBILITIES**

<table>
<thead>
<tr>
<th>POSITION</th>
<th>SECTION</th>
<th>MONTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Manager</td>
<td>Energy Committee</td>
<td>October</td>
</tr>
</tbody>
</table>

Reviewed: ____________________________

Energy Manager

Reviewed: ____________________________

HVAC Superintendent

Reviewed: ____________________________

EOM Foreman

Reviewed: ____________________________

Systems Maintenance Foreman

Reviewed: ____________________________

Emergency Maintenance Supervisor

Approved: ____________________________

Assistant Vice President for Operations
APPENDIX A, Exceptions

The Air Handlers below require special procedures which cannot be addressed in the Freeze Protection Protocol due to extensive and unique details:

**Animal Science AHUs 2, 3, and 5**
Do not SWO the OA dampers closed on these units unless the units trip off due to Low Limit Alarm; then ensure the OAD is closed and the HWV and CWV are open per the Freeze Protection Protocol, and call out a technician. Units are 100% OA and will be starved if the dampers become shut.

**Animal Science AHUs 1 and 4**
Close these dampers per Freeze Protection Protocol.

**Art 3D AHUs 1, 2, 3**
Close these dampers per Freeze Protection Protocol.

**Art 3D AHU 4**
Do not SWO the OA dampers closed on these units unless the units trip off due to Low Limit Alarm; then ensure the OAD is closed and the HWV and CWV are open per Freeze Protection Protocol, and call out a technician. Units are 100% OA and will be starved if the dampers become shut.

**Art 3D AHU 5**
When the OA temp reaches 40°, issue a SWO of 100% to the OAD. 9/2/15 Per Bobby Flores there should be some doors opened at this area to help keep the units warm.

**Bayer PLSC AHU 1, 2**
Rick Moore (FP&C)—Relayed when the EM office receives a freeze stat (alarm) on these units and they trip OFF, be sure to check the Preheat Valve #1 and make sure it is 100% open. If it is not open, issue a SWO of 100% open and call out the technician. Make sure you call Rick Moore and relay this information too. 12/10/15

**Biology AHUs 1-11 and 16**
Do not SWO the OA dampers closed on these units unless the units trip off due to Low Limit Alarm; then ensure the OAD is closed and the CWV is open per Freeze Protection Protocol, and call out a technician.

Do not SWO the steam valves at this location any time because it may damage the controls and create false fire alarms.

**Biology AHUs 12-15** – Bobby Flores checking on these
Close these dampers per Freeze Protection Protocol.
Do not SWO the steam valves at this location any time because it may damage the controls and create false fire alarms.

**Chemistry Building All AHU’s**

AHUs in the Chemistry building utilize Steam Valves which should not be opened to 100%, as are the Heating Valves above, because this action could overheat and damage components such as temperature sensors and smoke detectors.

For Steam Valves in the Chemistry building, no action should be taken except at the direction of the technician who has been dispatched to troubleshoot the problem. Otherwise, concerning chilled water pumps and valves, the Protocol should be followed.

**College of Business Administration**

Do not SWO the OA dampers closed on these units unless the units trip off due to Low Limit Alarm; then ensure the OAD is closed and the HWV and CWV are open per Freeze Protection Protocol, and call out a technician. Controls will take care of themselves.

**College of Engineering  AHU 1**

Do not SWO the OA dampers closed on this unit unless the unit trips off due to Low Limit Alarm. If the OA dampers do not automatically close, then override them closed and call out a technician. This AHU supplies fume hoods and can create a hazardous atmosphere in the room if the dampers become closed.

If the HWV and/or CWV do not automatically open, then override them open as per the Freeze Protection Protocol, and call out a technician.

**College of Engineering  AHUs 2, 3, and 4**

Close these dampers per Freeze Protection Protocol.

**Drane  AH10**

This unit has no heat (preheat), in order to clear the MAT low alarm you will need to turn ON the unit, per Bobby Flores 9/2/15.
**Experimental Science**

Do not SWO the OA dampers closed on these units. Leave the units alone unless they trip off on Low Limit Alarm; then ensure the OA dampers are closed, and the HWV and CWV are open, as per the Freeze protection Protocol. Call out a technician. These AHUs supply fume hoods and can create a hazardous atmosphere in the rooms if the dampers become closed.

**IEHH 555 (Reese) All AHU’s**

Do not SWO the OA dampers closed on these units. Leave the units alone unless they trip off on Low Limit Alarm; then ensure the OA dampers are closed, and the HWV and CWV are open, as per the Freeze protection Protocol. Call out a technician. These AHUs supply fume hoods and can create a hazardous atmosphere in the rooms if the dampers become closed.

**IEHH 555 – BSL-3Lab**

Take no actions. For any alarm call the people below. This is a highly hazardous, secure location. NO BM&C PERSONNEL are allowed in the lab. Call-outs will go to Linc’s Services.

Jerry Cowen – 806-773-8541

Michael Wages – 543-2828

Ryan Bounds – 470-7116

**Jones Stadium (West) AHU 2**

When the OA temperature drops to 40°, issue a SWO of 100% open to the heating valve Per Jamie (32) and Terry Neal 12/21/12. When the OA temperature drops to 40° issue a SWO of 100% closed to the OAD, Per Terry Neal 1/6/2015.

**Bayer Crop Science (Outreach and Extended Studies)**

This building is currently not monitored by the EM office, leave this in per Lonnie Evans.
**Student Union AH08**

When the OA temp reaches 40°, issue a SWO of 100% closed to the OAD to keep the unit from tripping OFF, per Gabriel Chavez 1/17/14.

**United Supermarket Arena**

AH14 and the hot water pumps will not follow electronic commands due to fire/water damage per Eric Newell 9/3/15. Protocol should be adjusted to include only AH14 as unit to be put in hand mode and steam shop will be requested to adjust valves on hot water system to accommodate dropping temperatures.

Do not SWO the steam valves open at this location anytime because it may damage the controls and create false fire alarms.

When the MAT is in low alarm you need to close the OAD’s, you can do this by going to the master dust switch the enable this point. This will close all the dampers for all the units. You will need to check the units to make sure the dampers did close, The EM operator will NOT turn these units ON for any MAT alarm. per Eric Newell 11/9/15.

If the DAC operator receives a freeze stat alarm or low limit alarm they will need to make sure the HWP’s, CWP’s are ON and the cooling valve is 50% open. The operator will then need to call out a technician and follow their requests. The EM operator will email all information to Eric Newel, Jamie Doggett, Christopher Long, Lon Mirll, Jennifer Dugger, Frances Lucas and Rikki Raines

**West Hall AHUs 1 and 3**

Close these dampers per freeze protection protocol.

**West Hall AHU 2**

Do not SWO the OA dampers closed on these units unless the units trip off due to Low Limit Alarm; then ensure the OAD is closed and the HWV and CWV are open per Freeze Protection Protocol, and call out a technician. Units are 100% OA and will be starved if the dampers are shut.
**Wiggins MUA’s 1-5**

These units will be knifed off in the field, have the hot water and chilled water drained and will be off until further notice; **DISREGARD ALL ALARMS.** This has been done 11/13/15, per Chris Long.

**Wiggins RTU’**s

Turn these units ON when campus is turned on for freeze protection.

**Boston RTU’**s

Turn these units ON when campus is turned on for freeze protection.

**Stangel RTU’**s

Turn these units ON when campus is turned on for freeze protection.

**Murray RTU’**s

Turn these units ON when campus is turned on for freeze protection.