Cold-Deck Air Handlers: AHU-1 Through AHU-4			
Control Strategy		**Sequence of Operation**	
Discharge air temperature reset		Discharge air temperature (DAT) setpoint is reset based on loads within the building as determined by the deviation of zone temperature from the active cooling setpoint for selected zones. If the zone temperature for more than 4 selected zones is warmer than the active cooling setpoint by 1°C (2°F), then discharge air temperature setpoint is lowered by 1°C (2°F) every 5 minutes until a 13°C (55°F) setpoint is reached. The discharge air temperature setpoint is raised by 2°F every 5 minutes when only 2 or less selected zones are warmer than the active cooling setpoint by 1°C (2°F) until a 21°C (70°F) setpoint is reached.	
No	**What to look for**	**What to look at**	**What to do**
1	**Minimum and maximum DAT setpoint values**	At the operator work station (OWS), verify that minimum DAT value is 13°C (55°F) and maximum DAT value of no more than 21°C (70°F).	The chilled water plant was design to satisfy a minimum DAT for each cold-check AHU of 13°C (55°F). DO NOT lower the minimum DAT setpoint below 13°C (55°F) because this makes the chilled water plant unstable. The intent of the maximum DAT value is to minimize zone reheat when a majority of the zones do not have a cooling load.
2	**DAT setpoint is being reset between minimum and maximum values**	Use trend data to verify DAT setpoint is reset between minimum and maximum values. Check this trend for a 1-week period during peak heating, peak cooling, and “swing” seasons.	As loads within the building change, the DAT setpoint should vary over time. If the DAT setpoint doesn’t vary, especially during peak heating or swing seasons, this indicates there may be a problem. Check the AHU1&2 and AHU4&4.xls worksheets located under file folder C:\Project\Hatfield to help troubleshoot discharge air temperature reset controls. The spreadsheet documents all of the polled zones and their respective deviation from setpoint. This can assist in identifying which zones are driving the control strategy (either legitimately due to zone loads or as a “rogue” box that may warrant further investigation or maintenance).
3	**DAT setpoint is being met**	Use trend data to verify DAT setpoint is being met by comparing DAT setpoint (CALC-DA) with measured DAT (DA-T) for each AHU. Check this trend for a 1-week period during peak heating, peak cooling, and “swing” seasons.	If DAT setpoint is not being met, there may be a problem with the following: 1. Economizer 2. Chilled water valve 3. Chilled water plant Further investigation will be necessary to identify the cause of the problem.

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Control Strategy		**Sequence of Operation**	
Economizer control		When the outdoor air fry-bulb temperature is less than return air dry-bulb temperature, the economizer is enabled and the outdoor air dampers are modulated open to meet discharge air temperature setpoint. The economizer is disabled and goes to 100% return air when the outdoor air dry-bulb temperature is greater than the return air dry-bulb temperature. In this condition, the cooling coil valve is modulated as necessary to meet discharge air temperature setpoint.	
No	**What to look for**	**What to look at**	**What to do**
1	**Proper outdoor air damper operation**	At OWS, verify that economizer damper is 100% closed when outdoor air temperature (OAT) is greater than return air temperature (RAT) and the mixed air temperature (MAT) measurement is within a couple degrees of the RAT measurement. The OSA damper should be modulated open as necessary to meet DAT setpoint when OAT is less than RAT. This can be verified anytime an AHU graphic is being displayed, particularly during peak cooling season.	If the OAT is greater than the RAT and the OSA damper is commanded 100% closed but the mixed air temperature (MAT) is higher than 3°C (5°F) above RAT, the OSA damper may not be completely shut and should be investigated. Note that the MAT in this case will always be slightly higher than the RAT due to ventilation air.
2	**Economizer is modulated as necessary to meet DAT setpoint**	Use trends data to verify if OSA damper is modulated open as necessary to meet DAT setpoint when OAT is less than RAT. Monitor outdoor air temperature (OA-T), return air temperature (RA-T), mixed air temperature (MA-T) cooling coil valve position (C-VLV), and discharge air temperature (DA-T) for each AHU for a 1-week period during both peak heating and “swing” seasons.	The economizer cycle should modulate the OSA damper from 0% to 100% open in order to meet DAT setpoint. When OAT is much colder than DAT setpoint, OSA damper should be less than 100% open and the MAT should be close to DAT. When OAT is warmer than DAT setpoint, but less than RAT, OSA damper should be 100% open, OAT and MAT should be the same value, and the cooling coil should modulate open to meet DAT setpoint. If this doesn’t occur, there may be a problem with the following: 1. OSA damper problem if commanded 100% open but MAT greater than OAT 2. Sensors need to be calibrated Further investigation will be necessary to identify the cause of the problem