

TTU has several buildings equipped with two-pipe HVAC hydronic systems including: Clement Hall, Pennebaker Hall, Foundation Hall, Matthews-Daniels Hall, Military Science Building, Derryberry Hall, and Lewis Hall and Crawford Hall

A **“two-pipe hydronic system”** means that the same set of pipes that carry both hot and cold water to the HVAC units throughout the building, but not at the same time. This means that the entire building is either in heating mode or cooling mode. Therefore, when seasons change, the building-wide system needs to be switched from cooling to heating or vice versa to maintain occupant comfort. Several weather-related criteria have to be taken into consideration when deciding when to changeover a building’s HVAC system in Fall and Spring.

Why we can’t just “flip a switch”?: Our systems hold thousands of gallons of water. If we introduce 45°F chilled water into pipes that were just carrying 150°F hot water (or vice versa), the metal pipes would expand or contract too quickly, leading to leaks, pipe bursts, or even catastrophic failure. The changeover process is also a manual process that requires a team of technicians to physically visit mechanical rooms to manually turn large valves, reset heavy machinery, and "bleed" air out of the lines. In a large building, this process can take 24 to 48 hours just to complete the physical transition. Because the process takes so long and is so labor-intensive, we have to be sure about the weather. If we switch to cooling on a Tuesday because it’s 75°F, but a cold front drops the temperature to 40°F on Wednesday, we cannot "switch back" in time to keep the building warm. We have to "commit" to a mode based on long-term trends to ensure the system remains stable and functional.

The "Coast Mode" Compromise: During the spring and fall, you may notice the air feels "neutral." This is because we are in Coast Mode, where we turn the hydronic system off and use outdoor air to regulate the temperature. This saves a massive amount of energy and protects our equipment while we wait for the weather to decide which season it is.

Fall Transition: Beginning in October, buildings may transition from cooling mode to coast mode when 3–5 day projected highs range between 60°F–65°F and lows fall below 45°F. Systems transition to heating mode when projected highs drop below 60°F or lows fall below 40°F, subject to specific building requirements.

Fall Coast Mode Criteria: Highs 60°F–65°F; Lows < 45°F.

Fall Heating Mode Criteria: Highs < 60°F; Lows < 40°F.

Spring Transition: Beginning in April, buildings may transition from heating mode to coast mode when 3–5 day projected highs exceed 60°F and lows remain above 40°F. Cooling mode is activated when projected highs consistently exceed 65°F–70°F and lows remain above 45°F, adjusted for individual building needs.

Spring Coast Mode Criteria: Highs > 60°F; Lows > 40°F.

Spring Cooling Mode Criteria: Highs > 65°F; Lows > 45°F.

Note: Final transitions are subject to specific building requirements.