Heating/Air Conditioning Issues Associated with Two Pipe HVAC Systems

Several UT residence halls have two pipe heating and cooling systems. These include Kinsolving; Blanton; Creekside; LLA, LLB, and LLC. These systems are original to the building and are vastly different from our buildings with four pipe systems. Four pipe systems were installed in several buildings in the early 1990’s that were not originally air conditioned when they were constructed. Four pipe systems are also being retrofitted in renovated buildings where possible.

A two pipe system consists of fan coil units with single coils which are connected to two pipes. These two pipes, one supply and one return, are connected to supply lines in our mechanical room. Supply lines can either supply hot water or chilled water. A building with a two pipe system is either entirely in the cooling mode or entirely in the heating mode. It is not possible to cool some rooms while heating others. A four pipe system has hot water and chilled water pipes in each fan coil unit, thus allowing each unit (i.e. each student room) to independently supply either heat or cooling.

During certain times of the year, especially in the Fall and Spring, it is not uncommon to have alternating hot and cold spells, or cold mornings and warm afternoons. Since two pipe systems cannot handle simultaneous heating and cooling and an entire building must be converted, the change from heating mode to cooling mode can take several hours before there is a noticeable difference.

Buildings automatically switch from heating to cooling or from cooling to heating through a pre-set thermostat that reads outside temperature. Typically, this switch is set to convert at 60 degrees F. However, depending on the time of year, this could be adjusted up or down by maintenance staff to compensate for outdoor temperature changes and to facilitate the building’s ability to switch from one to the other under certain conditions.

Larger buildings could take as much as 24 hours to convert completely. On days with cool mornings and warm afternoons, by the time the building switches modes, it is often time to switch back. On such days, residents must tolerate some temperature swings. Unfortunately, it doesn’t help if residents open their windows on days when the morning is cool and the afternoon is warm. Open windows contribute to excess moisture and humidity. Much of the work done by an air conditioning system is to stabilize and control building humidity. Excess moisture taxes the system’s ability to control humidity, which in turn promotes mold and mildew. In addition, opening windows presents a safety/security concern.

On days when the building’s system is not able to compensate for outdoor temperature swings, residents can take a few measures to help their room remain comfortable. Residents should keep their blinds and room doors closed. Residents should also take care not to block the fan coil unit with furniture or other items, especially the MicroFridge. The heat from the refrigerator compressor will add to the heat load in the room if it is near the vent of the fan coil unit. Residents may also want to purchase a portable fan to circulate the air in the room.