Example Retrocommissioning Measure: Reduce Simultaneous Heating & Cooling

Facility

This 300,000 square foot silicon wafer fabrication facility, constructed from 1997 to 1999, includes Class 1000 to Class 100,000 clean rooms.

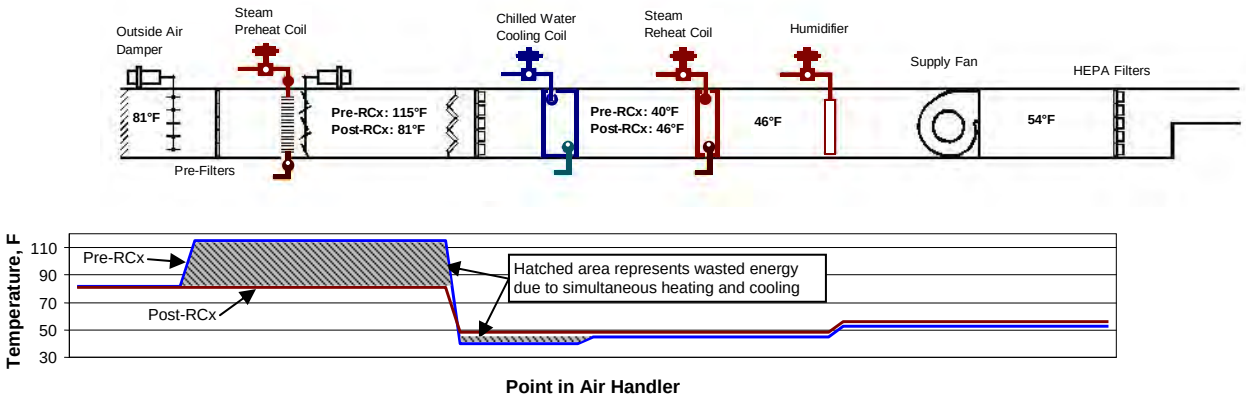
Investigation Finding

One of the building's main clean room make-up air handling units, a large 100% outdoor air system delivering 42,000 cfm, was adequately maintaining the clean room's tight temperature and humidity requirements (68ºF ± 1-1/2ºF, 45% RH ± 5%). Even though the system was ultimately delivering air at the proper temperature and humidity, the air handling unit's individual heating and cooling components were competing with each other by operating simultaneously. The preheat coil heated the 81ºF outdoor air to 115ºF, then the cooling coil cooled the air down to 40ºF, followed by the reheat coil heating the air to 46ºF. Since cooling the air to 40ºF also dehumidified it too much, the steam humidifier was then injecting steam into the airstream.

Implemented Measure

To eliminate this simultaneous heating and cooling and unnecessary humidification, the following minor adjustments were made to the system:

- The preheat coil shutoff valve was integrated with the main control system so that the valve shuts off steam to the coil when it is not needed.
- Temperature sensors that were out of calibration were replaced.
- The control sequence was revised for more stable and efficient operation.



Results

Estimated annual total gas and electric savings	**$84,000**
Implementation cost	$7,000
Simple payback	0.1 years