

Summary

Phase 4 at Altium consisted of hydronic balancing for the Husky process water loop and the Husky tower loop. The process water loop includes two pumps, heat exchanger, and terminal flow devices. The tower loop consists of three pumps, heat exchanger, chiller, and two cooling towers.

TAB was first completed for the tower water loop. The pumps were set to design flow using the locking valves at the discharge of the pumps and calculating flow using the pumps' rated head for design GPM. The heat exchanger and chiller condenser were balanced using the locking valves. It should be noted that the design for the heat exchanger is 1000 GPM and Chiller condenser 750 GPM for total flow of 1750 CFM. However, each pump/cooling tower is rated for 1250 GPM. If only one pump is running, this would not satisfy the requirements for the heat exchanger and chiller so both pumps must run simultaneously to handle the connected load resulting in 2500GPM total flow design. There is no bypass present so full flow must pass through the heat exchanger and the chiller condenser. The chiller condenser was balanced to 904 GPM and the HX to 1582 GPM. The chiller condenser flow could not be balanced to within 10% of design due to limits with the notched butterfly valve so flow was left high instead of low. Closing the valve to the next locking position caused low flow. Flow distribution to the cooling towers was left as-is per the preliminary TAB survey performed prior to piping changes.

TAB was then completed for the process line water loop. The pumps were balanced via the locking valves at the discharge of the pump and setting to the pumps rated head. Once pumps were set to design flow the bypass valve was closed until the pressure in the supply header was at 45 PSI. With all bypass valves for the process machines closed, the pressure drop across each machine was found to be approximately 30 PSI as required. The bypass valves for each machine were set by first closing off flow to the machines then adjusting the bypass balancing valves until design flow was achieved. Note that flow could not be measured to the air compressors or air dryer also served by process water due to the lack of balance valves or pressure ports. No design criteria are provided for air compressors or air dryers.

Temperatures across applicable devices were not recorded since the system was not running with accurate heat loading from the husky line machines.