

■ Chilled Water System Checklist

- **Convert Three-Way Chilled Water Valves to Two-Way Valves**
Check the configuration of each chilled water valve on each cooling coil (includes AHUs, fan coils, etc.). If three-way valves and constant volume pumps are installed, convert the valves to two-way and install variable frequency drives (VFDs) on secondary chilled water pumps. The secondary chilled water loop pumps should have VFDs and two-way valves on all cooling coils (the AHU that is the furthest away from the chiller plant can have a three-way valve). Once the valve configuration is confirmed to be correct, check that the static pressure setpoint controlling the pump VFDs isn't set artificially high.
- **Install More Efficient Cooling Equipment**
Replace inefficient cooling equipment with new high efficiency equipment that has a higher coefficient of performance (COP) than the existing equipment. Refer to ASHRAE Standard 90.1 – 2010 for the most comprehensive set of efficiency standards for cooling equipment.
- **Replace Large Air Cooled Cooling Equipment with Water Cooled Chillers and Cooling Towers**
All air cooled chillers over 100 tons should be replaced with water cooled chillers. Water cooled chilled water plants have COP ratings that are approximately twice as high as air cooled equipment.
- **Reset Chilled Water Supply Temperature Based on Cooling Coil Valve Position**
Adjust the chilled water supply temperature based on cooling coil valve position. The chilled water supply temperature should be reset, up to a maximum temperature of 50°F. The control algorithm should be set up such that the coil with the largest cooling load maintains the valve at 90% open.
- **Reset Condenser Water Based on Outside Air Wet-Bulb and Install VFDs on Cooling Tower Fans**
Reset the condenser water supply temperature to within 3°F to 7°F of the outside air wet-bulb. This reduces the temperature lift between the condenser and evaporator in the chiller and significantly reduces chilled water system energy use. In addition, VFDs should be installed on cooling tower fans and the control sequence should be set up such that the VFDs ramp up to 50% before bringing on a second fan. The control system should operate the maximum number of cooling tower cells.
- **Convert the Primary/Secondary Chilled Water Plant to Variable Flow Primary**
Evaluate the opportunity to remove the primary chilled water pumps, and use the secondary pump (which can be resized as needed) as the variable flow primary pump with a modified control sequence.
- **Install a Desiccant Dehumidification System**
Moisture can be removed from conditioned air through the use of desiccants such as lithium bromide (LiBr). Desiccants enable independent control of temperature and humidity, improving heating, ventilating, and air conditioning (HVAC) system efficiency. Desiccant components can be powered by waste heat from a local onsite producer.