The Importance of Routine On-site Monitoring

Water treatment is critical preventative maintenance for cooling tower systems. The bleed and treatment chemical levels must be consistently kept in range to prevent problems that reduce system life, efficiency, reliability, and safety and can result in unexpected system failure. Regardless of how much the water treatment program is automated or how often the water treatment company representative services your facility, an in-plant monitoring program is necessary to prevent minor concerns from developing into major problems.

General guidelines

1. Check water treatment controller operation
   - Check bleed controller readout for high/low conductivity readings.
     - If conductivity is significantly below set point (low), check for leaking bleed valve or high water level in tower sump. Low conductivity indicates excess bleed, which wastes water/chemicals and contributes to corrosion.
     - If conductivity is significantly above set point (high), check for blocked bleed valve. High conductivity indicates inadequate bleed, which can cause scale deposits, fouling, and lead to system shutdown.
   - Check for any other alarm conditions and respond appropriately.

2. Check operation of chemical feed and control equipment
   - Check chemical pumps for prime and operation. Re-prime or repair as needed.
   - Inspect chemical feed system for leakage. Repair as needed.
   - Check inventory in chemical feed/storage containers. Verify chemical levels in container are dropping as expected. Change out chemical containers as necessary to ensure uninterrupted feed. Place orders for replacement product on a timely basis.

3. Visually inspect cooling tower and heat exchange equipment
   - Check cooling tower distribution trays and spray nozzles to ensure good water flow. Poor water flow over the tower fill or condenser tubes will cause deposits regardless of water treatment measures.
   - Check tower basin and fill for excessive buildup of dirt, microbiological growth, and other deposits. Cooling towers should be cleaned and disinfected at least once per year (twice/year is preferred). More often may be necessary.
   - Check heat exchange equipment for signs of fouling, such as a high head pressure and/or approach temperature. Any deterioration of heat transfer is a serious concern that should be addressed with your water treatment representative.

4. On-site water testing
   - An on-site testing program helps verify that the proper bleed and chemical levels are consistently maintained. All test results and corrective measures should be logged for review by your water treatment representative.
   - Check tower conductivity and compare to target conductivity range established by water treatment company.
     - If conductivity is below target (low), check for leaking bleed valve or high water level in tower sump. Low conductivity indicates excess bleed, which wastes water/chemicals and contributes to corrosion.
     - If conductivity is above target (high), check for blocked bleed valve. High conductivity indicates inadequate bleed, which can cause scale deposits, fouling, and lead to system shutdown.
     - If controller operation is suspect, compare controller conductivity reading to hand held meter reading. If appreciably different, clean conductivity probe and recalibrate controller.
• Check tower inhibitor level and compare to target inhibitor level range established by water treatment company.
  - If inhibitor level is below target range (low)
    1. Make sure inhibitor chemical feed pump is primed and container is not empty.
    2. If the tower conductivity is within range or low, increase inhibitor feed pump/timer settings to raise inhibitor level.
    3. If tower conductivity is also high, severe scaling conditions exist. To minimize damage, it is critical that the tower be bled to lower the conductivity into the desired range and the inhibitor feed rate be increased to the target range.
  - If inhibitor level is above target range (high)
    1. If tower conductivity is within range or low, reduce inhibitor feed pump/timer settings to lower inhibitor level.
    2. If tower conductivity is high, do not reduce inhibitor feed rate. Locate and correct cause of high tower conductivity. The inhibitor level will decrease as the conductivity falls within range.

• Additional control tests may be specified by your water treatment representative based on system design, operating conditions, and water quality.

5. It is very important to promptly communicate any problems, questions as to procedures, and system inspections to your water treatment representative.