Pulse-Power Device Fails against Chemical Water Treatment

Background
A specialty pharmaceutical manufacturer in Northern California was approached by a company promoting a device to replace their successful Chem-Aqua water treatment program. The device reportedly employed a “pulse-power” system to eliminate the need for chemicals.

The facility had two independent 300 ton Mammoth®* Evaporative Cooled Chillers (evaporative condensers) to provide climate control for the research laboratories and manufacturing facility where reliability and tight control of room conditions was critical. The company decided to install the pulse-power system on one of the two Mammoth units so the device could be directly compared with a proven chemical program.

Results
The pulse-power unit was installed per manufacturer specifications and the bleed controller was left in operation with the same set point used for a chemical program (about 4.5 cycles). The other system stayed with the Chem-Aqua water treatment program, which consisted of a corrosion/scale inhibitor and two biocides.

Both evaporative condensers were inspected every three months. During the first inspection, it was apparent deposits were building up on the condenser coil and louvers in the pulse-power treated unit so it was pressure washed to help remove the deposits. The condenser coils in the Chem-Aqua treated unit remained free of scale deposits.

The same results were found during each subsequent inspection. After three years, the trial was discontinued due to the pulse-power unit’s failure to prevent scale: deposits on the condenser coils exceeded 1/8” in most places. In contrast, no scale deposits were observed in the Chem-Aqua treated unit.

The Chem-Aqua water treatment program kept the condenser coils clean and energy efficient while the pulse-power treated unit developed heavy, energy-robbing scale deposits. The end result of using the pulse-power device was increased maintenance, higher energy costs, and increased greenhouse gas emissions.

*Registered trademark of Mammoth, Inc.