Pulse-Power Device Failure in Large Medical Center

Background
A large Medical Center on the west coast of Florida was retrofitted with new chillers and cooling towers. The architect/design engineer specified a non-chemical device (NCD) for cooling tower treatment so the bleed could be discharged into an onsite decorative pond. This would enable the facility to eliminate sanitary sewer charges while demonstrating a commitment to sustainability.

The new chiller plant consisted of 4,750 tons of refrigeration with stainless steel cooling towers. To meet the design specifications, a pulse-powered NCD with twin centrifugal particle separators was installed. The NCD provider claimed that, with a routine service program, the NCD would provide effective scale, corrosion, and microbiological control equivalent to chemical treatment.

Results
The Medical Center rigorously followed the recommendations provided for the NCD program. However, despite repeated program modifications, serious problems developed:

- The chiller condenser tubes had to be brushed and/or acid cleaned quarterly to maintain heat transfer
- After only five years of operation, the tower fill had to be completely replaced due to massive deposits that blocked water flow and reduced cooling efficiency
- Frequent tower cleaning was required due to microbiological growth and deposits in the tower basin
- Serious corrosion problems developed including leaks in tower basins

Excessively high energy consumption, maintenance costs, and labor were incurred by the Medical Center due to overall failure of the NCD. The NCD failed to produce results for scale, corrosion, and microbiological control equal with that of traditional water chemistry.