MarTech Systems

Case History

Supplemental Water Treatment Training for Operators

A Southern petrochemical plant routinely conducted their standard operator training; however, their operators had difficulty mastering proper operation of the three-bed demineralizer system. The system lacks excess production capacity and has no storage tank, increasing the reliance on operator expertise and risk of poor system performance. The Unit Manager requested supplemental classroom training for operators.

Operators are responsible for monitoring two parallel trains of demineralizers: a dual-bed followed by a mixed bed. The key to operator effectiveness is a clear understanding the theory of ion exchange, the sequence of steps during service and regeneration and the vessel configuration. (**Figure 1**)

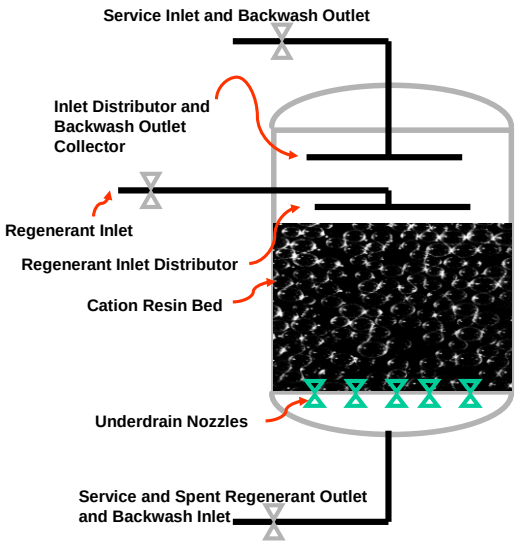

Figure 1 – Cation exchange unit

Students strengthened their understanding of demineralizer operation by completing quizzes (**Figure 2**) and participating in group problem solving sessions.

Quiz #2

True or False

__ 1. Ions can change charges (e.g. + to -).
__ 2. Ion exchange resin should always be wet.
__ 3. Ions are exchanged only on the outside of the resin bead.
__ 4. A regenerant is a material that restores the beads to a new condition.
__ 5. Gellular and macroreticular describe the manufacturing process for the bead.
__ 6. Ion exchange remove only insoluble compounds.

Figure 2 – Sample Quiz

Our training also reviewed methods to evaluate system efficiencies. **Figure 3** shows the results of an elution study.

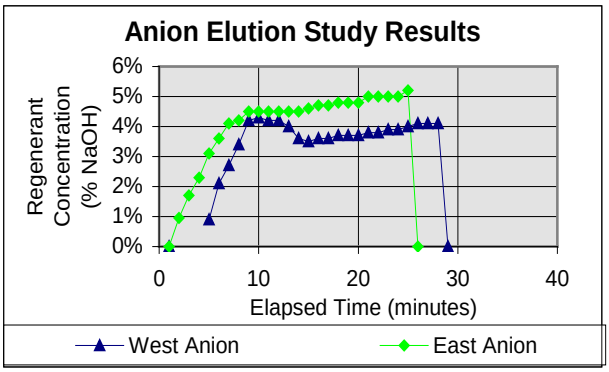

Figure 3 – Elution Study Results

We trained operators from all four shifts. The operators have demonstrated an ability to troubleshoot non-conforming operating conditions and produce high quality demineralized water, resulting in no lost opportunity costs for the boiler system for the last five years.

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