Softener Efficiency Optimization Training Design

General Topics

Items in Red areto be presented in WQA General Training / **Items in Blue are for the manufactures to teach/Items in Green are pre-requisites to be completed before training**

Learning Objective	**Knowledge & Skills**	Notes
Understand why salt in wastewater needs to be minimized & how softeners contribute	- Identify wastewater end use - What kind of reuse problems does excess salinity cause - Financial burden of excess salt to wastewater plant - How much of contribution comes from softeners - Reduction in salinity possible from efficient softeners	
Know what factors improve softener efficiency	Overview: a. Accurate settings needed for actual hardness conc. b. DIR c. Upflow brining d. Proportional brining e. variable reserve capacity f. Twin tank & progressive systems g. Leaks	DIR - meter vs. sensor type; programming (science behind this is general); some might be covered in service training, but may be best to leave it as part of the manufacturers' training Optimization will need to be done twice; once during the original chloride reduction effort and again when water source switches to Lake Michigan
Identify why softeners are used & benefits of softened water	a. What are the problems caused by water hardness and iron b. How is water hardness classified c. Where do these contaminants come from d. Water heater efficiency e. Water temperature and detergent use in cleaning	
Explain the importance of other softening applications	a. Health hazards that can be addressed by IX softeners b. Softener as pre-treatment for RO or Anion units	Extra care needed for softeners on dialysis systems and other health-related usage of water treatment
~~Learn to test water for hardness & interpret results~~	~~a. What methods are available for testing water hardness?~~ ~~b. What's needed for an accurate test?~~	Use GIS hardness data from city; avail on city app

Explain how softeners work and how system components and hydrodynamics affect efficiency	a. Water softener components b. IX chemistry d. Causes of resin aging and effect on efficiency f. Causes of resin fouling, effect on efficiency, resin cleaner options g. What happens in the service cycle h. What happens in the regeneration cycle i. What affects efficiency (pressure, flow rate, water temperature, reserve, salt curve, brine contact time, resin fouling, resin age)	Manufacturers to cover resin options & service/regeneration cycle events specific to their product
Size softeners by capacity and service flowrate needs	a. Sizing softeners - capacity b. Calculating efficiency (w/ downgraded resin age) c. Sizing softeners - usage info adjustments	Changes in # of ppl from the time the original unit was installed will affect usage and needs to be addressed by manufacturers during valve programing training
Explain design options that optimize softener efficiency - only those applicable to the specific manufacturer's line	a. What's the difference between DIR & Timeclock; legacy valves & various model options b. Upflow vs. downflow brining c. How do today's smart controllers optimize operation d. Difference between single tank/twin f. Progressive alternating systems - for commercial g. Brine reclaim (some residential; commercial) h. Resin options and influence on efficiency	All manufacture driven.
Other on-site service issues	a. Remind customers the importance of addressing leaks in their home b. Discuss procedure for adjusting salt plate to ensure water in brine tank can reach the salt	Leaks - service techs are not expected to look for leaks in customer's plumbing or fixtures, but should point to the city of Waukesha's website for resources on addressing leaks.
Learn the general steps of the optimization check list and complete the optimization report Practice performing the steps in the optimization checklist	a. Using the optimization check list b. Completing the optimization report Practice performing the steps in the optimization checklist	Use electronic form from city

Practice completing the optimization report

Practice completing the optimization report