- *ONE TEAM.*
- *ONE FOCUS.*
- *YOUR SUCCESS!*

RTI

Recirculation Technologies, LLC

Your Full Service Resource For Water System Improvement

Water Plant Technical Audits

Situation: Need For Pure Water

A large process plant is similar to the human body – to be healthy, each system within needs to function properly both together and independently from other systems. The water plant is like the heart of the larger operation. Without a proper functioning water system, the manufacturing part of the operation can lose productivity and capacity, much like a human body slows down when the heart is compromised.

Pure water is the lifeblood of every process plant. Ensuring that enough high quality water is generated while optimizing costs is therefore a key strategic goal for managers of high-performing industrial water systems. However, a number of factors have to work well in order for these systems to be at their best. RTI sees five key factors that affect water system performance:

- **Inlet water quality**, which can vary tremendously during each year
- **Ion exchange resins and reverse osmosis membranes**. Where both inherent health and fouling levels influence quality and costs
- **Equipment capability**, which is affected both by maintenance schedules and technology
- **Regeneration procedures**, both as written and actually followed
- **Operator performance**, focused mostly on how they run the system day-to-day

RTI's Technical Audit program takes all five of these factors into account to produce an action oriented report that identifies and prioritizes key water plant improvement opportunities. A primary benefit of the audit is that we help you identify variations from best practices while they are small and actionable – *before they become major problems.*

Tech Audits: What Do We Do?

The Water Plant Technical Audit analyzes and quantifies the efficiency of the water plant chemistry and operating results compared to industry standards. In detail, the audit looks at:

- **Throughput analysis**, comparing trains, design vs. actual and actual vs. inlet conditions
- **System design review**, comparing vessel sizes, resin volumes, service flows and equipment to industry best practices
- **Regeneration review**, including a step-by-step comparison against original OEM design and industry best practices
- **Equipment inspection** to determine the condition of the vessels, valving, piping, instrumentation and dilution skids
- **Resin and membrane** history and current capabilities
- **Data monitoring** programs and use of data for decision making
- **Operator training** and reporting to determine completeness and consistency

The report gives a summary of findings and a technically prioritized list of recommendations for improvements/upgrades. You then factor in time lines, MOCs and funding requirements as well.

Benefits of a Technical Audit

With the Technical Audit analysis and other information from your operation, we work together to:

- Cut the costs of operating the water system
- Make the water system more reliable and consistent in operation
- Improve the monitoring and use of key information to help planning
  - Look for trend changes over time and react accordingly
  - Use the data to predict future performance and develop improvement scenarios (e.g., optimal time to restore ion exchange resin)
- Recommend equipment and operating changes that will benefit both costs and quality
- Develop on-going operator training and communications programs to maintain performance improvements

Data Monitoring Best Practices

An outgrowth of Technical Audits often is a focus on monitoring key performance information variables going forward. The following chart gives an indication of the range and depth of information needed in ion exchange demineralizers to stay on top of a water plant program to improve efficiency and effectiveness:

Demin/Resin Systems
Best Practices Checklist

1. Proactive Data Tracking/Trending	Vessel	Train	System	Frequency
Process Information - Trended				
Throughput	X	X	X	Every run, trend weekly
Inlet Conductivity			X	Track daily, trend weekly
Inlet turbidity			X	Track daily, trend monthly
Anion rinse time		X	X	Track daily, trend monthly
Number of regens - cation		X	X	Track daily, trend monthly
Number of regens - anion		X	X	Track daily, trend monthly
Acid used per regen	X	X	X	Track daily, trend monthly
Caustic used per regen	X	X	X	Track daily, trend monthly
Gallons per minute	X	X	X	Track daily, trend monthly
Total gallons produced		X	X	Track daily, trend monthly
System Configuration Information				
Type of resin	X			When installed
Resin age	X			Update monthly
Last date cleaned	X			Update monthly
Acid cost			X	Update monthly
Caustic cost			X	Update monthly
Bed Size	X			When installed
2. Resin Sampling/Profiling				
Cation: Moisture	X			Every three months
Hardness	X			Every three months
Silt/particulates	X			Every three months
Anion: Salt split	X			Every three months
Total Capacity	X			Every three months
TOC	X			Every three months
Run extension Incr.	X	X		Every three months
Fouling trend: cation	X		X	Every three months
anion	X		X	Every three months
Ease of sampling	X			When installed
3. Equipment Issues				
Vessel laterals	X			Annually
Vessel lining	X			Annually
Controls	X		X	Annually
4. Regeneration Protocol				
Scheduled times	X			Annually
Actual times	X			Annually
5. Operator Training				
Training dates			X	Annually
Flow charts developed			X	Annually
6. Predictive Maintenance Planning			X	Monthly update

How to Get Started

- Data is generated and recorded specific to your system's performance and capabilities
- Together with you, RTI examines other water plant issues impeding system performance
- RTI prepares a comprehensive improvement plan...**ready for implementation**!

ReStore.....Don't Replace!

Reduce Water Risk > **Improve Water Quality** > **Cut Operating Costs**

Call or Contact RTI at (215) 682-7099

www.rtiservices.com

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