



Water Reduction

GE Power & Water

Water & Process Technologies

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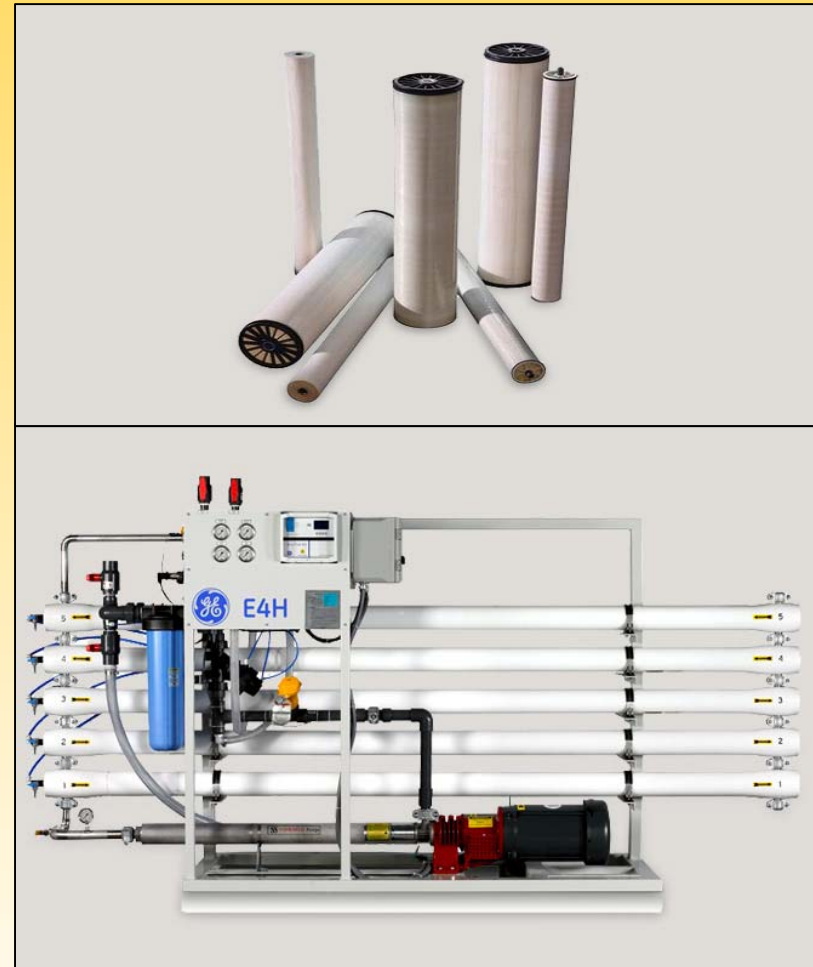


UNIVERSITY OF MINNESOTA

Driven to DiscoverSM

Company Overview

- Water Purification Technology
 - Filters
 - RO Equipment
 - Elements
 - Membranes
- Diverse Application
 - Industrial
 - Commercial
 - Municipal



Motivations for Change: Financial For 2011

Total Usage: 60.7 million gallons

Total Cost:

- City Water: \$ 136,000 (~\$1.91/1000 gallon)
- City Sewer : \$ 88,400 (\$3.10/1000 gallon)
- Strength Charge : \$40,000
- SAC Capacity: \$56,000

Motivations for Change: Environmental



- Non-contact cooling water is directly discharged to pond
- Ecomagination
- Site is a water business!

Approach

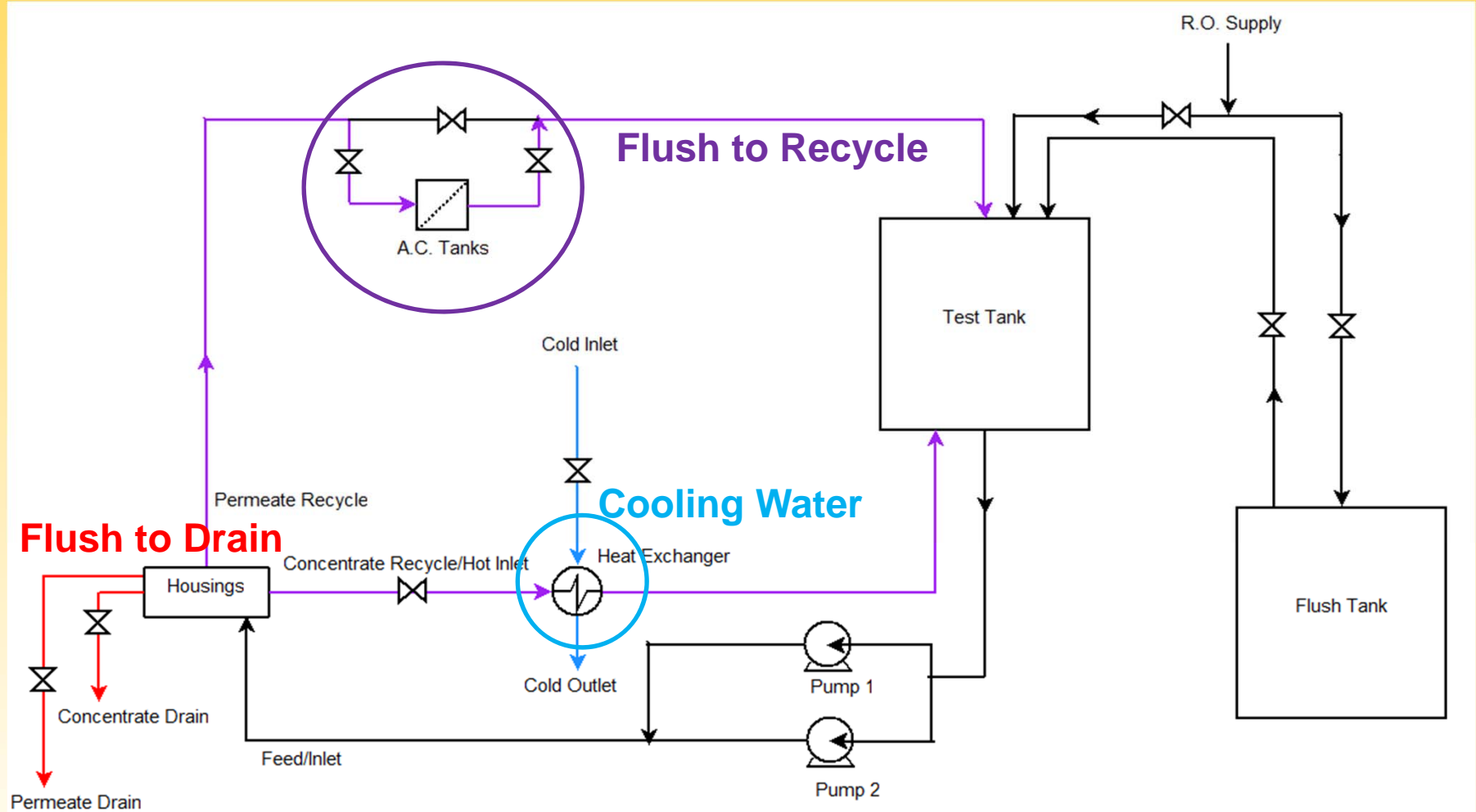
- Identify high volume use areas
- Determine low risk areas
- Assess resolution of preexisting data
- Establish available resources
- Investigate previous water reduction projects

Determining Opportunities

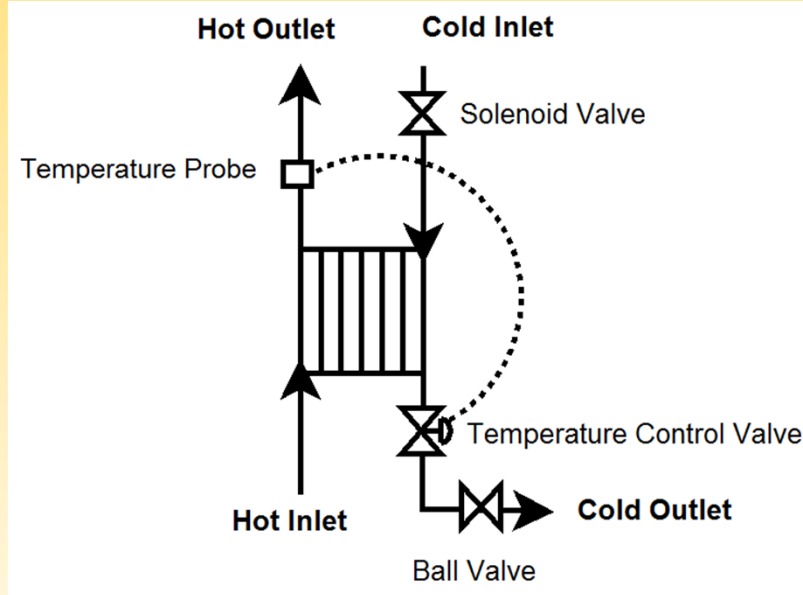
- Research
- Observe/Interact
- Measure
- Discuss



Element Testing: Overview



Element Testing: Cooling Water



- Opportunities
 - Controls
 - Available alternatives
- Solutions
 - Eliminate single-pass system
 - Utilize chiller capacity
 - Provide automated control

Element Testing: Flush Cycles

- Opportunities
 - Protocol/Documentation
 - Operation
- Solutions
 - Implement process control
 - Promote awareness
 - Update database

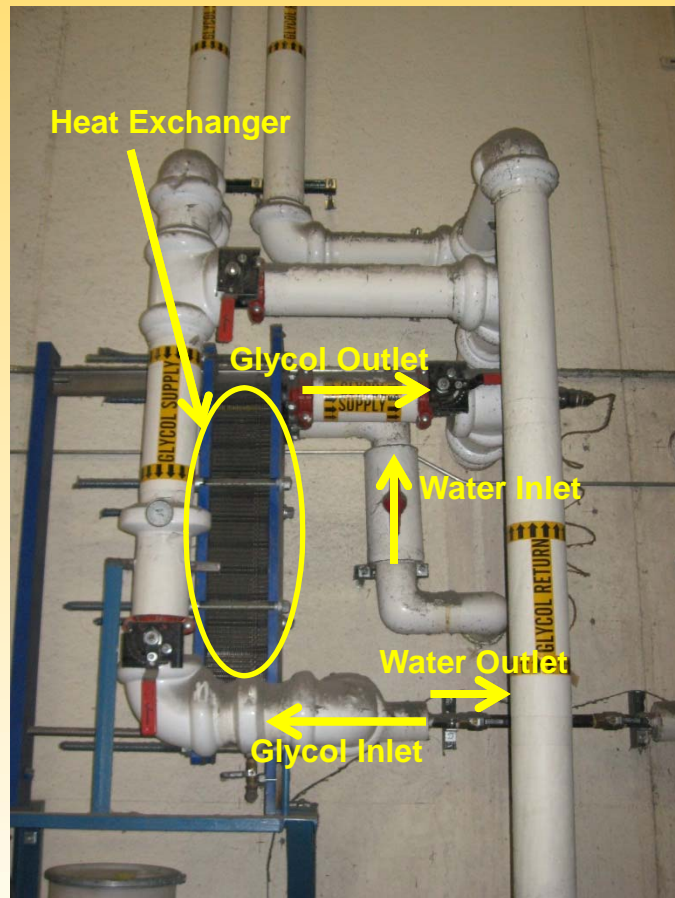


Identified Savings

Recommendations	Water savings (gpy)	Annual Savings	Capacity Savings
Chiller Tie-in	1,900,000	\$4,000	N/A
Flush Cycle Control: Two Test Machines	3,200,000	\$17,000	\$ 223,000
Flush Cycle Control: Other Test Machines	2,100,000	\$ 12,000	\$ 144,000
Total	7,200,000	\$33,000	\$367,000



Trim Cooler



- Operates 24/7 (Summer)
- Uses 4.9 million gpy (8 % Total Water Intake)
- Costs \$ 10,000 annually (Water fees)

Trim Cooler (con't)

- Opportunities
 - Responsible for 50 % increase in cooling water during summer
 - Need a system that can handle future additions
- Recommended Solutions
 - Refine set points of system
 - Improve controls
 - Replace with closed-loop chilling system

Personal Benefits

- Hands-on Experience
- Teamwork and Coordination
- Corporate Atmosphere
- Technical Knowledge
- Environmental Perspectives
- Cost Analysis



Questions?

