Water Reduction
GE Power & Water
Water & Process Technologies

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Driven to Discover℠
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

Flush to Drain

Flush to Recycle

Cooling Water
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

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Water savings (gpy)</th>
<th>Annual Savings</th>
<th>Capacity Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chiller Tie-in</td>
<td>1,900,000</td>
<td>$4,000</td>
<td>N/A</td>
</tr>
<tr>
<td>Flush Cycle Control: Two Test Machines</td>
<td>3,200,000</td>
<td>$17,000</td>
<td>$223,000</td>
</tr>
<tr>
<td>Flush Cycle Control: Other Test Machines</td>
<td>2,100,000</td>
<td>$12,000</td>
<td>$144,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7,200,000</strong></td>
<td><strong>$33,000</strong></td>
<td><strong>$367,000</strong></td>
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</tbody>
</table>
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?