Water and Energy Efficiency at Hospital Facilities

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North Memorial Health

• Founded in 1954
• Hospitals and clinics throughout northwestern Twin Cities
• North Memorial Health Hospital has 3500 employees and 350 beds
• Maple Grove Hospital has 350 employees and 130 beds
• Maple Grove Hospital founded as partnership between North Memorial Health and Fairview in 2009
Project Overview

• North Memorial Health Hospital:
  • 38 million gallons of water in 2017
  • 1 million Therms of natural gas
  • 17 million kWh

• Maple Grove Hospital:
  • 19 million gallons of water in 2017
  • 50,000 Therms of natural gas
  • 8 million kWh

• Find ways to reduce water and energy consumption

• Reduce operating costs and impact on environment
Approach

• Talked with maintenance staff about possible ideas
• Reviewed utility bills and reports
• Talked with manufacturers to find how systems should operate
• Researched possibility of replacing systems at end of useful life
Primary Recommendation

Solenoid Valve and Timer for Soup Kettle Trough

• Used over 1.5 million gallons each year of 127 degree water
• Valve could be turned on, but be forgotten to be turned off
• Installed NC solenoid valve with timer
Primary Recommendation

- Will save over 1.3 million gallons and 7000 Therms
- $500 to implement
- $13,000 in savings each year
## Solutions

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Annual reduction</th>
<th>Total cost</th>
<th>Annual savings</th>
<th>Payback period</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solenoid Valve and Timer</td>
<td>1.3 mil gal water</td>
<td>$500</td>
<td>$12,500</td>
<td>2 weeks</td>
<td>Implemented</td>
</tr>
<tr>
<td></td>
<td>7,000 Therms</td>
<td></td>
<td>$600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condensers Loop</td>
<td>2.6 mil gal water</td>
<td>$25,000</td>
<td>$24,000</td>
<td>1.1 years</td>
<td>Recommended</td>
</tr>
<tr>
<td>New Reverse Osmosis System</td>
<td>764,000 gal water</td>
<td>$25,000</td>
<td>$7,000</td>
<td>3 years</td>
<td>Recommended</td>
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<tr>
<td>Linkage-less Control on Boilers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Further Investigation Needed</td>
</tr>
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<td>Recommendation</td>
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<td>--------------------------------------------</td>
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<tr>
<td>New Dishwasher at Maple Grove Hospital</td>
<td>176,000 gal water 166,000 kWh</td>
<td>$57,000</td>
<td>$650 $12,000 $4,500</td>
<td>3.3 years</td>
<td>Recommended at end of life</td>
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<tr>
<td>New Dishwasher at North Memorial Health Hospital</td>
<td>170,000 gal water 150,000 kWh</td>
<td>$155,000</td>
<td>$1,600 $10,100 $7,500</td>
<td>8.1 years</td>
<td>Recommended at end of life</td>
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<td>Weather Sensors at North Memorial Health Hospital</td>
<td>162,000 gal water</td>
<td>$4,000</td>
<td>$1,500</td>
<td>2.7 years</td>
<td>Recommended</td>
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<td>Weather Sensors at Maple Grove Hospital</td>
<td>360,000 gal water</td>
<td>$250</td>
<td>$1,350</td>
<td>2 months</td>
<td>Recommended</td>
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</tbody>
</table>
Personal Benefits

• Learned a lot about different types of mechanical systems
• Saw how hospitals operates behind the scenes
• Learned how to connect with vendors and be diligent in gathering information