Water, Energy, and Chemical Optimization at a Potato Processing Plant

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Company Background

Lamb Weston
• Founded in 1950 by F. Gilbert in Weston, Oregon
• Are the #1 frozen potato product producer in the US
• Products are found in over 100 countries
• 24 plants employ 6,000+ people around the world

Park Rapids Plant
• The 500,000 sq. ft. plant employs 429 hourly and 50 salary employees.
• Produces 450 million pounds of French fries and other food products every year.
Project Overview

Goals

• Identify any and all areas where improvement or optimization can be had
• Look at water, energy, and chemical reduction
• Line 1 Blancher had the largest opportunity
• Maximize output and minimize consumption
What is blanching?

- Removes sugars and starches from the product
- Helps preserve the product
- Effects texture, color, and lifespan
Approach: Blancher Recommendation

Methods

• Take readings of blancher water quality
• Track and record all of the data
• Develop solutions
• Calculate potential savings and costs
Solution

- Add turbidity sensors in the line 1 blancher
- Configure the sensors to signal the water control valve based off continuous water quality readings

Why

- Similar solutions can be applied to other blanchers
- Large potential for reduction
- Saves both water and natural gas
# Primary Recommendation

<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>Install Turbidity Sensors in both Zones of Blancher 1</td>
<td>• 9,930,000 Gallons of water</td>
<td>TBD</td>
<td>$41,000</td>
<td>TBD</td>
<td>Recommended</td>
</tr>
<tr>
<td></td>
<td>• 59,000 Therms</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
## Solutions

<table>
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<td>Recommended</td>
</tr>
<tr>
<td>Upgrade fluorescent hi-bays to LED hi-bays</td>
<td>245,700 kWh 241 hours of labor</td>
<td>$132,100</td>
<td>$41,300</td>
<td>3.2 Years</td>
<td>Recommended</td>
</tr>
<tr>
<td>Increase time interval on entryway foamer stations</td>
<td>568 gallons of chemical solution, 825 pounds of hazardous chemical</td>
<td>Labor</td>
<td>$10,900</td>
<td></td>
<td>Implemented</td>
</tr>
<tr>
<td>QA sample return</td>
<td>42,000 Pounds of finished product</td>
<td>Labor</td>
<td>$13,000</td>
<td></td>
<td>Recommended</td>
</tr>
<tr>
<td>Feedwater pump VFD</td>
<td>342,200 kWh</td>
<td>$110,000</td>
<td>$31,200</td>
<td>3.5 Years</td>
<td>Investigating</td>
</tr>
</tbody>
</table>
Anecdote

Never assume something is simple to produce just because it's a simple looking product.