Results and experiences with the new Putsch PKF NG

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Background

• ACSC - Hillsboro, ND Factory
  – First Campaign - 1974-75
  – 9000 tpd slice (5000 tpd original)
  – Putsch Carbonation System (1998)

• Typical Operating Conditions (5yr average)
  – CaO/NS: 114%* (*-kiln and pebble lime)
  – Lime Loss: 0.15% on beet
Goals of Project

- Increase 1<sup>st</sup> Carbonation Filtering Capacity
- Increase Carbonation stability
- Decrease lime cake sugar loss
PKF NG - Features

• Hydraulic
  – Single hydraulic pump

• Washing Machine
  – Light beam vs. proximity switches

• Safety
  – Safety doors
PKF NG Installation
PKF Operational Changes

• PKF Piping
  – Individual feed, filtrate and wash

• Automatic control of Final Pressing
  – Based upon mud density
PKF Operational Changes

- **PKF Piping**
  - Individual feed, filtrate and wash

- **Automatic control of Final Pressing**
  - Based upon mud density

- **Cleaning of Mud Channel**
  - Water and Air

- **PKF Filling**
  - Pressure-based fills
PKF Operational Changes

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  – Individual feed, filtrate and wash

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• PKF Filling
  – Pressure-based fills
## PKF Targets

<table>
<thead>
<tr>
<th>Step Description</th>
<th>Preset</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Pressing Time (step 15)</td>
<td>(40-60)</td>
<td>45</td>
</tr>
<tr>
<td>Intermediate Pressing Time (step 18)</td>
<td>(50-70)</td>
<td>65</td>
</tr>
<tr>
<td>Cake Wash Time (step 22)</td>
<td>(800-900)</td>
<td>900</td>
</tr>
<tr>
<td>Final Pressing Time (step 24)</td>
<td>(90-110)</td>
<td>90</td>
</tr>
<tr>
<td>Cake Drying Time (step 28)</td>
<td>(90-120)</td>
<td>120</td>
</tr>
<tr>
<td>Feed Channel Cleaning Time (step 28)</td>
<td>(20-30)</td>
<td>20</td>
</tr>
<tr>
<td>Feed Channel Drying Time (step 29)</td>
<td>(20-30)</td>
<td>20</td>
</tr>
<tr>
<td>Air Release Time (step 31)</td>
<td>(20-60)</td>
<td>30</td>
</tr>
<tr>
<td>Mud Filling Pressure Sp</td>
<td>(50-150)</td>
<td>95.0</td>
</tr>
<tr>
<td>Base Mud Volume (gallons)</td>
<td>(1400-1600)</td>
<td>1400</td>
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<tr>
<td>Minimum Mud Flow (gallons)</td>
<td>(150-400)</td>
<td>250</td>
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<tr>
<td>Max Mud Total (gallons)</td>
<td>(1800-3500)</td>
<td>2650</td>
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<tr>
<td>Wash Water Volume (gallons)</td>
<td>(500-1000)</td>
<td>900</td>
</tr>
<tr>
<td>Fill Time (overrides gallons)</td>
<td>(500-1500)</td>
<td>1000</td>
</tr>
<tr>
<td>Last 5 Fill Times Average</td>
<td>(20)</td>
<td>171</td>
</tr>
<tr>
<td>Pre-Pressing Air Pressure (step 15)</td>
<td>(35)</td>
<td>35</td>
</tr>
<tr>
<td>Intermediate Pressing Air Pressure (step 18)</td>
<td>(45)</td>
<td>65</td>
</tr>
<tr>
<td>Final Pressing Air Pressure (step 24)</td>
<td>(90)</td>
<td>90</td>
</tr>
</tbody>
</table>
Other Operational Changes

• Scale Removal
  – Straining 1st Carbonation scale

• 1st Carb Mud Density

• Carbonation
  – Mixed Juice tank
  – Milk of Lime addition
  – Coagulant addition
Results

• Lime Cake Sugar Loss decreased ~45%
  – 0.15% to 0.08%

• Carbonation/Filtration Station
  – Steadier Operation
  – 50% reduction in 1st Carb mud tank upsets
Questions