NPE Removal and Sodium Recovery

The installation of an integrated HPD® CRP (Chloride Removal Process) system from Veolia Water Technologies allows recovery of precipitator ash while purging contaminants from the process. The mill benefits by decreasing overall chemical makeup costs and improvements in recovery boiler operation.

An HPD CRP System Increases Mill Efficiency by:

- Reducing chemical makeup costs
- Increasing stability of mill operation with less frequent stoppages for washing
- A reduction of corrosion in the recovery boiler
- An increase of recovery boiler steam production
- Creating steam savings from reduced soot blows
- Allowing increased super-heater temperature for increased power generation

Integrate the CRP System with an HPD Evaporator Train or De-mineralized Water Heater for Additional Benefits:

- Reduced steam to the deaerator
- Increased evaporation capacity
- Decrease in steam flow to evaporators
- Decreased duty on 1st, 2nd or 3rd effect evaporators to reduce potential fouling

As pulp mills continue to improve spill collection and pulp washing efficiency, removal of non-process elements from the recovery cycle becomes a critical issue.

Non-process elements, including chloride and potassium from the wood and chemical makeup, accumulate in the recovery cycle, adversely impacting the operation of the boiler.

Problems caused by this accumulation include plugging in the super-heater, corrosion in the recovery boiler and increased steam demand. Mills have addressed the problem by purging precipitator ash, which causes the added expense of soda makeup. The CRP™ System offers a more efficient solution.
The CRP System takes advantage of the fact that chloride and potassium are enriched in the recovery boiler fume. As a result, the best way to manage chloride and potassium is to treat the subsequent precipitator ash.

The CRP System dissolves precipitator ash in condensate and feeds it to an evaporative crystallizer. As the water evaporates, sodium sulfate and, depending on the ash composition, sodium carbonate crystals are precipitated.

The resulting slurry is transferred to the centrifuge where the crystals are de-watered, washed and returned to the black liquor for chemical recovery.

The centrate, with the concentrated chloride and potassium, recirculates back to the crystallizer and is partially purged to remove these components from the liquor cycle.

### Removal Efficiency

<table>
<thead>
<tr>
<th>Component</th>
<th>Efficiency</th>
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</thead>
<tbody>
<tr>
<td>Chloride Removal</td>
<td>95-99%</td>
</tr>
<tr>
<td>Potassium Removal</td>
<td>95-99%</td>
</tr>
<tr>
<td>Sodium Recovery</td>
<td>85-93%</td>
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</tbody>
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