Technologies Available for
Wet to Dry Bottom Ash Conversions

By:
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McIlvaine Company Hot Topic Hour
“Update on Coal Ash and CCR Issues, Standards and Solutions”

Bottom Ash in the News
Plants that are considering a wet to dry bottom ash conversion (or ash pond elimination) have the following options:

- 1) Divert the flow of the existing bottom ash slurry piping to new dewatering bins.
- 2) Divert the flow of the existing bottom ash slurry piping to a remote submerged scraper conveyor (RSSC) system (ASHCON™).
- 3) Replace the bottom ash hopper system with a submerged scraper conveyor (SSC).
- 4) Replace the bottom ash hopper system with a dry ash conveyor (DRYCON™).
Option-1  Divert the flow of the existing bottom ash slurry piping to new de-watering bins.
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De-Watering Bin System

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little to NO outage</td>
<td>Not a dry system!</td>
</tr>
<tr>
<td>Original Ash Hopper Remains</td>
<td>Original Ash Hopper Remains</td>
</tr>
<tr>
<td>40 year old technology</td>
<td>40 year old technology</td>
</tr>
<tr>
<td></td>
<td>High Power Consumption</td>
</tr>
<tr>
<td></td>
<td>Leaking Gates</td>
</tr>
<tr>
<td></td>
<td>Plugged De-Watering Screens</td>
</tr>
<tr>
<td></td>
<td>No Gain in Boiler Efficiency</td>
</tr>
</tbody>
</table>

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**Option-2**  Divert the flow of the existing bottom ash slurry piping to a remote submerged scraper conveyor (RSSC) system (ASHCON™).

**Patent Pending**

ASHCON™ (RSSC)
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**ASHCON (RSSC) Systems**

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little to NO outage</td>
<td>Not a dry system!</td>
</tr>
<tr>
<td>Original Ash Hopper Remains</td>
<td>Original Ash Hopper Remains</td>
</tr>
<tr>
<td>Small foot print</td>
<td>High Power Consumption</td>
</tr>
</tbody>
</table>

**Bottom Ash Slurry Lines**

**Dewatered Bottom Ash**

**Truck Loading Equipment**

**ASHCON™ CONVEYOR**

Patent Pending
Option-3 Replace the bottom ash hopper system with a submerged scraper conveyor (SSC).
## Submerged Scraper Conveyor (SSC)

### SSC Systems

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well established technology</td>
<td>Not a dry system</td>
</tr>
<tr>
<td>Minimal water usage</td>
<td>Major outage required</td>
</tr>
<tr>
<td>No other de-watering required</td>
<td>Can go 100% dry for same cost</td>
</tr>
<tr>
<td></td>
<td>No Gain in Boiler Efficiency</td>
</tr>
</tbody>
</table>
Option-4  Replace the bottom ash hopper system with a dry ash bottom conveyor (DRYCON™).
Combustion Chamber: -.5 to -2.0” H₂O

Radiant Heat
Ash: 1400-1600°F

Air: 640-1310°F
(Approx 1-2% of combustion air)

Ambient Cooling Air
Air Volume: 45-70%

Ambient Cooling Air
Air Volume: 30-55%

Boiler Efficiency Can Increase ~ 0.02 to 0.07%

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New Dry Bottom Ash Hopper

New Jaw Crushers to break up ash clinkers

Air Intake Valves

Incline Section

Rollers for conveying pans

Access Doors

Access Stairs
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A Completely Dry Bottom Ash System

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#### Dry Bottom Ash System

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Established technology</td>
<td>Major outage required</td>
</tr>
<tr>
<td>Zero water usage</td>
<td>Needs clear path from under boiler</td>
</tr>
<tr>
<td>Reduced Maintenance</td>
<td></td>
</tr>
<tr>
<td>Complete pond elimination</td>
<td></td>
</tr>
<tr>
<td>Gain in Boiler Efficiency</td>
<td></td>
</tr>
<tr>
<td>Reduce LOI in bottom ash</td>
<td></td>
</tr>
<tr>
<td>Reduced power consumption</td>
<td></td>
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</table>
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