Improving ESP Performance in a SHORT TIME
Unit #9 is an 80 MW Combustion Engineering PC boiler built in the 1950’s. In recent years, the boiler was converted to fire 8900 Btu/lb PRB coal. Early particulate removal consisted of a mechanical dust collector. In 1976 a single chamber, 3-field PC Walther, ESP was added downstream of the dust collector.
Kansas Power & Light
Tecumseh Station – Unit #9

The rebuilt Unit uses the same casing as the existing ESP, but with internals converted from tumbling hammer to top-rapped design. The other design changes are:

<table>
<thead>
<tr>
<th>Old</th>
<th>New</th>
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</thead>
<tbody>
<tr>
<td>3 Mechanical fields</td>
<td>6 mechanical fields</td>
</tr>
<tr>
<td>12” CE spacing</td>
<td>16” CE spacing</td>
</tr>
<tr>
<td>Conventional TR’s</td>
<td>SMPS</td>
</tr>
<tr>
<td>Opacity 15-20%</td>
<td>Opacity &lt;&lt;10%</td>
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This is the first start-up of SEI’s new ESP design concept, with 3 design improvements combined into a single ESP installation:

- SEI/ELEX rigid discharge electrodes
- NWL Switchmode power supplies
- Wide (16”) collecting plate spacing

Preliminary indications are that the effects of this combination are quite synergistic, and that this concept could be applied to a broad range of applications. Formal performance testing will take place the week of July 13.
Pre Outage work to pre-assemble the roof extension and penthouse.
This shows that the unit was originally a tumbling hammer design.
Day 4
Starting to remove the old collecting electrodes
Day 7
Internals removal complete
Day 7
Finishing the flanges to accept the roof girders and ring girders
Day 8
Lifting the pre-assembled ring/roof girder
Day 8

Lowering the pre-assembled ring/roof girder onto the prepared flange
Day 12
Lifting a bundle of new Collecting electrodes
Day 12
Installing the new Collecting electrodes
Day 20
Pre-assembling the weather enclosure
Day 20
Starting to install the hot roof
Day 23
Hot roof installation complete
Day 24
Installing the CE rapper sleeves
Day 25
Insulating the weather enclosure
Day 25
Rappers, T/R sets installed, LV wiring started
Day 27
Nighttime lifting of weather enclosure
Day 28
Weather enclosure in place - finish LV wiring
Day 29
Rebuild complete
Ready for Startup
Startup Successful
After 4 week outage

05/15/2008