

SUCCESS STORY

Low NOx Burners and Coal Spreaders

Wisconsin Electric Power Valley Generating Station

PLANT SPECIFICATIONS

- Largest US cogeneration facility producing electricity and steam.
- Generates steam heat to almost 460 customers in downtown Milwaukee.
- Supplies 280 MW from two coal-fired units.
- Utilizes Riley CCV Burner with axial swirl spreaders.
- Burner capacity 50–250 MMBtu/hr.
- 70% reduction in NOx emissions — equivalent to 0.068kg/MMBtu.

THE RESULT

- Burner operating conditions: 426 °C.
- Coal velocity: 30.48mps.
- Ash content: 9% — comprised of 80% silicon dioxide and aluminum oxide.
- Stellite weld overlay: 38mm erosion after 22 months operation.
- Silicon carbide ceramic: 1.77mm erosion and significant cracking and spalling.
- Kennametal WC cladding — 0.177" erosion.
- Kennametal increased service life to 48 months with low NOx emissions.
- Generation revenue gains = \$3.63 million/year.



Silicon Carbide Spreader

Protected with Kennametal Cladding

Dynegy Power Corporation Wood River Generating Station

PLANT SPECIFICATIONS

- 650 MW boiler.
- T-fired boiler with balanced draft.
- Powder River Basin coal (low Btu high ash content).
- Burner velocities — 24.3mps.

THE RESULT

- Chrome carbide weld overlay increased service life to 8–9 months.
- Kennametal WC cladding increased service life to 48 months.
- Other materials tested using ASTM G73 test* with 73mps particle velocity:
 - Stellite 6/31 weld overlay
 - Chromium carbide coating
 - A532 casting
 - Silicon carbide ceramic tile
- Above materials showed material loss of 1.15g–2.36g.
- Kennametal WC showed material loss of only 0.21g.

* Conducted by EPRI — Electric Power Research Institute



Protected with Standard
Weld Overlay

Protected with Conforma Clad™ Cladding

**Kennametal WC showed material loss of only 0.21g.
Generation revenue gains = \$3.63 million/year.**

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