



Eliminating De-Rate and Maximizing Fuel Flexibility

Environmental Energy Services, Inc. (EES) conducted a successful demonstration on a 750MW tangential fired PC boiler using EES[®] CoalTreat[™] technology for controlling slag in PRB boilers. The objective of the demonstration was to reduce molten slag and prevent plugging on the front face of the reheat section. The CoalTreat program reduced slag considerably and enabled operations to increase generation by approximately 3% while reducing NO_x levels. EES' high temperature probes (HTP) were used to verify slag buildup rates and slag composition with respect to baseline conditions. Although the scientific principals and mechanisms of the treatment are beyond the scope of this abstract, it can be concluded that CoalTreat effectively inhibits the bond between deposits and tube surfaces without the use of major boiler system modifications or addition.

Coal Characteristics:

- Ash content of about 5.0% (avg.)
- B/A ratio of about 0.82 (avg.)
- Initial fusion temperatures of about 2100°F (Red.)

Highlights of the program:

- Max output of unit achieved at 785MW
- Upward trend in reheat and superheat sprays (boiler data trends)
- Reduction of NO_x levels by 0.02 lb/MMBTU
- Elevated initial fusion temperatures by over 150°F
- Elimination of black glass on tube surfaces as indicated on HTP probes.



EES completed a CoalTreat test burn with various blends of Wild Boar Illinois Basin (IB) coal and Central Appalachian (CAPP) coal on the test unit. The test ran for one full week.

The unit operated without issue up to 100% IB using CoalTreat. Boiler parameters remained constant during the demonstration with the exception of a slight increase in Re-Heat temperatures and a slight decrease in APH and SCR differential pressure during the trial.

High Temperature Probe (HTP) tests demonstrated minimal slagging with CoalTreat. Samples that were collected were high in reduced iron as expected and very friable. Slagging rates were minimal compared to other IB test coals EES has tested in the past.

100% IB with CoalTreat responded the best with respect to increasing fusion temperatures when compared with lower blends of IB (50-85%). Increases in fusion temperatures of up to 200°F or higher were noted in the HTP sample data sets for the 100% IB test runs.

Switching from CAPP to IB saved the plant \$40/ton in fuel costs.