

# FuelSolv\* FMG2960 Improves Reliability and Productivity, Saving China Power Plant \$50,000

## Challenge

A coal fired boiler in a cogen plant in Eastern China experienced severe slagging in the boiler combustion chamber. This forced the plant to shutdown the boiler for mechanical cleaning every 2 to 3 months – or sometimes in as short as 20 days in the most severe situation.

Stack gas temperature increased from 165° to 195 ° C (329 to 3542° F), resulting in significant drop in boiler thermal efficiency. The poor heat transfer due to the heavy slagging caused the temperature in furnace to increase from 750 ° to 950 ° C (13,532 to 17,132° F). The high operating temperature in the furnace shortened the service life of superheaters as it increased the tube skin temperature and, made them susceptible to overheating. The boiler reliability and safety ultimately was affected.

The severe slagging also caused operational problems resulting in production delays and production losses, which necessitated extraordinary measures to minimize boiler down time.

## Solution

GE Infrastructure Water & Process Technologies introduced FuelSolv\* FMG2960, an oil-based Magnesium slurry product to control slag deposition and fouling. The product worked by increasing the melting point and friability of deposits formed from the ash constituents in the coal during combustion process. This made them easier to remove during normal soot blowing and out-of-service cleaning. The catalyst contained in FMG2960 can help to improve coal combustion efficiency.

After treatment, the fouling/slagging problem was reduced dramatically. Temperature profiles in the furnace and exit flue gas were maintained consis-

tently at about 200 ° C (3632° F) and 15 ° C (302° F) lower respectively compared to operating the boiler with heavy slag.

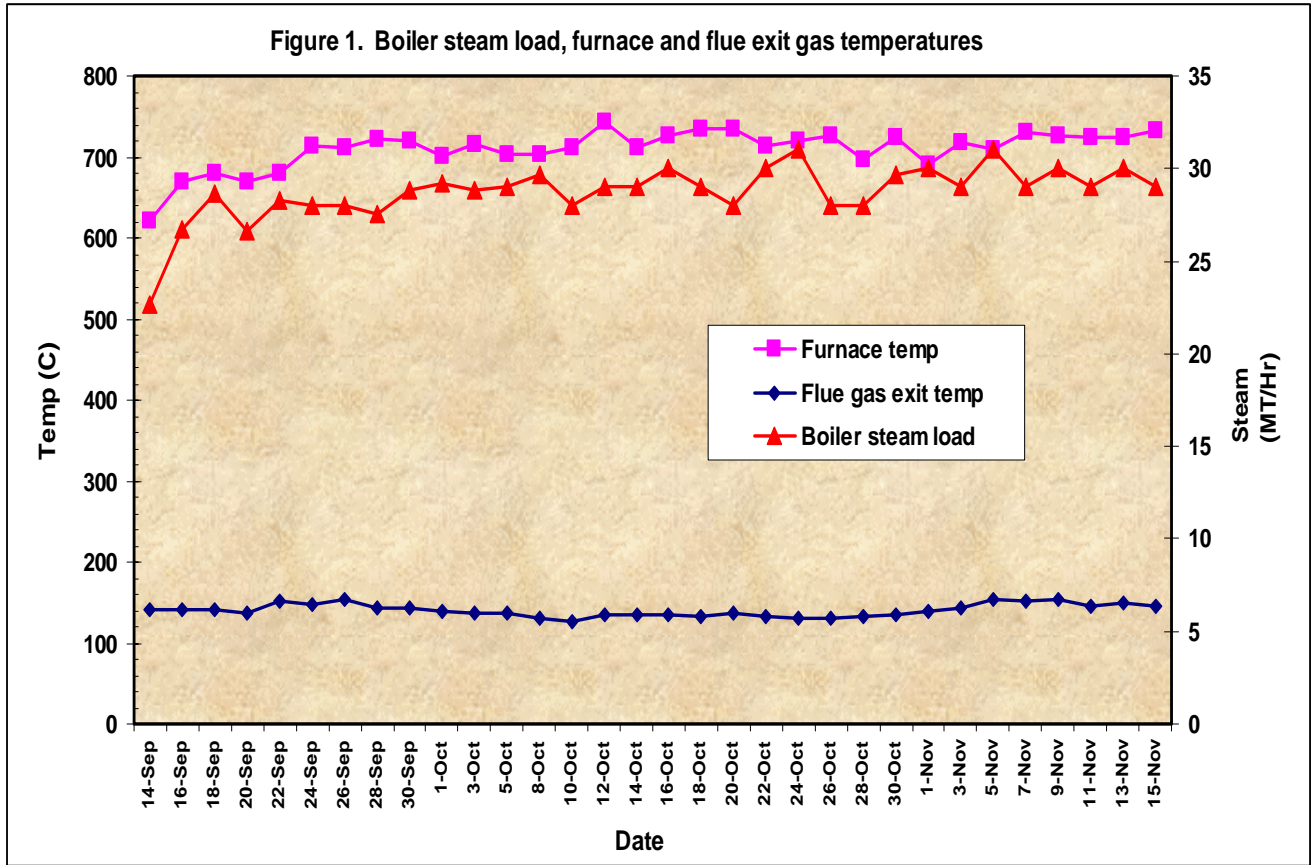
Figure 1 shows the boiler steam load, furnace and exit flue gas temperatures trends after 2 ½ months treatment with FuelSolv\* FMG2960.

Figure 2 shows the combustion chamber after treatment.

## Results

- > The boiler was able to operate continuously without any shutdowns for mechanical cleaning to remove slag.
- > Slagging problem in boiler combustion chamber was reduced dramatically.
- > The flue gas excess oxygen was reduced 5%.
- > Exit flue gas temperature was decreased 10° to 15 ° C (50° to 302° F).
- > Temperature in furnace was maintained at design level, 200 ° C (3632° F) – lower than under the slagging condition thereby extending the service life of superheaters and boiler.
- > The net annual savings after expenses were estimated at \$50,000 USD per year.
- > The reliability and safety of boiler was improved.
- > Smoke emission was reduced as a result of improved combustion.





**Figure 2. Combustion chamber after treatment**

