



## LP Amina LNB+SOFA Technology Shajiao C, Guangdong, China

- > *NOx reduced from 0.6 lbm/MMBtu to below 0.24 lbm/MMBtu*
- > *CO emission reduced to < 60 ppm*
- > *Boiler efficiency at pre-retrofit levels*
- > *Increased coal flexibility*

## Shajiao C Power Plant

Located in Dongguan city, Guangdong province, Shajiao C is a large-scale coal-fired power plant, with a total capacity of 2000MW. Its parent company Yuedian Group is one of the biggest private power generation providers in Guangdong province and a long-time partner of LP Amina in China. Prior to this retrofit, LP Amina had successfully installed multiple De-NOx technologies at Yuedian's Shajiao A Power Plant located in the same city. For Shajiao C retrofit, LP Amina proposed its proprietary LNB+SOFA solution, and managed to successfully reduce emissions below contract levels.

### Customer & Location

Shajiao C, Guangdong Yuedian Group  
Humen Town, Dongguan, Guangdong province

### Plant Equipment

Built in 1996. Pulverized, coal-fired unit of 3×660MW  
T-fired boiler consisting of ABB-CE products  
HP, IP, LP steam Turbine unit consisting of GEC-ALSTOM products

### Objectives

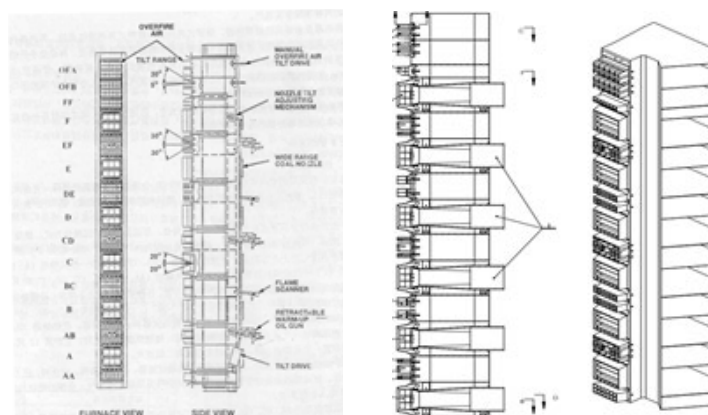
- Reduce NOx from 0.6 lbm/MMbtu (O<sub>2</sub>=6%) to <0.28 lbm/MMbtu
- Post retrofit CO should be less than 100 ppm (APH 3% O<sub>2</sub>)
- Fly ash content should remain unchanged and not exceed the pre-retrofit level of 1.5%
- Maintain same boiler thermal efficiency after the retrofit

### Challenges

- Narrow boiler on the inside, making SOFA arrangement more difficult
- Strict NOx emission standards for in-furnace retrofit
- Tight timeline for design

### LPA Solution

During the initial design phase, LP Amina used advanced CFD technology to simulate scenarios of pressure drop in the SOFA duct and coal distribution flow in the nozzle area of the burner. This data provided theoretical support for a successful proposal and further solution implementation. In order to minimize project cost, the client discouraged procurement of large-scale equipment. Therefore, LP Amina's solution focused on redesigned nozzles and an offset air system. The solution reshaped and adjusted the direction of the nozzles that controlled coal output and mixing. The second part of the solution included the installation of LP Amina's proprietary SOFA system. The team installed SOFA nozzles at specific elevation points to create staged and stable combustion. The new nozzles layout expanded the main combustion area, which decreased heat and reduced amount of NOx generated in the furnace.



Burner nozzle layout comparison before and after the retrofit



Shajiao C power plant



LP Amina's team on site



Installed air duct of SOFA

### Results

After the retrofit, NOx emissions were below 0.24 lbm/MMbtu, exceeding the guaranteed level of 0.28 lbm/MMbtu. CO emission after the retrofit averaged 60 ppm, far lower than the guaranteed level of 100 ppm.