



Clean combustion. Powerful results.

# CASE HISTORY

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## COEN LOW NOx CPF-LN BURNER

### BACKGROUND

IBM Corporation in San Jose, California decided to upgrade their existing boiler with a new **Coen Low NOx CPF-LN** burner to meet the new emission requirements issued by the Bay Area Air Quality Management District (BAAQMD). The BAAQMD requirements need not be met until January 1, 1996, but IBM decided to be the environmental pacesetter among local industries and **complied a full 2-1/2 years before the deadline.**

- Name:** IBM Corporation
- Location:** San Jose, California
- Boiler:** Babcock & Wilcox, FM10-52
- Capacity:** 36,000 PPH Steam
- Burner:** Coen Model CPF-LN
- Fuels:** Natural Gas & #2 oil

### SOLUTION

IBM was able to take advantage of existing compatible Coen equipment when converting their boiler to low NOx operation. The existing burner's windbox, fuel piping, and controls were supplied by Coen in 1981 and could be reused in the conversion. The replacement equipment included a new CPF-LN low NOx burner, a larger air fan and an inlet box to induce flue gas recirculation (FGR).

The entire installation, start up and compliance testing of the new equipment was done very smoothly and quickly with minimal impact on the plants operation. The actual start up on two fuels was completed in less than one week.

For backup purposes the burner was designed with gas/oil changeover without shutdown, and low NOx regulations on oil as well as gas were met which is very important in a production facility such as this.

### RESULTS

IBM's leadership and sound environmental thinking really paid off. Not only did the Coen CPF-LN Low NOx burner meet the future regulations, but it actually exceeded them by a wide margin. The City of San Jose is fortunate to

have such environmentally conscious industries such as IBM.

- ✓ **LOW NOx**  
NOx emissions at full capacity as measured by an independent agency were 21 ppm which is 30% below the BAAQMD regulation of 30 ppm.
- ✓ **LOW CO**  
Carbon monoxide emissions were an astounding 4-ppm at full load. This is many miles below the 400 ppm limit.
- ✓ **HIGH EFFICIENCY**  
In the past, going to Low NOx burners meant losing a little efficiency because excess air levels would increase. This is no longer the case. The above levels of NOx & CO were met with 1.7% O<sub>2</sub>.
- ✓ **FLEXIBILITY IN FUEL CHOICE**  
All the requirements of the BAAQMD regulations were met with #2 fuel oil as well as gas.
- ✓ **TURNDOWN**  
Not only did the burner perform at full capacity, but all the BAAQMD regulations were met at lower turndown levels of 10 to 1.

### FIELD TEST RESULTS

EMISSIONS	REGULATIONS	BAAQMD ACTUAL
NOx	30 ppm	21 ppm
CO	400 ppm	4 ppm
O <sub>2</sub>	3.0%	1.7%

### LOW NOx LESSONS LEARNED FROM IBM CORPORATION

CUSTOMER NEEDS	OPERATIONS	AIR QUALITY
Meet Future Regulations	High Efficiency	21 ppm NOx
Utilizing Existing Equipment	Low Excess Air	4 ppm CO
Quick Startup	High Turndown	Low Cost per ton of NOx removed
Local Supply	Multi-Fuel	