

DELTA-NO_x ULTRA LOW NO_x BURNER ACHIEVES 9 PPM

SITUATION

The NRG Energy Center San Francisco (ECSF) needed to add a new boiler to meet the increasing steam demand within their district heating system in the heart of downtown San Francisco. The ECSF operates continuously, supplying several hundred downtown hotels and office buildings with steam for heating and hot water use. The Bay Area Air Quality Management District (BAAQMD) has implemented strict emissions regulations for new boiler installations of < 9 ppm NO_x and < 50 ppm CO. The ECSF needed a highly efficient boiler that would meet the strict BAAQMD emissions regulations.

Additionally, the boiler needed to be capable of both base loading and swing loading operation while still providing traditional and reliable turndown ratios. The installation location for the new boiler also provided several unique challenges associated with space constraints, neighborhood noise concerns, intake and exhaust ducting obstacles, and environmental issues that precluded most traditional 9 ppm NO_x solutions.

Name:	NRG Energy Center
Location:	San Francisco, CA
Boiler Supplier:	Nationwide O-Type
Capacity:	80,000pph
Burner:	Delta-NO _x ULN-30
Fuel:	Natural Gas
Emission Limits:	9 ppm NO _x , 50 ppm CO
Heat Release:	99.9 MMBtu/hr

SOLUTION

NRG selected Nationwide Boiler to provide an O-type watertube boiler with a COEN **Delta-NO_x ULN** burner package capable of meeting the strict BAAQMD emission regulations. The burner was equipped with a standard **BMS-2000** PLC-based Burner Management System. With combined efforts from NRG, COEN and Nationwide Boiler engineers, several design features were taken into consideration to accommodate the installation challenges at ECSF, including boiler



Delta-NO_x ULN Burner

placement, a remote mounted FD fan, remote mounted combustion controls and BMS panel, flue gas ducting issues, noise attenuation issues, and stack draft controls.

The design of the burner also afforded ECSF the option of utilizing common loop controllers for all boiler automation functions. In fact, the combustion control logic was simplified to the point that only a single controller was required for firing rate and fuel-air control. This reduced the complexity of the project, and kept the installation cost down.

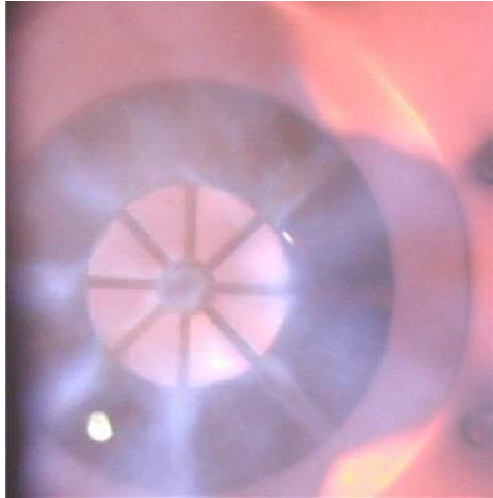
RESULTS

Performance of the burner exceeded all customer expectations including the following:

- **Low NO_x** - maintained < 9 ppm throughout the operating range.
- **Low CO** - maintained < 50 ppm CO throughout the operating range.

- **Low Excess Air** – Emissions were met with 15% excess air.
- **Robust Operation** – this is now the quietest and most reliable boiler in the plant.
- **Simple Controls** – the boiler is very easy to operate.

One of the installation constraints was that the boiler had to be set outdoors, which raised concerns regarding neighborhood noise levels. However, the actual results are that the boiler is quieter than the ambient street noises. The plant operators now report that they can't tell that the boiler is firing without looking at the flame.



Robust Delta NOx-ULN Flame



Simple BMS & Control Panel

CUSTOMER NEEDS

- Meet Tough Emission Limits
- Simple Installation Requirements
- High Turndown
- Fast Load Swing Capability

OPERATIONS

- High Efficiency
- High Reliability
- Simple Operation

AIR QUALITY

- Sub 9 PPM NOx
- Low CO
- Low Excess Air

Strict Federal air pollution regulations create great economic challenges that make it more difficult to remain competitive in a fierce global environment. It is no longer an option, but a necessity for industry to pursue and implement the latest technology providing both economic and environmental benefits.

Since Coen Company has been producing combustion equipment for over 90 years we understand this trend. Coen is committed to providing the latest in combustion and emission control technology to meet the needs of today's tight boiler designs and tomorrow's emissions.

For more information about this case history or Coen equipment, contact Coen Company, Inc. or your local Sales Representative.



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