

QLN STEAM FLOOD ACHIEVES 12 PPM

SITUATION

AERA Energy needed to meet the San Joaquin Valley Unified Air Pollution Control District's new emission requirements (Rule 4305) of 30 ppm NOx and 100 ppm CO on steam generator installations. AERA Energy in Bakersfield, CA decided to use Coen's new **Quantum Low NOx "QLN" burner**. It was desirable to retrofit to a burner that had lower combustion fan BHP and would meet NOx levels without the use of expensive flue gas recirculation.

Name:	AERA Energy
Location:	Bakersfield, California
Steam Heater:	Natco, Struthers, etc.
Capacity:	62,500,000 Btu/hr
New Burner:	New Coen Model "QLN"
Fuels:	Natural Gas and Casing Gas
Limits:	30 ppm NOx; 100 ppm CO

SOLUTION

Coen delivered new Coen "QLN" burners as complete integrated packages that easily mounted up to the front of the steamers with some burner throat modifications. The old 50 HP fans were removed and saved for parts on other units. **The existing controls, piping and flame safeguards were reused** which truly helped reduce the retrofit costs. The lower pressure drop of the "QLN" with its efficient fan wheel requires only 30 HP versus 50 HP consumption on nearby steam generators.

Operation and maintenance of the burner is simple. The "QLN" has no moving parts. Once it's adjusted at startup, you can forget it. **The single point positioning controls for the air damper and Coen "AC" fuel valve are reliable and easily interface with existing equipment.**

This control package has been proven in many installations worldwide.

The primary benefit of the new "QLN" burner is that it **doesn't require flue gas recirculation**. One can avoid the added expense of a separate FGR fan or a larger primary air fan to induce FGR (some steamers use 75 HP fans). FGR operating horsepower cost, loss of thermal efficiency, and the installation and maintenance of an FGR system is eliminated.



Coen QLN Burners For Steamers

RESULTS

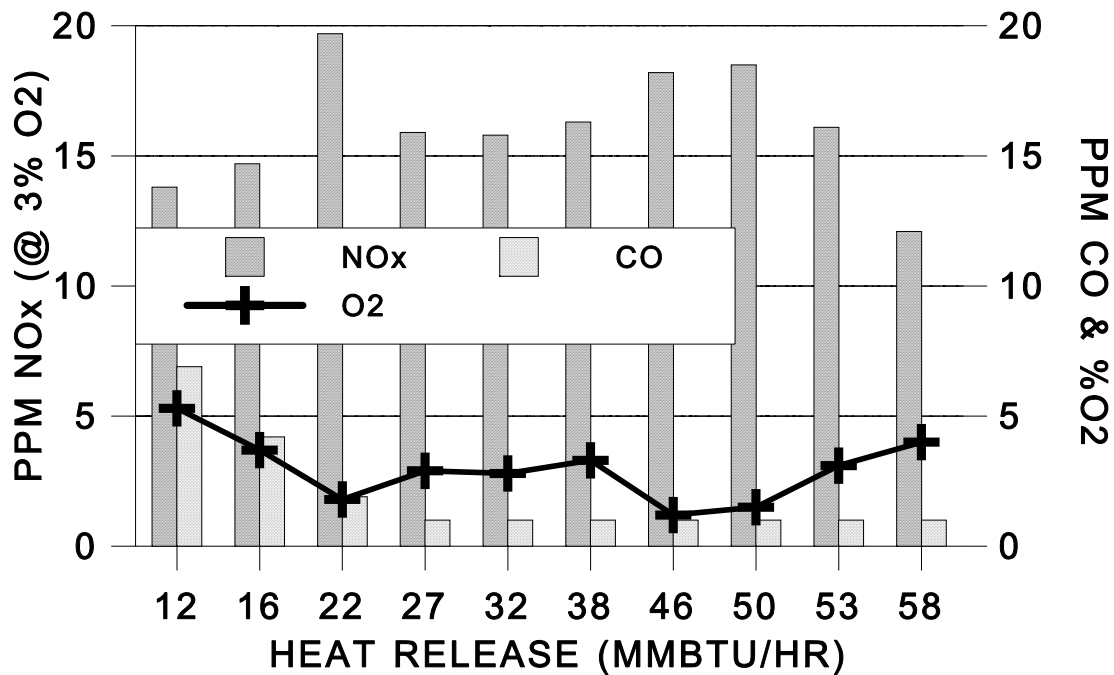
The startup results were substantially below the new emission regulated limits of 30 ppm NOx and 100 ppm CO after only two days of firing.

The conversion resulted in:

- ✓ **LOW NOx** - NOx was less than 20 ppm over the firing range and **only 12 ppm at full load** (corr. to 3% O₂).
- ✓ **LOW CO** - Again, CO was less than 7 ppm at all firing rates and **only 1 ppm at high firing rates**.
- ✓ **OFFSETS** - Achieving **lower NOx numbers** could allow AERA to reduce emission offsets surrendered for this project. At \$2000/#NOx per day, a 15 ppm NOx reduction below the limit is potentially worth \$54,000 when operating at full load.
- ✓ **LOW OPERATING COST** - Not using 15% FGR will save \$40,000/year. Replacing the 50 HP air fan with a 30 HP fan will save \$19,000/year. Combined with the NOx offsets above, the **total first year savings could reach \$113,000**. (Above based on \$.09/KWHR, \$3.50/mmbtu fuel cost, and 8400 hrs/year run time).

AERA

LOW NO_x START UP DATA



LOW NO_x LESSONS LEARNED FROM THE AERA CONVERSION

CUSTOMER NEEDS

- ✓ Met Emission Limits
- ✓ Easy Retrofit
- ✓ Quick Startup
- ✓ Local Supply
- ✓ Simple PLC Control

OPERATIONS

- ✓ No FGR Required
- ✓ Low Excess Air
- ✓ Low Fan BHP
- ✓ Low Operating Cost
- ✓ High Efficiency

AIR QUALITY

- ✓ < 20 ppm NO_x
- ✓ < 7 ppm CO
- ✓ 12 ppm NO_x at Full Load
- ✓ Future Lower NO_x

Strict Federal air pollution regulations trickling down to the district level are creating great economic challenges 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 that provides economic and environmental benefits.

Coen Company, engineers and manufacturers of combustion equipment for over 89 years, understands this trend. Coen Company is committed to providing the latest in combustion and emission control technology to meet the needs of the oil production, refining and related industries.



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