

ULTRA LOW NO_x BURNER RETROFIT SUCCESS

SITUATION

The Texas Natural Resource Conservation Commission (TNRCC) will soon implement strict NO_x emission regulations for existing industrial and utility boilers in regions of Texas. The Houston/Galveston area may see NO_x limits as low as 0.01 lb/mmBtu (< 9 PPM) for industrial boilers operating above 100 mmBtu/hr.

Thermal Energy Cooperative (TECO) operates a vintage 1960's 125,000 PPH 'A' type Riley MH packaged boiler at their Houston facility. Faced with the need to retain full capacity and meet potential future single-digit NO_x emissions, TECO decided to seek an Ultra Low NO_x Burner retrofit in lieu of costly selective catalytic reduction (SCR) type back-end clean up.

The project required a comprehensive turnkey retrofit to insure seamless installation, with sole source accountability for the entire project from demolition to installation and commissioning of the new burner equipment.

As combustion specialists for over 89 years, Coen understands that a coordinated, well-executed effort is desired with Ultra Low NO_x Burner retrofits. We also realize the importance of single point accountability from someone who knows how to do the job right the first time.

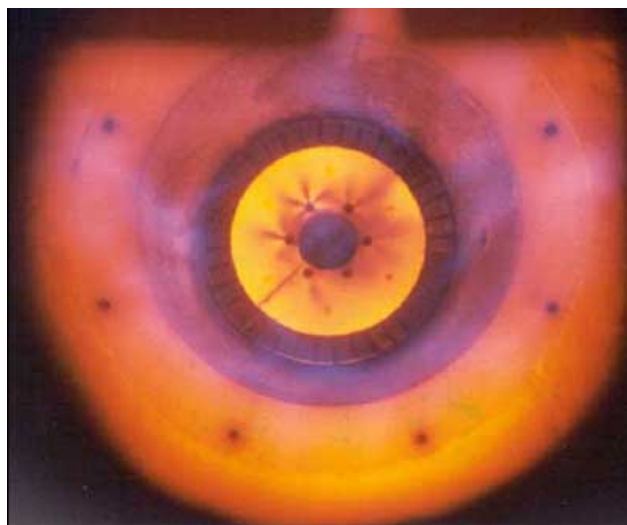
Name:	Thermal Energy Cooperative
Location:	Houston, Texas
Boiler:	Riley MH 'A Type' Packaged
Capacity:	(1) 125,000 PPH
Burner:	(1) Coen Ultra Low NO _x Burner
Fuel:	Natural Gas
Guarantees:	< 0.01 lb/mmBtu NO _x (< 9 PPM) < 0.08 lb/mmBtu CO (< 100 PPM)

SOLUTION

The successful turnkey installation included one **Coen Ultra Low NO_x Burner and Coen Fyr-Monitor combustion control system with touch screen display**. Coen supplied **new combustion air fan with transition and silencer, fuel piping train, pre-cast refractory throat assembly, and dual Coen Iscan flame scanners**.



Coen Ultra Low NO_x Assembly in Woodland, CA



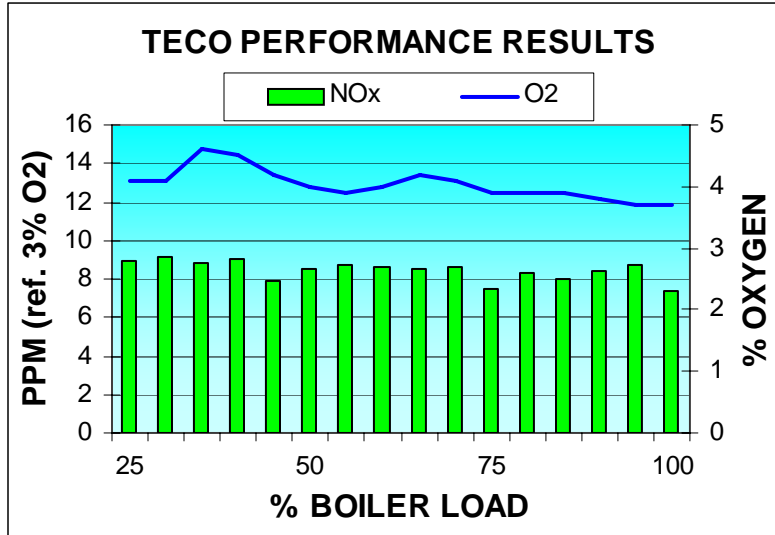
Coen Ultra Low NO_x Flame

RESULTS

Preliminary start up results proved better than expected and included:

- ☐ **LOW NO_x** -- NO_x remained below 9 PPM (corrected to 3% O₂) throughout a 4 to 1 turndown firing range with approximately 30% FGR and below 4.5% O₂

- ☐ **LOW CO** -- CO remained below 50 PPM throughout the load, near “zero” CO in some cases



CUSTOMER NEEDS

- ✓ Single Point Accountability
- ✓ Lowest Installed Cost
- ✓ Full Load Steam Capacity
- ✓ Meet Emission Regulations

OPERATIONS

- ✓ < 30% FGR Required
- ✓ 15 to 1 Turndown Achieved
- ✓ Safe Continuous Operation
- ✓ Stable Performance
- ✓ 100% Capacity Achieved

AIR QUALITY

- ✓ < 9 PPM Natural Gas NO_x
- ✓ < 50 PPM CO
- ✓ Over 4:1 Turndown Range

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 since 1912, understands this trend. Coen Company is committed to providing the latest in combustion and emission control technology to meet the needs of industry. We also offer sole source Turnkey responsibility.

