



# COEN

Clean combustion. Powerful results.

# CASE HISTORY

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## ENERGY RECOVERY FROM NON-CONDENSIBLE GASES

### SITUATION

Non-Condensable Gases (NCG's) are a by-product of the paper production process found in the majority of pulp and paper plants throughout the world. NCG's are waste gases that are toxic, explosive and are usually a burden to surrounding communities. Most NCG's are incinerated or vented to atmosphere without benefit of utilizing the heating value.

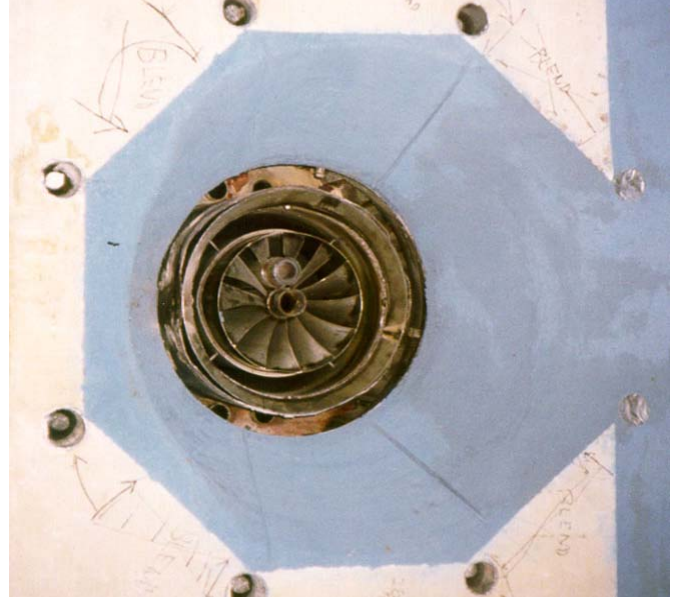
The Weyerhaeuser facility in New Bern, NC decided to increase paper production capacity by 20% by adding a new 700 ton per day Kvaerner digester. This production increase prompted Weyerhaeuser to investigate an environmentally responsible system to incinerate NCG's and benefit from their heating value at the same time. Emission limits would apply for NOx, CO, SOx, Particulate, and VOC Destruction. Another consideration was the host of sulfur constituents in the NCG's that would impact equipment selection, due to the inherent corrosive properties.

As waste incineration specialists, Coen understands that the chemical make-up of the high volume low concentration (HVLC) and low volume high concentration (LVHC) NCG's can fluctuate, causing heating value and pressure variations. Care must always be taken when considering flame stability and burner turndown performance.

- Name:** Weyerhaeuser, New Bern, NC
- Boiler:** CE 37VP16/48 Packaged Boiler
- Capacity:** 200,000 PPH
- Burner:** Coen Special "Dual DAF-34"
- Main Fuels:** #2 or #6 Oil
- Waste Streams:** HVLC, LVHC NCG, & Gasifier Gas
- Emission Limits:** 228 ppm NOx, 200 ppm CO, 3% O<sub>2</sub>

### SOLUTION

The successful design included a **Dual Coen Low NOx Burner** arrangement mounted on a new 200,000 PPH CE D-Type packaged watertube boiler. The #6 Oil and HVLC NCG are the main fuels with occasional incineration of the LVHC NCG and Gasifier Gas waste streams. Coen supplied the windbox with air damper, **Low NOx Dual DAF burners with multiple low pressure HVLC NCG ports, low pressure stainless steel interzone scrolls for LVHC NCG and Gasifier Gas**, throat tile, burner mounted fuel

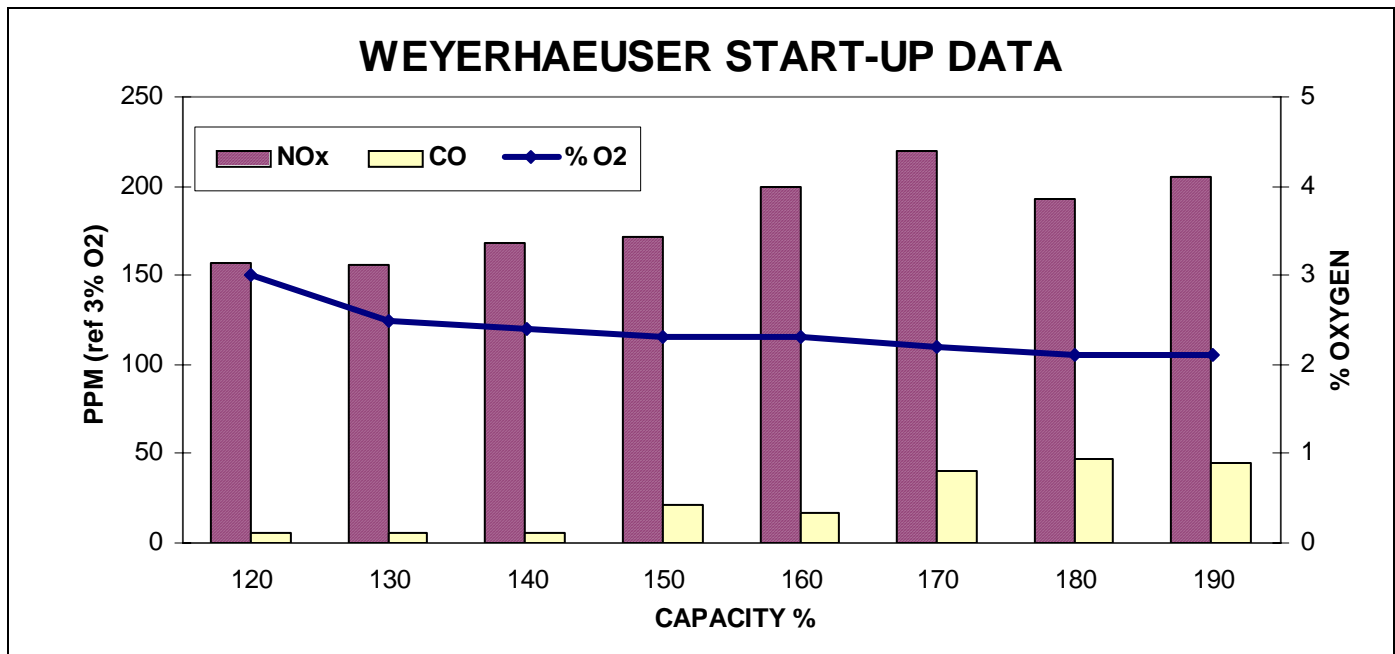


pipework with pilot gas train, oil and steam trains, **complex stainless steel HVLC and LVHC NCG fuel trains and Coen BMS-3000 flame safeguard system.**

### RESULTS

The start up produced results better than expected and included:

- LOW NOx** - NOx for #6 Oil, HVLC NCG and Gasifier Gas remained below the 0.3 lb/mmBtu emission limit without the use of FGR
- LOW CO** - CO consistently measured below 50 ppm
- LOW O<sub>2</sub>** - Oxygen levels were below 3%
- LOW GAS PRESSURE** - HVLC NCG supplied to the Coen burner at 17" w.c. (only ~1/2 psig)
- LOW OPERATING COST** - Free by-products from the paper process, low excess oxygen levels and no FGR resulted in a very cost effective operation
- ENERGY RECOVERY** - Combusting the collected waste streams lowered the overall cost of compliance



#### CUSTOMER NEEDS

- ✓ Eliminate NCG's
- ✓ Meet Emission Limits
- ✓ Low Operating Cost
- ✓ Local Representative

#### OPERATIONS

- ✓ Safe Continuous Operation
- ✓ Low NCG Pressures
- ✓ 100% Capacity Achieved

#### AIR QUALITY

- ✓ < 0.3 lb/mmBtu NOx
- ✓ < 50 ppm CO
- ✓ < 3% Excess Oxygen

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, producers of combustion equipment for over 85 years, understands this trend. Coen Company is committed to providing the latest in combustion and emission control technology to meet the needs of industry in utilizing alternative fuels like Non-Condensable Gases.

