Babcock & Wilcox (B&W) has successfully used the low NO\textsubscript{X} XCL-S\textsuperscript{®} burner in low NO\textsubscript{X} oil and gas applications since 1988. This advanced low NO\textsubscript{X} burner was developed to achieve superior NO\textsubscript{X} performance in burner-only applications and in applications using overfire air (OFA) and/or flue gas recirculation (FGR). Proven performance with more than 5,400 megawatts of experience gives us confidence in achieving the results our customers need.

Each oil and gas low NO\textsubscript{X} XCL-S burner is completely shop assembled and mechanically tested before shipment. The XCL-S burner is designed as a simple plug-in, with little or no modifications needed to the rest of the boiler. B&W’s system approach provides the engineering know-how needed to meet your boiler’s NO\textsubscript{X} reduction requirements, without adversely affecting boiler performance.

B&W’s low NO\textsubscript{X} XCL-S burner offers:

- Proven performance
- Demonstrated NO\textsubscript{X} reductions in excess of 90 percent
- Demonstrated low NO\textsubscript{X} emissions with and without the use of FGR
- Superior flame stability and burner turndown
- Lower CO emissions
- Improved excess air control
- On-line adjustability to optimize performance
- Low-cost plug-in design
- Proven mechanical reliability and operation
- Complete shop assembly – ready for installation

High temperature alloy steel is used in all parts of the burner exposed to radiant furnace heat. The burner for this retrofit is rated at 130 million Btu/hr (38 MW\textsubscript{t}) on gas and 118 million Btu/hr (35 MW\textsubscript{t}) on heavy fuel oil. The burner shown here weighs approximately 3,500 pounds (1,590 kg) and is equipped with shop-attached lifting lugs for easy one-piece installation.
Each design feature incorporated in the low NO\textsubscript{x} XCL-S burner has been refined to allow maximum NO\textsubscript{x} reduction with optimum combustion efficiency.
Using plug-in low NOx XCL-S burners, flue gas recirculation and a staged combustion system, NOx was reduced by ninety percent on this 350 megawatt boiler.

**System approach reduces NOx emissions**

**B&W’s NOx reduction system approach offers:**
- Flexible application of technologies to meet specific NOx emission limits
- Comprehensive analysis of the impact of a low NOx retrofit on boiler capacity and performance
- Proven technological capabilities to modify boiler pressure parts, reconfigure heating surfaces, and optimize material selection and auxiliary systems to maximize boiler performance

**Equipment description:**
- A. Gas recirculation flue
- B. FGR fan, motor and turning gear
- C. Connecting ductwork
- D. NOx port pressure part panel
- E. Dual zone OFA port
- F. FGR crossover flue
- G. Low NOx XCL-S burner
- H. Controls and instrumentation

**Retrofit equipment:**
- Flue gas recirculation
- Mixing air foils
- Overfire air ports
- Connecting ductwork (FGR/air mixture)
- Low NOx oil and gas XCL-S burners
- Open windbox (existing)

**The value of proven experience**

The low NOx XCL-S burner system approach offers significant NOx reduction capabilities across the full range of wall-fired boiler configurations and combustion firing patterns.

B&W’s leadership in the field of low NOx reduction technology began in 1962 with the first patented OFA port system design. That leadership continues with unparalleled experience, proven equipment and innovative technology. Our systems are designed to be cost-effective, dependable and adaptable to the full range of fuels and boiler arrangements in new or retrofit applications. Count on us for all your NOx emission control technology needs. For 24-hour emergency assistance, call 1-800-354-4400.

**Low NOx oil/gas XCL-S burner performance**

- A. XCL-S burner only
- B. XCL-S burner with OFA
- C. XCL-S burner with OFA and FGR
A typical low NOx oil- and gas-fire XCL-S burner. The linear actuator (at the top of the burner) moves the sliding air damper, which controls the majority of the secondary air flow to the burner. The hemispherical gas spuds can be rotated to minimize NOx emissions or removed for inspection while the boiler is in service.