

## I. INTRODUCTION

Lincoln Development Center (LDC) power plant at Lincoln has requested a revision to the permit for its gas-fired boiler to retrofit combustor to demonstrate that sulfur dioxide, nitrogen oxides and particulate matter can be reduced in a staged coal combustor.

This plant provides steam for heating and air conditioning for the center. The central steam plant was originally built with all three boilers that were designed to burn coal.

The proposed combustor retrofit boiler previously was an old coal fired boiler (#2) that was converted to gas. The combustor retrofit boiler will now be used in conjunction with the two remaining existing coal fired boilers which now will have all three boilers tied to a common baghouse.

## II. PROJECT DESCRIPTION

LDC currently operates a combination of coal fired boilers and a natural gas fired boiler. LDC's goal is to meet the majority of its steam energy needs with the retrofit boiler. The combustor/boiler will be used to respond to changes in steam demand, allowing steady-state operation of the combustor/boiler. The combustor boiler in gas mode is used when the steam load requirements are low.

In the combustor/boiler, crushed limestone is added directly into combustor with the coal and air. The combustion behaves like a coal gassifier. This provides certain combustion benefits, including reduced formation of nitrogen oxides (NO<sub>x</sub>). In addition the limestone chemically absorbs sulfur (S) directly from the gases in the combustor, reducing SO<sub>2</sub> emissions. Particulate matter (PM) suspended in the flue gas, as well as fine particulates of limestone, are captured by a fabric filter, also know as a baghouse.

Particulate matter emissions from the existing coal fired boilers at LDC are currently controlled by multiclones. These boilers would have in addition, a common baghouse when the combustor/boiler is constructed.

The emissions of the combustor/boiler are listed below. Potential emissions are calculated based on limited operation at the maximum load. Actual emissions will be much less to the extent that the combustor/boiler will not operate year around and will operate at less than the maximum rate.

<u>Contaminant</u>	<u>Emission (Ton/Yr)</u>
Sulfur Dioxide	151.2
Nitrogen Oxides	18.9
Carbon Monoxide	28.7
Particulate Matter	12.6

A small amount of particulate matter will also be released from the storage and handling

of coal, ash and limestone.

### III. APPLICABLE EMISSION STANDARDS

All emission sources in Illinois must comply with Illinois Pollution Control Board emission standards. The Board's emission standards represent the basic requirements for sources in Illinois. The retrofit boiler should readily comply with applicable Board standards

This project is also subject to the federal New Source Performance Standards (NSPS), 40 CFR 60 Subpart Dc, for industrial steam generating units of greater than 10 and less than 100 mmBtu/hr. The Illinois EPA is administering NSPS in Illinois on behalf of the United States EPA under a delegation agreement. The NSPS sets emission limits for sulfur dioxide and particulate matter emissions from the combustor/boiler. Testing, recordkeeping, reporting and continuous emissions monitoring are also required.

A major project is one which entails construction of a major source or major modification, i.e., a significant net increase in emissions of an attainment contaminant at an existing major source. This project is not considered a major modification. For emissions of nitrogen oxides, sulfur dioxide, carbon monoxide and particulate matter the net increase accompanying the operation of the retrofit boiler with two existing boilers compared to previous historical levels is decrease in emissions as discussed in more detail below.

### IV. HISTORICAL BACKGROUND

The LDC has two travelling grate coal fired boilers #1 and #3 with a maximum firing rate of 38 million btu/hr each and an average firing rate of 25 million btu/hr. Each boiler currently has a multiclone system for particulate control, and only one boiler is used at a time. The steam produced is process steam only.

Boiler #2 used to be coal fired stoker which was converted to gas in 1996 with a maximum firing rate of 48 million btu/hr and an average rate of 24 million btu/hr.

The net change in emissions accompany the project is shown below. The emissions for the existing boilers are based on average actual data and using standard emission factors from previous representative years. This evaluation was made in terms of emissions of nitrogen oxides, sulfur dioxide and particulate matter. This evaluation describes the potential change in emissions for the purposes of regulation applicability. The modified and improved facility includes existing boilers #1 & #3 and combustor retrofitted boiler #2 with a common baghouse for these three boilers. Boilers #1 and 3 currently do not exhaust through a baghouse. Existing facility emissions reflect the actual emissions or emissions based on standard USEPA emission factors for three year period from June 1996 through May 1999.

Operating Permit 72120033 issued March 13, 1996 covers operation of these boilers in concurrence with this permit for combustor/boiler.

TABLE 1

Emissions Summary in Context (Tons/Yr)

	<u>NO<sub>x</sub></u>	<u>SO<sub>2</sub></u>	<u>PM</u>	<u>CO</u>
Revised Facility (Coal Blrs #1,#3 & retrofit blr #2)	19.8	297.3	12.6	28.7
Existing Facility (Coal Blrs #1,#3 & gas blr #2)	25.1	433.3	28.7	28.7
Net Change	-5.3	-136.0	-16.1	0.0

The potential increases and decreases from the requested revisions to the existing coal fired boilers, gas fired boiler and combustor/boiler are shown in Table I. The operation of the combustor/boiler will be co-ordinated with the operation of the existing coal fired boilers so that net significant increases in emissions of SO<sub>2</sub>, PM, CO and NO<sub>x</sub> do not occur.

The IEPA therefore is proposing to issue a revised construction permit to allow high sulfur coal usage and meet tonnage emission limitations for NO<sub>x</sub>, SO<sub>2</sub>, CO and PM on a 12 months rolling average for this modification. Emissions of NO<sub>x</sub>, SO<sub>2</sub> and CO shall be measured on a daily basis in lb/day using continuous emission monitoring system. PM emissions shall be monitored using supporting technical data.

The permit would continue to contain appropriate conditions to assure that the combustor/boiler along with coal boilers will not result in a significant net increase in emissions. Compliance with combined emission limitation on SO<sub>2</sub> and NO<sub>x</sub> will be determined from a daily computer report using data from the continuous emission monitoring and data acquisition system showing daily emissions for each boiler.

## V. REQUEST FOR COMMENTS

It is the IEPA's preliminary determination that the proposed revision meets all applicable state and federal air pollution control requirements, subject to the conditions proposed in the draft permit.

Comments are requested on this proposed action by the IEPA and the proposed conditions of the draft permit. Comments must be postmarked by February , 2000 and

should be addressed to the Illinois Environmental Protection Agency, Attention: Shashi Shah, P.O. Box 19276, Springfield, Illinois 62794-9276. If substantial public concern is shown in this matter, the Illinois EPA will consider holding a public hearing in accordance with 35 Ill. Adm. Code Part 164.

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