

REQUEST FOR ADDITIONAL INFORMATION

March 8, 2003

Indeck-Elwood LLC
Attn: Jim Schneider
600 N. Buffalo Grove Road
Buffalo Grove, Illinois 60089

Application No.: 02030060
I.D. Number: 197035AAJ
Date Received: March 21, 2002
Subject: Electric Generation Facility
Location: Drummond and Baseline Roads, Elwood, Will County

The application for construction permit referenced above lacks information necessary to determine compliance of the proposed power plant with all applicable regulations, as required by Section 9.1 and 39 of the Environmental Protection Act, 40 CFR 52.21(n)(iii), 40 CFR 63 Subpart B, 35 IAC 201.152, and 35 IAC 201.301(d).

The application cannot be fully evaluated until the following information is supplied:

1. Demonstration of Best Available Control technology (BACT)
 - a. Additional material must be provided in the BACT demonstration to address Integrated Gasification Coal Combustion (IGCC) as it is a "production process" that can be used to produce electricity from coal. In this regard, the Illinois EPA has determined that IGCC qualifies as an alternative emission control technique that must be addressed in the BACT demonstration for the proposed plant. In addition, based on the various demonstration projects that have been completed for IGCC, the Illinois EPA believes that IGCC constitutes a technically feasible production process.

Accordingly, Indeck must provide detailed information addressing the emission performance levels of IGCC, in terms of expected emissions rates and possible emission reductions, and the economic, environmental and/or energy impacts that would accompany application of IGCC to the proposed plant. This information must be accompanied by copies of relevant documents that are the basis of or otherwise substantiate the facts, statements and representations about IGCC provided by Indeck. In this regard, Indeck as the permit applicant is generally under an obligation to undertake a significant effort to provide data and analysis in its application to support the determination of BACT for the proposed plant. This information must be presented in a manner that is consistent with USEPA guidance for BACT determinations, such as USEPA's *New Source Review Workshop Manual*, to the extent it is practicable given the nature of IGCC

and the fact that IGCC would constitute an alternate production process. The Illinois EPA also encourages Indeck to supply relevant material to provide general background on IGCC and power plant projects using IGCC.

b. With respect to emissions performance, information must be provided for both the expected emission rates achieved by plants using IGCC and the emission limitations that have actually been established as BACT for these plants. (If Indeck considers that BACT emission limitations established for projects using IGCC should also be considered to represent the expected emissions performance of IGCC, Indeck must provide support to justify its position.) Emission performance information must also be provided in terms of the emission limitations established as BACT for IGCC power plants that are under construction, if any. Readily available information must also be provided from suppliers of demonstrated IGCC technology for the levels of performance that they state is achieved with their IGCC technology.

Information on emission performance of existing IGCC plants must be accompanied by information about the fuel supply to specific plants and other information about the plants that is relevant to emissions performance. In particular, available information on the sulfur content of the fuel supply to an IGCC plant must be provided, as it would be relevant to calculation of the control efficiency being achieved for sulfur dioxide. Other available operating information must also be provided, as it is relevant to an understanding of emission data. For example, other characteristics of the fuel to the IGCC plant should be provided as they have a significant role in affecting emissions. Information of specific aspects of the operation of a plant that affect emissions, such as use of a mixture of natural gas and fuel gas, should also be provided.

Based on the above information, for each relevant pollutant, Indeck must select a level of performance or range of performance that should be considered to be representative of use of IGCC at the proposed plant. Indeck must provide its basis for selecting a particular level of control, including relevant information and justification, if a selected level of performance is not the lowest level at which an emission limitation has been established for IGCC.

Information must also be provided as necessary to allow the emissions performance of IGCC and the proposed CFB boilers to be compared in identical terms, including consideration of process efficiency. Accordingly, if emission data is generally presented in terms of pound per million Btu, as is expected, this emission data must be accompanied by information on the relative efficiency of IGCC and the proposed plant in converting fuel into electricity, to allow a fair comparison of the emissions of the IGCC and CFB boiler technology.

In addition to performance of IGCC for emissions of regulated pollutants, Indeck must identify other beneficial environmental impacts from use of IGCC as an alternative to CFB boilers. In this regard, Indeck must address whether use of IGCC, would reduce emissions of pollutants that are not currently regulated under the Clean Air Act, such as carbon dioxide and ammonia, and if such a reduction would occur, provide data on the emissions levels and emissions performance for such pollutants.

Indeck must provide a summary table for the performance of IGCC for each relevant pollutant as compared to the performance of CFB boilers. This summary must provide the performance level or emission rate for IGCC for each pollutant in the terms that such data is discussed above and the performance level or emission rate for CFB with which it should be compared. As lower emission rates is identified for particular pollutants with use of IGCC, Indeck must estimate the proposed plant's annual emissions with IGCC and the amount of emission reduction that would occur compared to use of CFB boilers. This information for annual emissions should be calculated based on realistic upper-bound estimates for operation of the proposed plant with CFB boilers and may rely upon restrictions that are inherent in the operation of a large conventional coal-fired power plant, as demonstrated at similar plants. Similar information on annual emissions and emissions reduction should be provided for pollutants for which the CFB boilers would provide lower emissions than use of IGCC.

c. The additional data on IGCC that Indeck must provide must also include cost data to support an evaluation of the economic impacts of use of IGCC at the proposed power plant. While USEPA guidance for determining BACT under the PSD rules would excuse Indeck from providing cost data for use of IGCC if, with CFB boilers, Indeck is already proposing to use the "top control alternative," the Illinois EPA is requiring cost data for use of IGCC. This is because Indeck has not yet provided detailed data in the application that would allow the Illinois EPA to conclude that CFB boilers provide superior emissions and environmental performance than IGCC. Moreover, the emissions and environmental performance of IGCC may not necessarily be clearly established, given the number of pollutants that must be considered, the nature of available emission data, and the developing nature of IGCC. Accordingly, cost data and economic impacts may have a key role in determining whether or not IGCC must be used as BACT at the proposed plant.

With respect to economic impacts, IGCC as a production process is not as readily evaluated as alternative add-on control systems, as is more commonly addressed in top-down BACT demonstrations. The comparison of IGCC and CFB boilers in terms of their costs and other impacts may be presented as a supplement to the current application and Indeck need not revise material in the existing application addressing application of different control techniques to the CFB boilers. However, Indeck must supply supporting documentation for its estimate(s) of the cost of using IGCC at the proposed plant, as use of ICGG would entail changes to both emissions units and control systems present at the plant. Similar information is also required for the cost of the plant with CFB boilers, as such information has not yet been provided. This information is required as standardized methods are not available to the Illinois EPA to review cost estimates for IGCC and CFB boilers, unlike add-on control systems for which USEPA has developed cost-estimating methods. However, as general data on the cost of IGCC is available in published literature, from existing IGCC projects or from other reliable sources, that is adequate to support a comparison with the cost for use of CFB boilers, Indeck need not conduct a comprehensive or detailed evaluation of the costs for use of IGCC at the proposed plant.

Indeck must provide cost information that is on a consistent basis so that costs of IGCC can be readily compared to those of a power plant with CFB boilers. To be consistent, the basic cost data provided for IGCC plants would be most efficiently expressed in terms of net electrical output, dollars per megawatt. As cost data is obtained from existing plants, Indeck must explain its adjustments to such data to express the data in standardized form. Indeck must also attempt to provide cost data that is representative of a complete new IGCC power plant, as a new plant is proposed for Elwood. If cost data for a specific IGCC project is not complete, as certain components for a power plant were already present at its site, Indeck may elect to identify such components and provide an estimate of the costs of those components. At the same time, Indeck must provide cost data that consistently handles different components of the plant. For example, the cost data for a solid fuel handling and storage system, which is required for both IGCC and CFB boilers, must be handled in a similar manner. If the cost data for the CFB boilers excludes this system, the cost data for the IGCC plant cannot include this system.

Cost data for use of IGCC must also be provided on an appropriate basis. Cost data should be provided in terms of capital costs, annual operating costs, and annualized costs, the forms in which cost data is normally provided for a BACT demonstration. To the extent that certain types of cost data are not readily available for IGCC in quantitative form, Indeck must explain why such data is not reasonably available, and address, as feasible, the relative costs of IGCC and CFB boilers in a qualitative manner. Indeck must also explain what is addressed by the quantitative cost data that is provided, i.e., what costing elements are included, demonstrate that the data that is provided is sufficient to compare the relative costs of IGCC and CFB boilers, and generally explain the types of costs that are not addressed by such data. As feasible, Indeck must also identify and justify any differences in the standard assumptions underlying the estimated cost data that is provided for the proposed power plant using IGCC and CFB boilers, such as differences in the capital recovery factor, contingency allowances, or standard equipment life. (The annualized operating cost is based on a standardized equipment life for the type of facility, over which time the capital cost of the facility is assumed to be amortized.)

Accompanying the detailed data on costs, Indeck must provide a summary table comparing the economic impacts associated with use of IGCC and CFB boilers for the proposed plant. While summary information would usually be provided as a single annualized cost if alternative add-on control systems were being compared, this summary may compare different aspects of the estimated cost of using IGCC and CFB boilers for the proposed plant. For each aspect of cost, Indeck must provide the costs in the terms that such data is available, as discussed above, and cost converted to and expressed as an annualized cost, with explanation. If quantitative data is not readily available for an aspect of cost, the summary table should summarize the qualitative information that has been provided for that aspect of cost.

In addition to providing information on cost and economic impacts of IGCC, Indeck must also provide information explaining why any adverse economic impacts of IGCC that it identifies should be considered

unreasonable. In this regard, an initial issue that Indeck may wish to address is whether it considers IGCC to have been successfully applied at other plants with IGCC or why these other plants should not be considered similar to the plant being proposed by Indeck. As IGCC has been applied to only a limited number of power plants, Indeck may also identify characteristics or factors that are unique to those plants that made IGCC appropriate to those plants but would not be present for the proposed plant. In addition to the above information, Indeck should identify readily available objective indicators of adverse economic impacts that it believes should be applied to the proposed plant, with supporting explanation and justification. If such an indicator is in different terms than the cost data, as discussed above, Indeck must provide the relevant data for use of IGCC in the terms of the indicator, explaining how the cost data results in such a value for the indicator or how the indicator value was otherwise determined. Indeck should further explain whether factors that it believes demonstrate that impacts are unreasonable are of general applicability (i.e., also applicable for a similar plant proposed at other locations in the United States) or are site-specific.

If Indeck considers that the level of "availability" of IGCC would be a significant factor for the economic impacts of this technology, Indeck must explain the likely consequences of "low" availability for the design and development of the proposed plant and any additional costs or monetary penalties that would result. Indeck must also provide relevant background explaining what availability is, why it is generally important for electric power plants, and other possible consequences for parties other than Indeck from low availability of the proposed plant, if any. Indeck must also address any significant advantages that would accompany use of ICGG that might compensate for its low-availability, such as the revenues from sale of sulfur recovered as a byproduct of IGCC.

d. Indeck may provide information describing additional negative environmental and energy impacts that it believes would be associated with use of IGCC, as such impacts may also be considered in making BACT determinations. In addition to narrative discussion of such impacts, accompanied by supporting material, Indeck must provide a summary table that summarizes the information that it has provided for these impacts.

2. Demonstration of Lowest Achievable Emission Rate (LAER)

Information, as discussed above in Item 1(b), is also required as related to the emissions of volatile organic material (VOM) that would accompany use of IGCC. This is because VOM emissions from the proposed plant are subject to a requirement for the Lowest Achievable Emission Rate (LAER) under 35 IAC Part 203, rather than BACT under 40 CFR 52.21. For this purpose, Indeck should also address VOM emissions from additional emission units associated with fuel gasification, which would only be present if IGCC were used.

3. Demonstration of Maximum Achievable Control Technology (MACT)

Information, as discussed above in Item 1(b), is also required as related to the emissions of hazardous air pollutants (HAP), including mercury,

that would accompany use of IGCC. This is because emissions of HAP from the proposed plant are subject to a requirement for Maximum Achievable Control Technology (MACT) under Section 112(j) of the Clean Air Act and 40 CFR 63 Subpart B, rather than BACT under 40 CFR 52.21.

Four copies of this information are needed and will serve as a supplement to your application. Failure to supply the required information specified above may require the Illinois EPA to deny this permit application.

If you have any questions concerning this letter, please contact Shashi Shah at 217/782-2113.

Donald E. Sutton, P.E.
Manager, Permit Section
Division of Air Pollution Control

DES:JMS:

cc: Region 1