LMFS-07-39 A
"A Study of Lignite-Based Advanced Generation Technology Systems"
Lignite Vision 21 Program Phase V

CONTRACTOR:	Burns & McDonnell
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CONTRACT AMOUNT:	$140,000

Project Schedule – 7 Months	**Project Deliverables**
Contract Date – 07/31/2009	Status Report – 11/5/2009 (x)
Start Date – 08/6/2009	Draft Final Report – 1/19/2010 (x)
Completion Date – 02/18/2010	Final Report –5/30/2010 (x)

OBJECTIVE / STATEMENT OF WORK

The objective of this study is to address the impact of physical and chemical characteristics of North Dakota lignite on various solid fuel conversion technologies. The study will evaluate the plant performance, capital cost estimate, operational and maintenance costs, busbar costs, and operating characteristics for pulverized coal, fluidized bed, gasification and oxy-combustion technologies. Cost and operational factors will be weighted in a Kepner-Tregoe Analysis to determine the most promising system to recommend for further investigation.

STATUS

August 6, 2009 – November 5, 2009
A kickoff conference call was held on August 7, 2009. On November 5, 2009, Burns & McDonald submitted a Gantt Chart graphically depicting work activities in the six task areas.

Draft final Report
The draft final report was received and reviewed. The contractor also made an oral presentation to the Lignite Energy Council's Lignite Technology Development Workgroup summarizing the findings of this activity. Comments received from the review by the North Dakota Industrial Commission's technical representative have been forwarded to the contractor for incorporation into the final report with is expected by May, 2010.

Final Report Summary

The Advanced Lignite Generation Assessment was completed to compare various potential lignite-fired power generation technologies for a generic greenfield site in North Dakota. This analysis indicates that the Supercritical PC is the most favorable option among all those evaluated. It is not only the lowest cost option, but is also the option with operating experience with ND lignite. The Supercritical PC technology provides the lowest busbar cost, lowest capital cost, best efficiency, and lowest O&M costs when comparing the other options considered. Coming in close second from the evaluation is the ultra supercritical PC option. Although not currently used with lignite as a fuel, this technology has operating experience with other fuels. Circulating fluidized bed technology requires injection of inert material into the bed, resulting in higher variable O&M costs, and thus levelized busbar costs, that are higher than its PC counterparts. This technology has significant operating experience with lignites from other parts of North America. Oxycombustion PC is still a developmental technology and may not be a viable option for lignite-based power generation until it is proven commercially with other feedstock at the very least. IGCC continues to evaluate as one of the higher cost options. In addition, although there are a few that are in construction or planning, there is still no operating experience with a utility scale IGCC plant in the 500 MW to 650 MW range unit. Moreover, the IGCC with a Selexol system captures less CO2 than the PC option with post-combustion amine system and Oxycombustion.