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Project Manager  
Sanford Orimulsion Test Burn

Date: September 20, 1990

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Location: JEN/EDO

Subject: Orimulsion Test Burn:  
Environmental Control Systems Test Matrix

With reference to our recent conversations, the following comments are offered with regard to plans to include the ABB/CE pilot-scale lime spray dryer in the environmental control systems test matrix as part of the Sanford Test Burn:

#### Background and Status

In the FPL-sponsored preliminary engineering study carried out by Burns and Roe, lime spray drying was selected as the preferred "Throwaway"<sup>1</sup> FGD (Flue Gas Desulphurization) process for converting an oil-fired utility boiler to Orimulsion. This selection was based primarily on the estimated differences in capital costs and equipment space requirements for spray dryers in comparison to those for wet limestone scrubbers. The main disadvantages of spray drying appeared to be high operating costs, due to the cost of lime, poor sorbent utilization at high desulphurization levels, and solid waste disposal. To quantify removal efficiencies and operating costs, a pilot-scale lime spray dryer was included in the environmental control systems test matrix as part of the proposed Sanford Orimulsion Test Burn.

Arrangements were being made with ABB/CE Environmental Systems Division, who provided Burns and Roe with budgetary costs for the preliminary engineering study, to use their pilot-scale spray dryer for the Sanford Test Burn. Concurrent with the discussions with ABB/CE, it was learned that AirPol, Inc. has been selected by the U. S. Department of Energy (DOE) for a Clean Coal Technology project to demonstrate a more advanced high-efficiency spray dryer. Evidently, the AirPol system, which recirculates gases and sorbent particles, overcomes some of the inherent inefficiencies of spray dryers to achieve 90+% FGD on flue gasses from high-sulphur fuels, and offers an enhancement that might dramatically reduce operating costs. An AirPol system has already been demonstrated in a waste-energy unit in Denmark. Unfortunately, AirPol does not have a pilot-scale unit of their new system, nor could they construct one in time, to substitute for the ABB/CE spray dryer planned for Sanford.

<sup>1</sup> Desulphurization products have no commercial value and must be landfilled.

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Based on information on the AirPol system and subsequent communications with the Electric Power Research Institute (EPRI), it appears that a performance evaluation of ABB/CE's pilot-scale unit planned during the Sanford Test Burn may not be a test of "state-of-the-art" spray dryer technology. Furthermore, data that are available or which will become available through equipment suppliers, EPRI, and the DOE will provide for the design, construction, and guarantees necessary for full-scale application in a plant conversion to Orimulsion. At this time, therefore, the following recommendation is submitted to the Project Team for consideration:

Suggested Action

Eliminate the ABB/CE pilot-scale lime spray dryer (and the accompanying fabric filter, i.e., slipstream 1A) from the environmental control systems test matrix as part of the Sanford Orimulsion Test Burn in favor of an analysis of data that can be provided by EPRI and the DOE on more advanced spray dryer technologies.

Consequences of Action

While eliminating the ABB/CE spray dryer as part of the test would not reduce the overall schedule timeframe required to test the boiler, baghouses, and other equipment, it would have the benefits of reducing project budget and solid waste produced during the test. It would also tend to reduce the possibility that extra time beyond the currently scheduled 90 full power burn days would have to be requested from the agency.

KRL/er

cc: Dr. M. A. Smith, Manager  
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