PNM EXHIBIT JEC-1

Consisting of 3 pages

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J. EDWARD CICHANOWICZ

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INDEPENDENT CONSULTANT (ENVIRONMENTAL TECHNOLOGIES)

J.E. CICHANOWICZ, INC.
(July 1993-present)

J. Edward (Ed) Cichanowicz provides consulting services for utility industry clients in developing environmental control strategies to meet mandates of federal, state, and local regulatory agencies. His specialty is evaluating the technical feasibility, cost, and risk of both mature and evolving technologies to control emissions from fossil fuel generating stations. His expertise includes selective catalytic reduction (SCR) for nitrogen oxides (NOx), technologies for control of mercury and carbon dioxide (CO_2), as well as flue gas desulfurization processes for sulfur dioxide (SO_2) and sulfur trioxide (SO_3).

Mr. Cichanowicz's services can be categorized as follows:

Design and Implementation of Environmental Control Technologies

Mr. Cichanowicz has developed environmental compliance plans and equipment designs for coal-fired and natural-gas fired generating stations. Clients have included Detroit Edison, Duke Power Company, Exelon Power, FirstEnergy Corporation, Luminant, New England Power, New York State Electric & Gas Corporation, NiSource, Oglethorpe Power, Public Service Electric & Gas Corporation, Southern Company, Tennessee Valley Authority, Reliant Energy, and a number of rural co-operatives. Specific duties include evaluating the performance, cost, and risk of various control options.

Optimizing the Performance of Selective Catalytic Reduction (SCR) NOx Control

Mr. Cichanowicz has 30 years of research, design, and commercialization experience in SCR NOx control technology. He is the lead author of the publication *SCR Operating and Maintenance Guideline*, funded by the Electric Power Research Institute (EPRI), for application to coal-fired generators. Also for EPRI he authors the *Gas Turbine/Combined Cycle Post-Combustion Emission Control Best Practices Guideline*, addressing SCR and carbon monoxide controls for gas turbines. He is the lead developer of CatReact™, EPRI's catalyst management software. He has assisted over 20 utility companies in deploying SCR, including developing a process specification, evaluating supplier proposals, critiquing and witnessing flow model studies, and reviewing start-up and guarantee testing.

He has represented owners of SCR equipment in arbitration and mediation proceedings. He has been awarded three patents for a next-generation catalytic reactor to control emissions of both NOx and mercury.

Technical Analysis of Federal and State Rulemaking

Industry associations such as the Utility Air Regulatory Group, the American Coalition for Clean Coal Electricity, the American Public Power Association, and the National Rural Electric Cooperative Association retain Mr. Cichanowicz to project how power providers will respond to regulatory initiatives. Specifically, Mr. Cichanowicz and associates have developed algorithms to simulate the compliance decisions of power generators in more than 25 states to meet both federal and state initiatives for control of emissions of NOx, SO_2 and SO_3, particulate matter, and mercury. For the Ontario Ministry of the Environment, he was part of a team that developed a strategic plan to meet proposed provincial mercury legislation.

He has authored over fifty "white papers" for industry groups, among the more recent summarizing the feasibility of carbon capture and sequestration technologies for CO_2, and cost trends for environmental control equipment.

TECHNICAL PROJECT MANAGER
ELECTRIC POWER RESEARCH INSTITUTE
(1978-1993)

Duties at EPRI focused on managing research projects to develop and commercialize environmental control technologies, and improve plant performance. Specific activities included:

- developing strategies to enhance power plant thermal and environmental performance using integrated design concepts for environmental controls. This work in 1988 received the National Academy of Environmental Engineers *Excellence in Environmental Engineering* award.

- evaluating SCR feasibility for power stations, including managing engineering studies, and supervising the design and testing of five pilot plants.

- managing engineering studies of advanced technologies for combined control technologies for nitrogen oxides, sulfur dioxide, and particulate emissions.

RESEARCH ENGINEER
ENERGY & ENVIRONMENTAL RESEARCH CORPORATION
(1975-1978)

Developed combustion systems to control NOx emissions for coal, fuel oil, and natural gas-fired boilers, under sponsorship of the U.S. Environmental Protection Agency, oil refiners, and industrial fuel consumers.

FURTHER BACKGROUND INFORMATION

Mr. Cichanowicz has been awarded (and has pending) numerous patents in NOx and environmental control technology, and power-efficient data center concepts. He has authored or co-authored over 100 technical papers. He is an active member of the American Society of Mechanical Engineers, and the Air & Waste Management Association.

EDUCATION

Clarkson University: BS in Mechanical Engineering, 1972

University of California at Berkeley: MS in Mechanical Engineering & Thermal Sciences, 1975