

9/15/81

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
PENNSYLVANIA POWER AND LIGHT CO.) Docket Nos. 50-387 O.L.
AND) 50-388 O.L.
ALLEGHENY ELECTRIC COOPERATIVE, INC.)
(Susquehanna Steam Electric Station,)
Units 1 and 2))

TESTIMONY OF RAGHAW PRASAD
RELATING TO NEED FOR POWER
(Contention 4)

1. I am an Economist with the Environmental Impact Studies Division of the Argonne National Laboratory at Argonne, Illinois. My responsibilities consist of financial evaluation, cost-benefit analysis, analyzing the demand and supply of different energy sources, and transport network analysis, as part of the preparation of environmental impact statements.
2. I have read Contention 4. My testimony covers the points raised in Contention 4, that is, the benefit to be derived from operation of the Susquehanna facility and alternatives to operation of the Susquehanna facility.
3. Contention 4 asserts that there is no need for the electricity to be generated by the Susquehanna facility due to Applicants' high reserve margins and to the potential for very low growth in demand for electricity and thus electrical energy requirements. The underlying premise of this contention is that the NRC Staff's

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determination of the benefit to be derived from operation of the Susquehanna facility is limited to a finding that the facility is needed because the electricity it will generate, if licensed, will enhance reliability of supply of electricity to Applicants' customers or because it will satisfy growth of electrical energy requirements. The Staff's determination of benefit is not limited to conclusions regarding reliability or growth in electrical energy requirements as alleged in the contention. The FES-OL concluded that the benefit to be derived from operation of the Susquehanna facility is the assurance of a low cost supply of electrical energy through minimization of production costs. More specifically, substantial economic savings will be gained by substitution of the electricity to be generated by the facility for electricity generated by more expensive generating units available to Applicants. FES-OL, §§ 7.3 and 7.3.2.

4. Contention 4 also alleges that conservation and solar energy should be considered as alternatives to operation of the Susquehanna

facility. The FES-OL concludes that the only reasonable alternative to the proposed action of granting an operating license for the Susquehanna facility available for consideration at the operating license stage is denying the license for operation of the facility and thereby not permitting the constructed nuclear facility to be added to the applicant's generating system. FES-OL, § 7.4. Alternatives such as construction at alternative sites, extensive station modification, or construction of facilities utilizing different energy sources would each require additional construction activity with its accompanying economic and environmental costs, whereas operation of the already constructed plant would not create these costs. Furthermore, even if increased conservation savings and additional solar applications could be achieved without additional construction costs, it would still be unreasonable to deny an operating license for the Susquehanna facility because any resultant reduction in demand would not displace the need for the facility as a substitute for less economical generating units. I will demonstrate this last point on pages four through seven of my testimony.

5. Given this factual background, it is not readily conceivable that an alleged reduction in the need for power to supply growth in electrical energy requirements or new developments concerning alternative energy sources, in and of themselves, could result in the denial of an operating license because such a result would be unreasonable. This result would be reasonable only if there had been some significant change in (or newly discovered) information concerning the public health and safety or environmental impacts associated with operation of the FES. No such concerns have been revealed with regard to operation of the Susquehanna facility.
FES-OL, § 7.4.
6. As stated in the FES-OL, the benefit to be derived from operation of the Susquehanna facility is substitution of the electricity to be generated by it for electricity generated by less economical generating units available to Applicants. I can demonstrate that operation of the Susquehanna facility will result in a net benefit even under the conditions alleged by Intervenors in Contention 4. I have therefore assumed that Applicants' system has excess capacity, low energy growth, increased conservation savings, and additional solar applications as alleged in Contention 4.
7. An examination of the capacity currently (1981) available to PP&L and the PJM interchange shows that only about 2 percent and 23

percent of their respective capacities can generate electricity at an equivalent or lower cost to the Susquehanna facility.^{1/} This capacity represents hydro and other nuclear units on these systems. The remaining 98 percent of PP&L's capacity burns either coal (64 percent) or oil (34 percent), while the remaining 77 percent of PJM's capacity is dependent on either coal, oil, or combustion turbines (oil and gas) in the following proportions: 34 percent, 26 percent, and 17 percent.^{2/} This strong dependence on fossil fuels shows that if Susquehanna were not operating, replacement energy would have to be forthcoming from more expensive fossil fuels.

8. The exact source of replacement energy is not something one can readily predict. Logically, the utility will rely upon the least expensive alternative available. For the purpose of this assessment, I have assumed that all replacement energy will be made-up by capacity already on the PJM system. Further, to accommodate the contentions' allegations of low demand and excess capacity, I have assumed that PJM will have underutilized coal

^{1/} U.S. Nuclear Regulatory Commission, Final Environmental Statement related to the Operation of Susquehanna Steam Electric Station, Units 1 and 2, NUREG-0564, Tables 7.4 and 7.5, June 1981.

^{2/} Ibid.

occur over a period of approximately 30 years, corresponding to the estimated useful life of the Susquehanna facility. These savings would be expected to increase in subsequent years because even if equivalent escalation were assumed for coal and nuclear fuel, the escalation is being applied to a larger base value in the case of coal relative to nuclear.

10. A similar analysis was recently prepared by the U.S. Department of Energy's Division of Power Supply and Reliability.^{7/} Its estimated replacement fuel cost for Susquehanna Unit 1 in 1982 is \$13.5 million per month (\$162 million on an annual basis) and reflects equal portions of replacement energy coming from oil and coal. The DOE results are based on an independent analysis prepared by that office. My analysis assumes unusually low energy demand on the PJM interchange such that the marginal cost energy source is shifted from an oil/coal mix to a total reliance on coal. In either case, significant benefits are to be derived by having the units available for operation.

^{7/} Estimates of the Costs of Delaying Operating Licenses for Nuclear Plants, Division of Power Supply and Reliability, U.S. Department of Energy, May 15, 1981.....Included in NRC's Monthly Report to Congress.

PROFESSIONAL QUALIFICATIONS

Raghaw Prasad

Argonne National Laboratory

I am an Economist with the Environmental Impact Studies Division of the Argonne National Laboratory at Argonne, Illinois. My responsibilities consist of financial evaluation, cost-benefit analysis, analyzing the demand and supply of different energy resources, and transport network analysis, as part of the preparation of environmental impact statements. I joined the Division in May, 1979, and since have participated in the preparation of about half a dozen statements.

I have a Bachelor of Science degree (1961) in Electrical Engineering from Ranchi University, India, a Master of Business Administration degree (1973), a Master of Arts (1977) in Economics, and a Ph.D. Candidacy in Economics from Temple University, Philadelphia. My dissertation topic is "Evaluation of Time-of-day and Lifeline Rate Structures and Estimation of Electricity Demand". I have completed all requirements of a Ph.D. degree.

From 1961 to 1970, I worked as an operations research analyst. My responsibilities involved production scheduling, inventory control, cash management, and capital budgeting.

From 1971 to 1973, I was a consultant at a community mental health center, Albert Einstein Hospital, Philadelphia. I directed a program which utilized Eastern philosophy, yoga, and meditation to help individual's and family's mental and physical problems.

From 1973 to 1974, I was a senior systems analyst with Combustion Engineering Refractory Division at Valley Forge, Pennsylvania. I developed and managed a Management Information System, and Business Planning Model.

From 1974 to 1977, I worked as a senior systems planner with Sperry Univac, Blue Bell, Pennsylvania. As a part of my responsibilities I designed and developed a financial and accounting inventory control system to handle the flow of computer parts to and from their subsidiaries located throughout the world.

From 1977 to 1978, I was employed as a senior economist with General Public Utilities, New Jersey. My responsibilities included development of residential and industrial electricity demand models, regional economic impact analyses and electricity demand forecast.

Since joining Argonne, I have performed a number of cost-benefit analyses, financial evaluations, and energy supply and demand analyses to be incorporated into the environmental impact statements. I developed a production and financial model for estimating the natural gas production and financial viability of U.S. Lake Erie Gas Development Program. The results of the model were utilized in the preparation of draft environmental impact statement of U.S. Lake Erie Natural Gas Development Program. I was asked to defend the production and financial data before a public hearing at Buffalo, New York.

I also developed a levelized cost model for comparing per unit cost of generation of electricity using different primary energy fuels. The results were utilized for the Pebble Springs project. I also developed a model to

evaluate the need for the Pond Hill Reservoir to supply the consumptive needs of Susquehanna Steam Electric Station during periods of low river flow.

As a part of my responsibility in the preparation of the Northeast Regional EIS, I provided the coal supply/demand scenario to evaluate the impact of incremental coal demand resulting from conversion of power plants from oil to coal. Presently, I am involved in developing a Northeast Regional Transportation Model.

I am a member of the American Economic Association.