

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

ARIZONA PUBLIC SERVICE COMPANY, et al.
(Palo Verde Nuclear Generating Station,
Units 1, 2, and 3)

Docket Nos. STN 50-528
STN 50-529
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AFFIDAVIT OF RAGHAW PRASAD

RELATING TO THE MONETARY COSTS OF DECOMMISSIONING

(Contention 7)

1. I am an Economist with the Environmental Impact Studies Division of the Argonne National Laboratory at Argonne, Illinois. My responsibilities consist of the financial evaluation, cost-benefit analysis, analyzing the demand and supply of different energy sources, as part of the preparation of environmental impact statements. A copy of my Statement of Professional Qualifications is attached.
2. I have read Contention 7 and the Affidavit of Albert A. Weinstein. My affidavit covers the points raised in the affidavit of Mr. Weinstein's affidavit and Contention 7, that is, the costs for decommissioning the Palo Verde Nuclear Generating Station (PVNGS) Units.
3. Contention 7 asserts that the costs for decommissioning PVNGS units are inadequately calculated. The underlying premise of this contention is that higher decommissioning costs have been estimated in various studies on the topic.

4. I have reviewed the affidavit of Albert A. Weinstein of S. M. Stoller Corporation regarding Contention No. 7. His conclusions concerning the different decommissioning studies appear to be reasonable. His conclusion that the S. M. Stoller Corporation estimate is the most accurate of the projections with respect to the decommissioning for the PVNGS unit in my opinion is also correct. The S. M. Stoller study is based upon the Pacific Northwest Laboratory study.

5. Pacific Northwest Laboratory (PNL), in their comprehensive study of the methods and costs of decommissioning a reference PWR ("Technology, Safety and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station", June, 1978, NUREG/CR-0130) have estimated the costs of decommissioning a PWR similar in size to the PVNGS units. PNL's approach was to develop detailed work plans based on the specific design of the reference plant and expected levels of activity and contamination based on typical PWR operating experience. Based on the estimated requirements for equipment, energy, supplies, and speciality contract labor for these tasks, a total cost for decommissioning by immediate dismantlement was estimated. PNL also estimated costs for alternate modes of decommissioning.

PNL's estimate of immediate dismantlement cost for a 1175 MWe PWR power station at a midwestern site including a contingency allowance of 25% is just over \$42 million in terms of 1978 dollars. This cost includes such costs as those for shipment and disposal of radioactive materials, staff labor, materials, equipment and demolition services. Demolition of the decontaminated structure is estimated to be about \$8 million. Since demolition of the decontaminated structure is not

required by NRC regulations, the total decommissioning cost could be reduced by 19% by not demolishing the structures.

PNL's method of cost estimation technique for decommissioning follows the usual engineering cost estimation procedure. In the absence of actual decommissioning experience of a large size pressurized water reactor power station, this technique is valid and acceptable. PNL's estimate of decommissioning costs of this size reactor is reasonable.

- 6. The S. M. Stoller study which was prepared by S. M. Stoller Corporation (SMSC) for Arizona Nuclear Power Project (ANPP) ["Update of Estimated Costs for Decommissioning one of the Palo Verde Nuclear Generating Station (PVNGS) Units", October 3, 1979], draws heavily from the PNL work but makes reasonable adjustments for design differences between PVNGS and the Trojan Nuclear Station (PNL's reference reactor unit). The earlier analyses of decommissioning costs made by SMSC for ANPP were developed from basic cost data derived from decommissioning of the Elk River reactor and from the Bonus reactor. If the PNL cost estimates appear to be more valid than the Elk River reactor - derived experience, the former estimates were used. The present SMSC's estimates for immediate dismantlement of a PVNGS unit are \$56.7 million, in 1979 dollars, a value which included \$13.3 million contingency allowance (about 24% of the total cost). In my opinion \$56.7 million is a reasonable estimate of total decommissioning cost for PVNGS.

Raghaw Prasad
Raghaw Prasad

Subscribed and sworn to before me this 18th day of February 19 82

Barbara [Signature]
Notary Public

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 and have given testimony at hearings.

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. degree (1981) in Economics from Temple University, Philadelphia. My dissertation topic is "Evaluation of Time-of-day and Lifeline Rate Structures and Estimation of Electricity Demand".

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.

I am a member of the American Economic Association.