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)	)	

AFFIDAVIT OF SIDNEY E. FELD

I, SIDNEY E. FELD, being duly sworn, depose and state:

1. I am currently a Regional-Environmental Economist with the Utility Finance Branch, Division of Engineering of the Nuclear Regulatory Commission (NRC). In my position, I am responsible for reviewing environmental reports and for preparing economic analyses for environmental impact statements. This activity includes need for power analyses.

2. I have read Contention 4. My affidavit covers the points raised in Contention 4, that is the benefit to be derived from operation of the Suquehanna 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

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. Past experience amply supports the conclusion that nuclear power plants are needed. Licensees authorized to operate such plants do in fact operate them to the maximum extent of their availability to produce electricity. Licensees do not abandon them in favor of some other means of generating electricity.

5. 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 affidavit.

6. 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.

7. 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.

8. 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.

9. 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 contention's 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.

capacity to replace what could have been generated by Susquehanna. This means that demand is assumed to be so low that generation from about 43 percent of PJM's capacity, that with the highest production costs, would not be required at all even if Susquehanna is not available to the system.

10. I have also assumed that the Susquehanna units would have operated at an average annual capacity factor of 60 percent.[3/] The 1982 nuclear fuel cost is estimated at 10 mills/kWh and is assumed to escalate at 5 percent per year.[4/] The coal fuel cost is based on the weighted average of the actual value (cents per million BTU) paid by the PJM utilities for coal as of February 1981 and 8 percent per year escalation.[5/] The coal cost is converted to mill/kWh based on an average plant heat rate of 10,000 BTU per kWh. Based on these assumptions, the fuel cost differential associated with the first full year of operation of unit 1 is estimated at $30 million. In the 1983 timeframe, the first year both units are expected to be in operation, the savings are approximately $64 million.[6/] Additional savings would be expected to

---

3/ See for example, R.G. Fasterling, Sandia National Lavoratory, "Statistical Analysis of Power Plant Capacity Factors Through 1979," NUREG/CR-1881, April 1981.

4/ J.O. Roberts, S.M. Davis, and D.A. Nash, "Coal and Nuclear: A comparison of Generating Baseload Electricity by Region", NUREG-0480, December 1978.

5/ U.S. Department of Energy, Energy Information Administration, "Coast and Quality of fuels for Electric Utility Plant - February 1981," FPC Form No. 423, Table 29.

6/ The production cost analysis employed here differs from the one presented in the Susquehanna FES-OL in that fuel costs have been updated and here it is assumed that Susquehanna's output can be totally replaced by coal fired generators in order to satisfy the intervenor's scenario of lower energy growth and excess capacity.

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.

11. 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.

Sidney E. Feld

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.

Subscribed and sworn to before me
this 1st day of September, 1981.

Sandra M Eyler
Notary Public

My Commission expires: July 1, 1982

PROFESSIONAL QUALIFICATIONS

SIDNEY E. FELD

U. S. NUCLEAR REGULATORY COMMISSION

I am Sidney Feld, Regional-Environmental Economist with the Utility Finance Branch, Division of Engineering of the Regulatory Staff of the Commission. I served with the Staff from July, 1973 to August, 1974, and rejoined the Staff in October, 1975. I am responsible for reviewing and analyzing Applicants' environmental reports and preparing economic input for the Regulatory Staff's Environmental Statements. Over the last several years I have devoted most of my attention to Need for Power Analyses, and I was the principal author of the Staff's Standard Review Plan on Need for Facility. I have prepared testimony on need for power and conservation of energy issues for the hearings on Alvin W. Vogtle Nuclear Power Plant, the Shearon Harris Nuclear Power Plant, the Wolf Creek Generating Station, Midland Plant, the Pilgrim Nuclear Generating Station Unit 2, the Zimmer Nuclear Power Station, and the LaCrosse Boiling Water Reactor.

I received a B.B.A. Degree in Economics from the City College of New York in 1967, an M.A. Degree in Economics from the University of Rhode Island in 1969, and a Ph.D. Degree in Resource Economics from the same university in 1973. My graduate degree in resource economics focused on the application of economic theory to public resources. Areas of Study included: simulation of market economic solutions; consideration of social implications such as environmental impacts; and the application of decision tools such as cost-benefit analysis.

From September, 1974 through August, 1975, I was an Assistant Professor of Resource Economics at the University of New Hampshire at Durham, New Hampshire. In this capacity, I taught courses in Resource Economics and Statistics. I also served as co-investigator on a Sea Grant research project to examine economic activity in the New Hampshire Coastal Zone.

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
ALLEGHENY ELECTRIC COOPERATIVE, INC.	)	50-388
	)	
(Susquehanna Steam Electric Station, Units 1 and 2)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF MOTION FOR SUMMARY DISPOSITION OF CONTENTION 4," "STATEMENT OF MATERIAL FACTS AS TO WHICH THERE IS NO GENUINE ISSUE TO BE HEARD" and "AFFIDAVIT OF SIDNEY E. FELD" in the above-captioned proceeding have been served on the following by deposit in the United States mail, first class or, as indicated by an asterisk, by deposit in the Nuclear Regulatory Commission's internal mail system, this 2nd day of September, 1981:

James P. Gleason, Chairman
Administrative Judge
513 Gilmoure Drive
Silver Spring, Maryland 20901

*Mr. Glenn O. Bright
Administrative Judge
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dr. Paul W. Purdom
Administrative Judge
245 Gulph Hills Road
Radnor, Pennsylvania 19087

Jay Silberg, Esq.
Shaw, Pittman, Potts and Trowbridge
1800 M Street, N.W.
Washington, D.C. 20036

Bryan A. Snapp, Esq.
Pennsylvania Power & Light Company
Two North Ninth Street
Allentown, Pennsylvania 18101

Dr. Judith H. Johnsrud
Co-Director
Environmental Coalition on
Nuclear Power
433 Orlando Avenue
State College, Pennsylvania 16801

Mr. Thomas M. Gerusky, Director
Bureau of Radiation Protection
Department of Environmental Resources
Commonwealth of Pennsylvania
P. O. Box 2063
Harrisburg, Pennsylvania 17120

Ms. Colleen Marsh
Box 538A, RD#4
Mountain Top, Pennsylvania 17120

Mr. Thomas J. Halligan
Correspondent: CAND
P. O. Box 5
Scranton, Pennsylvania 18501

*Richard S. Salzman, Esq., Chairman,
Administrative Judge
Atomic Safety and Licensing Appeal Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

*Dr. John H. Buck, Administrative Judge
Atomic Safety and Licensing Appeal Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

*Mr. Thomas S. Moore, Administrative Judge
Atomic Safety and Licensing Appeal Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

*Atomic Safety & Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

*Atomic Safety & Licensing Appeal Board
Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

*Secretary
U.S. Nuclear Regulatory Commission
ATTN: Chief, Docketing & Service Branch
Washington, D.C. 20555

Susquehanna Environmental
Advocates
c/o Gerald Schultz, Esq.
P.O. Box 1560
Wilkes-Barre, PA 18703

Mr. Robert M. Gallo
Resident Inspector
P.O. Box 52
Shickshinny, Pennsylvania 18655

Robert W. Adler
Dept. of Environmental Resources
505 Executive House
P.O. Box 2357
Harrisburg, Pennsylvania 17120

Mr. DeWitt C. Smith, Director
Pennsylvania Emergency Management Agency
Transportation and Safety Building
Harrisburg, Pennsylvania 17120

Jessica H. Laverty
Jessica H. Laverty
Counsel for NRC Staff