UNITED STATES
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
CONSOLIDATED EDISON COMPANY OF NEW YORK	)	Docket Nos. 50-247 SP
(Indian Point Unit 2)	)	50-286 SP
	)	
POWER AUTHORITY OF THE STATE OF NEW YORK	)	
(Indian Point Unit 3)	)	

TESTIMONY OF

NEW YORK STATE

WITNESS JAMES M. PARMELEE

ON COMMISSION QUESTION SIX

April 11, 1983

Q. Will you please state your name, title and affiliation?

A. My name is James M. Parmelee. I am employed as an Electric Energy Planner by the New York State Energy Office (SEO), Agency Building #2, Empire State Plaza, Albany, New York 12223.

Q. Would you please describe your education and experience?

A. I received a Bachelor of Science in Nuclear Engineering from Rensselaer Polytechnic Institute in 1977, and a Masters of Engineering in Nuclear Engineering from Rensselaer Polytechnic Institute in 1978. I also completed the Advanced Electric Utility System Planning Training Program at General Electric in 1979, and completed the Advanced Techniques in Power System Generation Planning course at the Continuing Education Center at the University of Berkeley in California. I have completed the course work for a Doctorate in Electric Power Engineering at Rensselaer Polytechnic Institute.

I have testified on electric generation planning matters in proceedings before the New York State Energy Planning Board on the Draft 1979 and 1981 State Energy Master Plan and Long-Range Electric and Gas Reports (SEMP), issued pursuant to Sections 5-110 and 5-112 of the Energy Law of New York and in a proceeding before the Federal Energy Regulatory Commission on the siting of the proposed Prattsville pumped storage project.

I am a member of the IEEE and the IEEE Working Group on Long-Range System Planning. I have presented or published the following papers:

Impacts of Electric Heat on Time Dependent Demand, 1978 Winter Meeting IEEE-PES, New York. Published in IEEE Energy Development IV.

Impacts of Electric Heat on Generation and Primary Fuel Requirements, 1978 Summer Meeting IEEE-PES, Los Angeles. Published in IEEE Transactions on Power Apparatus and Systems, July-August, 1979.

Impacts of Solar Heating Options Upon Electric Power Systems, 1979 Summer Meeting IEEE-PES , Vancouver, B.C.

Potential Impacts of Wind Electric Generators Upon Electric Power Systems, 1980 Winter Meeting IEEE, New York.

I joined the State Energy Office in February of 1979 and have worked as an Electric System Planner since that time. My present responsibilities include supervising and conducting electric system studies for the State Energy Office. Prior to joining the SEO, I was employed as a Research Assistant for the Center for Technology Assessment of Rensselaer Polytechnic Institute. In that capacity, I conducted studies for the New York State Energy Research and Development Authority which involved analyses of the electric power system in New York State.

Q. What is the purpose of your testimony?

A. I will briefly describe the status and purpose of the State Energy Master Plan (SEMP) in New York State energy matters and its principle elements, summarize the electricity generation plan contained in SEMP, and provide estimates of the operating cost and oil consumption penalties that would result if the electricity generation plan were modified by shutting down Indian Point Units 2 and 3 in 1984.

Q. What is the status and purpose of SEMP in New York State energy matters?

A. It is the policy of the State to conduct energy planning in an integrated and comprehensive manner through development of a long-range State Energy Master Plan. On March 25, 1982, following legislative and adjudicatory hearings as mandated by the State Energy Law, the Energy Planning Board issued an Opinion & Order approving the 1981 Draft SEMP as modified therein (SEMP II). A copy of the 1982 update of the New York State Energy Master Plan and Long-Range Electric and Gas Report which contains the Opinion & Order is attached as Exhibit No.___(JMP1). The findings of the SEMP serve a variety of purposes, principally:

- o Public and Private Sector Planning. SEMP provides "the framework for energy-related decisions made throughout the State" (Energy Law, Section 5-110). In addition, the Plan controls "all energy-related decisions made by the State and will be the guide for energy-related decisions in the private sector." (Governor's Memorandum of Approval, McKinney's 1978 Session Laws, p. 1838).
- o Public Service Law Article VIII and Article VII Decisions. The specific findings with respect to projected electric demand in the Report are binding on the State Board on Electric Generation Siting and the Environment (Siting Board) with respect to any determination of need for future steam electric generating facilities under Article VIII of the New York Public Service Law (Energy Law, Section 5-112 (3)(c)). In addition, the Siting Board must find that a proposed facility is consistent with the

"long-range planning objectives for electric power supply in the state" established by the Plan before it may grant an application for a certificate under Article VIII (Public Service Law, Section 146(2)(e)). Moreover, the specific findings with respect to projected electric and gas demand are binding on the Public Service Commission with respect to any determination of need for major electric and gas transmission facilities under Article VII of the Public Service Law (Energy Law, Section 5-112(3)(c)).

Q. Would you please summarize the principle elements of SEMP II.

A. SEMP II consists of:

- o A list of specific state energy policies.
- o A fifteen year forecast of New York State energy requirements.
- o A summary of the plans for meeting forecasted energy requirements including an electricity supply plan.
- o Recommendations for administrative and legislative actions to implement State energy policy.

Q. Would you please summarize the electricity supply plan for the 1981-1996 period approved by the State Energy Planning Board (EPB) in its March 1982 Opinion & Order?

A. The electricity generation plan (1981-1996) approved by the EPB is shown in Exhibit No.___(JMP2). Major features of the generation plan include:

- o Completion of 2,518 Mw of generating capacity now under construction in the State and another 2,350 Mw of generating capacity that has been licensed for construction in the State.

- o Construction of a 1,000 Mw pumped storage facility targeted to start operation in 1987.
- o Conversion of almost 3,600 Mw of oil capacity to coal.
- o Development of small hydro, cogeneration, solid waste and wind capacity totalling 1,552 Mw by 1996.
- o Importation of Canadian power.

This plan also assumed the continued operation of all plants, including Indian Point 2 & 3, over their expected useful lives. In the case of Indian Point 2 & 3, the useful life is expected to extend beyond the 15 year planning period.

Q. Has the potential for conservation been considered in the development of the electricity supply plan?

A. Yes. The potential impact of reasonably foreseeable conservation actions, both mandated and price induced, was considered by the Energy Planning Board in connection with its development of the electricity energy and demand forecasts. These forecasts were then used by the Board in the development of the electricity supply plan approved by the Board.

Q. Have you analyzed the fuel and economic impacts of shutting down Indian Point Units 2 and 3?

A. Yes, I have analyzed these impacts using the General Electric Optimized Generation Planning (OGP-5) electric system simulation model.

Four major scenarios were analyzed. They are:

1. A base case using the electricity generation supply plan identified in Exhibit___(JMP2).
2. A case similar to the base case but with Indian Point Unit 2 assumed not to be in operation in 1984 and thereafter.
3. A case similar to the base case with Indian Point Unit 3 assumed not to be in operation in 1984 and thereafter.
4. A case similar to the base case but with Indian Point Unit 2 and 3 both assumed not to be in operation in 1984 and thereafter.

Q. What are the major assumptions you used in your analysis?

A. The principle source of the assumptions used in my analysis is the State Energy Master Plan (SEMP II). I used the electricity generation expansion plan shown in Exhibit No.___ (JMP2) which is the plan approved by the EPB in its Opinion and Order of March 25, 1982. However, the most recent estimates of the New York Power Pool with respect to Canadian electricity imports as shown in Exhibit No.___ (JMP3) were used in the analysis. Minor slippage in the assumed installation dates of some coal conversions were also assumed in the analysis. Additionally, fuel, O&M and discount rates were adjusted to account for more recent trends. The study period is 1982 to 1996. The projected energy growth rate of approximately 1.7% per annum and a peak load growth rate of approximately 1.5% per annum were assumed. A capacity factor of 57.7 percent was assumed for the Indian Point Units for the study period.

Q. What are the estimated cost impacts that would result from shutting down the Indian Point Units?

A. Exhibit No.___(JMP4) shows the production costs and oil use that would result under each of the four scenarios described earlier. There would be an 10.1 percent increase in cumulative present worth production costs from 1984 to 1996 which represents an additional $2.3 billion in 1982 present worth costs, if the Indian Point Units 2 and 3 are shut down in 1984. The cumulative present worth production costs would increase through 1996 by $1.1 billion and $1.2 billion if either Unit 2 and 3, respectively, is shut down.

Q. What are the estimated oil consumption increases that would result from shutting down the Indian Point Units?

A. An additional 154.2 million barrels of oil would be consumed over the period 1984-1996 if both Units 2 and 3 are shut down. The increase would be 72.8 or 81.1 million barrels if either Unit 2 or Unit 3, respectively, is shut down.

Q. What impact would the shutdown of Indian Point Units 2 and 3 have on the price of electricity in Consolidated Edison's territory?

A. I estimate that electricity production costs for Consolidated Edison in nominal year dollars would increase by an average of:

- o 1.19¢/Kwh in 1986.
- o 1.48¢/Kwh in 1991.
- o 2.35¢/Kwh in 1996.

Q. Did you evaluate what the economic and fuel consumption impacts would be if the Indian Point Units were to operate at capacity factors other 57.5 percent?

A. Yes. A case was run with the capacity factors of Indian Point Units 2 and 3 set at 47.1 percent and another case was run with the capacity factors set at 68.3 percent.

Q. What are the results of your analysis based on the 47.1% and 68.3% capacity factors?

A. The production cost increase and the oil consumption increase that would result from shutting down Units 2 and 3 are shown in Exhibit No.___ (JMP5).

Q. In summary, what conclusions can be reached from your analysis?

A. There are likely to be significant economic and oil penalties associated with the shutdown of one or both of the Indian Point facilities, under various assumed capacity factors ranging from 47.1% to 68.3%.

Q. What would be the impact on your analysis of delaying or cancelling one or more of the planned oil to coal conversions or new coal plants included in Exhibit No.___ JMP-2?

A. Cancellation or delays of one or more of these oil to coal conversions or new coal plants will result in increased cost penalties and increased oil use penalties associated with shutting down the Indian Point facilities.

Q. Does this complete your testimony?

A. Yes.

Exhibit No. ___ (JMP2)

Electricity Supply Plan
(1981-1996)

New Facilities	Capacity (MW)	Fuel	Date
Under Construction			
Shoreham	813	Nuclear	1983
Somerset	625	Coal	1984
Nine Mile Point 2	1080	Nuclear	1986
Licensed			
Arthur Kill	700	Coal/RDF	1987
Jamesport	800	Coal	1989
Lake Erie	850	Coal	1991
Planned			
Pumped Storage Hydro	1000	PS Hydro	1987
Oil to Coal Conversion (PHASE I)	(MW After Conversion)		
Ravenswood 3	923		1983
Lovett 4 & 5	387		1982-83
Arthur Kill 3	491		1983
Arthur Kill 2	333		1984
Albany 1-4	396		1984
Danskammer 3	137		1986
Danskammer 4	231		1986
E.F. Barrett 1 & 2	348		1987
Port Jefferson 3 & 4	348		1987

Alternative Electric Generation (Cummulative MW Additions Since 1979)	1981	1986	1991	1996
Small Hydro	11.1	266.5	490.8	725.0
Cogeneration	26.7	230.5	322.5	373.5
Solid Waste	32.0	169.5	353.5	395.5
Wind	0.2	4.5	13.5	58.5

Canadian Imports	1981-1983	1984-1987	1988-1996
Energy (Billion of KWH per year)	10.5	12.5	14.5

Exhibit JMP-3

Canadian Electricity Imports Assumptions (BKwh/Year)

Year	Energy Planning Board	Updated Assumptions
1981	10.5	N/A
1982-1983	10.5	N/A
1984-1987	12.5	18.0
1988-1996	14.5	18.0

Exhibit No.___ (JMP4)

Cummulative Production Costs 1984-1996
(Millions of PWARR 1982 $)

	Base Case	w/o IP2	w/o IP3	w/o IP 2&3
Fuel Costs	20,043	21,328	21,423	22,760
O&M Costs	3,487	3,330	3,312	3,155
Production Cost Total	23,530	24,658	24,734	25,915
Increased Cost		4.8%	5.1%	10.1%

Oil Use in Millions of Barrels
(Cumulative 1984-1996)

	Base Case	w/o IP2	w/o IP3	w/o IP 2&3
Oil Use	295.1	367.9	328.3	272.9
% Increase		24.7	27.5	52.3

Exhibit No.___ (JMP5)

Sensitivity of Production Cost and Oil
Consumption Increases to Capacity Factor
of Indian Point Units 2 and 3

	Base Case CF = 57.7%	Base Case CF = 47.1%	Base Case CF = 68.3%
Production Cost Increase Due to Shut Down of Units 2 and 3			
Million PWARR 1982 $	2,385	1,912	2,869
% Increase	10.1%	7.9%	12.4%
Oil Consumption Increase			
Million Barrels	154.2	121.0	176.3
Percent Increase	52.3%	36.9%	64.6%