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BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

Pennsylvania Public Utility Commission	:	
	:	Docket No. R-00943271
v.	:	R-00943271COO1
	:	
Pennsylvania Power and Light Company	:	et seq.

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BRIEF

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Dated: 14 June 1995

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JUN 16 1995

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BRIEF: ERIC JOSEPH EPSTEIN, PRO SE

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I. INTRODUCTION

Throughout the evidentiary hearings of the Pennsylvania Power and Light (PP&L) rate request proceedings, Eric Joseph Epstein has focused on two issues pertaining to the Susquehanna Electric Steam Station: the cost and feasibility of nuclear decommissioning and radioactive waste management. Epstein does not dispute PP&L's [hereinafter Company] position that radiological decommissioning costs and radioactive waste isolation expenses will increase. However, the management of PP&L aggressively pursued the licensing, construction and operation of the Susquehanna Steam Electric Station fully cognizant that no commercial nuclear reactor had been decommissioned and that no solution to the permanent storage and isolation of low-level and high-level radioactive waste problem had been found. The Company has thus willfully pursued a financial investment in nuclear energy which was knowingly fraught with huge uncertainties. Therefore, it is grossly unfair and inequitable to request the rate payers to provide a financial safety net for PP&L's risky nuclear investment strategy. Epstein argues that ratepayer equity and

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corporate accountability necessitates that a substantial portion of the rate increase relating to decommissioning and nuclear waste disposal costs should be borne by the entities that are traditionally held responsible for imprudent and unreasonable management decisions -- the PP&L shareholder.

II. STATEMENT OF THE ISSUES

A. Cost Estimates for Radiological Decommissioning

The wild fluctuation in the cost estimates for radiological decommissioning are based, in large part, upon the lack of any prior decommissioning activity in nuclear plants. The largest commercial nuclear power plant to be decommissioned, Shippingport , was a 72 megawatt (MWe) light-water breeder reactor which was substantially smaller than the Susquehanna Electric Steam Station. Company witness LaGuardia admitted that Shippingport was "almost like a pilot plant." (Transcript, page 2103, Lines 17-20) Shippingport was owned and operated by Duquesne Light Company under special agreement with the Department of Energy. The entire core was also removed and replaced three times prior to decommissioning, and as noted by Company witness LaGuardia during cross examination, "[T]here were several cores at Shippingport starting out as a pressurized water reactor and later being converted to a light water reactor." (Page 2105, Lines 19-21). Furthermore, the reactor vessel was shipped to the Hanford Reservation (through an exclusive and unique agreement with the Department of Energy) thus depriving the industry of critical hands-on decommissioning experience. In fact, Shippingport was dismantled

and not decommissioned. The immense differences between Shippingport and Susquehanna, therefore, make any financial comparison between the two inadequate and baseless.

Several other nuclear reactors are being prepared for decommissioning but provide little meaningful decommissioning experience that could be used reliably to predict the decommissioning costs of SESS.

For instance, Yankee Rowe was cited by Company witness LaGuardia as another reliable base predictor of the decommissioning cost estimates associated with Susquehanna.Yankee Rowe, however, is a small commercial plant (167 MWe) that had two unique advantages which make it an unlikely predictor of decommissioning costs at other nuclear plants: 1) Barnwell , the regional low-level radioactive waste disposal site, was open to states outside of the Southeastern Compact; and, 2) The most significant component removal, steam generators, was completed without Nuclear Regulatory Commission (NRC) approval. The Company's witness, Thomas LaGuardia, admitted, "[t]hat's correct, at the time. They [Maine Yankee Atomic Power Company] didn't have the decommissioning plan approved at that time." (Page 2095, Lines 17-18.) Moreover, this plant is only in the initial phase of decommissioning and costs have already mushroomed from $247 to $370 million in the last two years primarily for spent fuel management costs. (PP&L witness, Thomas LaGuardia, confirmed the figures on page 1029, Lines 16-22.)

Shoreham, a large Boiling Water Reactor (809 MWe), was decommissioned after two full power days of operation or 1/7,300 of SESS's "expected" operating life, thus making it, too, an unpredictable and unstable indicator of future decommissioning costs.

As of the filing of this brief, no commercial nuclear power plant has been decommissioned, decontaminated and returned to Greenfield (the original environmental status prior to construction and operation of the nuclear power plant). Nuclear decontamination and decommissioning technologies are in their infancy and several identifiable industrial trends are apparent when reviewing the Nuclear Regulatory Commission's treatment of prematurely shutdown reactors: 1) There is a reluctance to undertake, initiate or finance decommissioning research; 2) Prematurely shutdown reactors place an additional financial strain on the licensee; and, 3) These reactors have been retired for mechanical or economic reasons. [United States Nuclear Regulatory Commission, Advisory Panel for the Decontamination of Three Mile Island Unit-2, September 23, 1993.]

PP&L contracted with the nuclear industry's decommissioning consultant, TLG, to construct decommissioning cost estimates based on work completed at Shippingport, Shoreham, Yankee Rowe and small, prototype reactors such as: BONUS (17 MWe) placed in ENTOMBMENT; Elk River (20 MWe) a reactor approximately 2% of Susquehanna's size which operated for five years; and, Pathfinder (60 MWe), which operated for 283 full power days (LaGuardia, Page 1044, Line 1) before being placed in SAFESTOR in 1989.) These estimates, made by LaGuardia, relied on: 1) The development of nonexistent technologies; 2) Anticipated

projected cost of radioactive disposal; and, 3) The assumption that costs for decommissioning small and short lived reactors can be accurately extrapolated to apply to large commercial reactors operating for forty years.

Susquehanna's projected costs for decommissioning have increased by 553% since 1981. In 1981, PP&L engineer Alvin Weinstein predicted that PP&L's share to decommission SESS would fall between $135 and $191 million. By 1985, the cost estimate had climbed to $285 million, and by 1991 the cost in 1988 dollars for the "radioactive portion" of decommissioning was $350 million. The Company then contracted out for a site-specific study which projected that the cost of immediate decommissioning [DECON] would be $725 million in 1993 dollars. The 1994 cost estimate remained steady at $724 million, but the market value of securities held and accrued in income in the trust funds declined, and thus the estimate reflected another increase in decommissioning costs. (Page, 1016, Lines 7-27 and Page 1017, Lines 1-24.)

Additionally , the impact of the review of the Financial Accounting Standards Board (Security Exchange Commission) has yet to be configured into the decommissioning formula. "As a result, current electric utility industry accounting practices for decommissioning may change, including the possibility that the estimated cost for decommissioning could be recorded as a liability on a basis other than an accrual over the estimated life of the plant." (Pennsylvania Power & Light Company, "Annual Report 1994," **Nuclear Decommissioning Cost,** p.34.)

One of the most disturbing and bizarre aspects of the radiological decommissioning aspect of SESS is the "Who's on first? What's on second relationship?" between PP&L and the minority shareholder of the Susquehanna Electric Steam Station, the Allegheny Electric Cooperative (AEC). AEC is scheduled to contribute 10% of the cost of decommissioning. Company consultant, TLG, estimated PP&L's decommissioning share to be $724 million for 90% of the total cost of decommissioning. Based on this calculation, AEC 's 10% share of $804 million should be $79 million. However, Allegheny is setting aside a figure based on 5% of the final decommissioning costs even though Laurence V. Bladen, Director of Finance and Administrative Services told Epstein that AEC is basing its decommissioning costs on data supplied by PP&L. (Telephone conversation, March 30, 1995.) "Allegheny's portion of the estimated cost of decommissioning SESS is approximately $37.8 million (same figure enumerated in the AEC 1993 Annual Report, p.27) and is being accrued over the estimated useful life of the plant." (Decommissioning Trust Fund. (Allegheny Electric Cooperative, 1994 Annual Report, **Cost of Decommissioning Nuclear Plant**, p.49.) The cost projections have not changed since the AEC's 1993 Annual Report. (p.27).

Unfortunately, PP&L has adopted a distant and negligent attitude toward AEC's obligations. Mr. Ronald E. Hill, senior vice-president of Finance for PP&L was questioned by Mr. Epstein on the relationship between AEC and PP&L, and he exhibited this distant and negligent attitude:

Q: Have you read Allegheny Electric Cooperative's annual report from last year by any chance?
Witness: I believe I glanced at it, but I can't recall specifics. (Page 448, Lines 15-22.)

Q: Can you tell me why they're [AEC] only putting aside $37.8 million?
Witness: Not specifically except they're probably using a different estimate than we used. (page 449, Lines 5-8.)

Q: Allegheny could be planning it [decommissioning] on entomb, they could be planning it on decon?
Witness: They could be basing they're estimate on the NRC required funding level, too. There are several different methodologies of coming up with the estimate to decommission plants.
Q: But it's possible that you could be putting aside money -- I believe, actually, your method is decon and their method is safe store.
Witness: I don't know what their method is. I don't believe it's safe store. (Page 450, Lines 11-25 and Page 451, Lines 1-12.)

Unfortunately, AEC does not know what method it is employing to calculate decommissioning costs either. On March 30, 1995, Epstein contacted Mr. Bladen of the Allegheny Electric Cooperative. Mr. Bladen informed Mr. Epstein that decommissioning costs were based on estimates supplied by PP&L. Bladen noted: "It's not like we could decommission [Susquehanna] using a different method." However, Mr. Bladen could not identify the decommissioning mode. Mr. Epstein called on May 12, 1995 and Mr. Bladen informed him that the method for decommissioning Susquehanna was "Greenfield." Mr. Epstein informed Mr. Bladen that Greenfield is not a decommissioning mode and Mr. Bladen responded, "I'll have to do some further checking." Mr. Epstein recontacted Mr. Bladen on June 5, 1995, at which time Mr. Bladen replied, "I keep asking the engineers. I know its not ENTOMBMENT." Mr. Bladen is charged with financial oversight of AEC, and although sincere and responsive, has absolutely no idea about the method and financial expectations associated with the decommissioning of Susquehanna.

PP&L has no enforcement mechanism to compel Allegheny Electric to fund 10% of the decommissioning costs for SESS. Mr. Epstein queried the Company witness, Mr. Ronald Hill about the relationship:

Q: But there is actually no coordination?
A: There is coordination, but they're under no obligation to accept our estimate and to fund in the same manner that we do. They are obligated to come up with their share of the money at the end.
Judge Christianson: Coordination but not control.
Witness: That's right your honor.
Q: Do you know what method right now they're anticipating Susquehanna will be *decommissioned as?*
A: No, I don't.
Q: So it's possible they may be envisioning the decommissioning of Susquehanna say, entomb, whereas right now you're envisioning it as decon?
Witness: They may be. (Page 450, Lines 11-25 and Page 451, Line 1-12.)

In Response to Data Request on May 24, 1995, (Tr. 1950-1951), John M. Chappelear, Vice President-Investments & pensions for PP&L conceded the Company did not coordinate decommissioning funding with AEC and maintained he did not know what impact insolvency or insufficient funding on the part of the Allegheny Electric Cooperative would have on the decommissioning of Susquehanna. (Responses of PP&L Witness, John M. Chappelear to Questions of Eric Epstein, Attachment 1, Page 2.)

The Allegheny Electric Cooperative is owned and controlled by fourteen (14) distribution cooperatives. AEC is not regulated by the Public Utility Commission nor does the company have publicly traded stock. Therefore, there is no behavior modifying mechanism afforded to state regulators or shareholders to oversee AEC's contributions. If current trends continue unabated, AEC's expected decommissioning savings will be grossly inadequate and will therefore undermine PP&L's decommissioning plans for Susquehanna (SESS).

In addition, the Allegheny Electric Cooperative only generates 54% (1994 Allegheny Electric Cooperative, 1994 Annual Report, p.12) of the electricity it distributes and any sudden and large interruption in electric distribution, (e.g. premature shutdown of Susquehanna), would further erode AEC's ability to make decommissioning contributions.

AEC's tenuous financial position in regard to inadequate decommissioning savings will place a greater fiscal burden on PP&L and, thereby; 1) Create further uncertainties about PP&L's ability to meet its financial commitments to decommission SESS; 2) Undermine TLG's net decommissioning estimates; and 3) Dilute TLG's contingency factor.

The cost estimates for non-radiological decommissioning (an imprecise term) are not mandated by the NRC although the agency stipulates that Susquehanna be returned to Greenfields, i.e. the original environmental status of Susquehanna prior to construction of the nuclear power plant. The fact that Greenfields has not been achieved by any large commercial nuclear plant and that PP&L is not required to save for this phase, places additional strain on the Company's ability to finance radiological and non-radiological decommissioning.

B. Planned Operating Life for Susquehanna

Experience at large commercial nuclear power plants over 200 MWe has clearly demonstrated that TLG's assumption, which is shared by the company, that SESS will operate for 40 years is a cruel fantasy that will penalize hostage PP&L rate payers. In fact, the Company's counsel, Mr. David MacGregor conceded, "He [Thomas LaGuardia] knows nothing about the operations of the Susquehanna plant." (Page 455, Lines 22-25 and Page 456 Line 1). The Company's witness, Thomas LaGuardia, was asked by Epstein: "[H]ow many commercial nuclear power plants in this country have completed their full operating lives?" Mr. LaGuardia replied: "[N]one, essentially." (Page 1023, Lines 20-22.) Additionally, George T. Jones, Vice-President of Nuclear Engineering, was asked by Mr. Epstein:

Q: "In your experience, which is rather extensive at TVA, Energy and CE, can you at least let me know what is the longest life of a plant you've been associated with?"
Mr. Jones: "I've never been associated with one that -- none of them have ever reached the end of their licensed life.

There has been a lot of work done and continues to be done on life extension, not by us but by the industry. I don't know." (Page 2272, Lines 8-16.)

Even Mr. MacGregor wavered on Susquehanna's ability to operate for its full-life. Mr. Epstein asked him: "But his [LaGuardia] methodology is based on the fact the plant will operate for 40 years; is that not correct." Mr. MacGregor answered, "I'm not sure that's true." (Page 456, Lines 15-18.)

Mr. LaGuardia's and Mr. Jones's acknowledgments are confirmed by empirical data. The following reactors have been shut down prematurely: Shoreham, 809 MWe, operated for two full-power days (which is .000136986% Susquehanna's estimated life) and closed before it could begin commercial operation in May 1989; Trojan, 1095 MWe which operated for 40% of its operating life (May 1976 to November 1992); Three Mile Island-2, 792 MWe which operated for 1/120 of its operating life (December 1978 to March 1979), Dresden, 200 MWe which operated for 45% of its operating life (July 1960 to October 1978); Indian Point-1, 257 MWe which operated for 30% of its operating life (January 1963 to October 1974); San Onofre-1, 436 MWe which operated for 35% of its expected life (from January 1968 to November 1992); and, Fort Saint Vrain, 330 MWe which operated for 27.5% of its expected life (January 1979 to to August 1989). [World List of Nuclear Power Plants: Operable, Under Construction, or on Order (30 MWe and Over) as of December 31, 1994, "Nuclear News," March, 1995, pp. 38-42.]

The Susquehanna nuclear power plant is not likely to operate for 100% of its projected operating life despite Mr. LaGuardia's wishful thinking. Company witness LaGuardia stated that: "I don't know if I'd call it hope. That's what I think is going to happen." (Page 1024, Lines 6-7.) John M. Chappelear, who coordinates the Company's Nuclear Decommissioning Fund, asserted:

> In the case of nuclear decommissioning liability, there is no certainty as to when the decommissioning process will begin and, when it does begin, it is likely not to extend over anything close to a 60 year period. In making this statement, I did not utilize any specific data other than my experience with pension plans and general information regarding nuclear decommissioning...there is a possibility that any nuclear plant may have to be decommissioned before its license expiration date. (Responses of PP&L Witness, John M. Chappelear, to Questions of Eric Epstein, Attachment 1, Page 1.)

A sense of fiduciary accountability and fair play dictates that the company plan for decommissioning based on the assumption that the SESS will be prematurely shut down.

The chief indicators that PP&L relies on to measure plant longevity are spurious and imprecise. In Mr. Epstein's surrebuttal (See Discussion on pp.2-3) he demonstrated that there is no clear nexus between operating capacity (measure of electricity actually produced compared to what would have been generated if the plant had operated continuously at full power) and plant longevity. The Company did not dispute this argument during surrebuttal cross examination of Mr. George Jones upon May 26, 1995 and that evidence should therefore be admitted as true.

The Company attacked Mr. Epstein's contention that the Systematic Assessment Licensee Performance is used as an evaluation tool by the NRC. Mr. Epstein asked Mr. Jones whether or not "the SALP is also used as a report card for licensee performance..." Mr. Jones replied: "It is not stated so in he NRC directives." (Page 2265, Lines 20-24.)

Mr. Epstein contacted both the Nuclear Regulatory Commission(NRC) and the Pennsylvania Department of Environmental Resources(DER) to clarify the definition and interpretation of the SALP.

On June 7, 1995 at 10:00 am, Mr. Epstein spoke with Dr. Michael Masnik, Senior Project Manager, Non-Power Reactors and Decommissioning Project Directorate, Division of Plant Support, Office of Nuclear Reactor Regulation, Nuclear Regulatory Commission in Bethesda, Maryland. Dr. Masnik explained the purpose of the SALP:

> Technically, by NRC regulations, the purpose of the SALP is to determine how much NRC resources to allocate. [It's] clear the nexus is that if they're doing a lousy job they need more oversight. Bond ratings and stock [value] tend to rise and fall on the SALP.

On June 5, 1995, at 9:30 am, Mr. Epstein spoke with Richard Janati, Pennsylvania Department of Environmental Resources (DER), Bureau of Radiation Protection and head of the Nuclear Safety Division. Mr. Epstein asked, "Is the SALP a grading tool for evaluating licensee performance?" Mr. Janati replied, "Generally that's the case because they [NRC] looks at all functional areas...Yes. Good indication which direction licensee is going."

On June 9, 1995, Mr. Epstein met with Stan Maingi, the Bureau of Radiation Protection's dedicated principal engineer for the Peach Bottom and Limerick nuclear power plants. Mr. Epstein asked Mr. Maingi for his impression of the purpose of the SALP. Mr. Maingi responded, "[The SALP] A view from 20 miles. What you want is where the plant is and where it's going. Essentially monitors trends."

Clearly, the Company chose a limited interpretation of the SALP's applicability to plant performance. This is indeed ironic given PP&L's past reporting to shareholders. For example, on January 1, 1990, Robert K. Campbell, President, reported in the "PP&L Shareowners Newsletter":

> We are pleased that the Susquehanna plant has maintained its high performance rating following a periodic evaluation by the Nuclear Regulatory Commission. In its Systematic Assessment of Licensee Performance, covering the period from February 1988 through July 1989, the NRC gave the plant the highest rating possible in five of seven categories...and the second-highest rating in the remaining two categories. The NRC periodically performs evaluations on every nuclear plant in the country. Our plant has consistently earned very high marks in its SALP reports.

Additionally, "The Wall Street Journal" has described the SALP as a grading tool: "The NRC periodically conducts plant safety inspections. The results are known as SALPs, for Systematic Assessment of Licensee Performance." [Bill Paul, "Electric Utility Analysts Almost Never Discuss Financial Impact of Accidents at Nuclear Power Plants," March 18, 1987.]

As previously noted, operating capacity and historical evidence from commercial nuclear power plants gives no indication that the Susquehanna Steam Electric Station will operate for 40 years. On the contrary, empirical data has resoundingly demonstrated that nuclear power plants have not operated for the term of their license. [See *infra* II-A Discussion.]

Moreover, PP&L recently boosted Susquehanna's generating capacity during the spring 1994 refueling outage by 53,500 kilowatts (a five percent increase.) The increase in power at the SESS is an astute financial move: the unit price for a kilowatt of electric decreases. "Such a long term view is part of our strategy to recover invested funds and earn a return on our investment in Susquehanna." (William F. Hecht, President, Pennsylvania Power and Light Company, "PP&L Shareowners' Newsletter," October 1, 1994.)

Safety at nuclear power plants is based on the concept of safety-in-depth. Unfortunately, the increase in power necessarily decreases the margin of safety at a time when the NRC is scaling back on site supervision at all nuclear power plants.

C. Generic Challenges

Commercial Nuclear power plants in the United States are predominately boiling water reactors (BWR) or pressurized water reactors (PWR) supplied by General Electric, Westinghouse, Combustion Engineering or Babcock & Wilcox. Historically, each vendor has encountered generic challenges at the reactors they construct. Susquehanna is no exception. The most serious potential generic issues that face BWR's are vessel shroud cracks and containment vessel integrity.

Vessel shroud cracks are a serious problem which were first identified at Carolina Power & Light's Brunswick-2 in 1991 (767 MWe; began operation in March 1977) and Brunswick-2 (754 MWe; began operation November 1975) in September 1993. *The cracks at this facility were attributable to stress corrosion and irradiation.* Both are signs of premature aging. Cracks have also been identified at the following General Electric Boiling Water Reactors: Dresden-3 (794 MWe which came on line in November 1971) and Quad Cities-1 (789 MWe which came on line February 1973). In addition, on June 30, 1994, PECO Energy Company reported vessel shroud cracking in Unit-3 (1034 MWe; began operation in December 1974). [World List of Nuclear Power Plants, *see supra*].

PP&L has joined the BWR Vessel and Internals Project owners group who announced "cracking of the core shroud is a warning that additional safety-class reactor internals are increasingly more susceptible to the same age related deterioration." ["Nuclear Monitor," November 21, 1994, pp.1-2.] As the SESS ages, it will become more vulnerable to age-related problems such as vessel shroud cracks,

which have begun to appear at General Electric Boiling Water Reactors. Stan Maingi of the Pennsylvania Department of Environmental Resources told Mr. Epstein on June 9, 1995: "that's an issue that can shut them [BWR's] all down. They formed BWR Vessel and Internals Project."

PP&L settled out of court with General Electric (GE) in March 1992 for $55 million for problems relating to generic flaws in the Mark I containment structure. (Page 1038, Line 23-25 and Page 1039, Lines 1-18.) "Certain designs have prompted the NRC and others to raise questions about potential safety problems. These include General Electric's Mark I containment shell and the Babcock &Wilcox designed reactors." *See* "The Wall Street Journal," Wednesday March 18, 1987, p.63.

The nuclear industry has yet to resolve the generic problem associated with the faulty fire barrier - Thermo-Lag. PP&L deployed over 15,000' (linear) of Thermo-Lag in Susquehanna (Robert G. Byram, Letter to the US NRC, Document Control Desk, December 22, 1994) and conducted tests that demonstrated that the material would not comply with regulations as admitted by Mr. Gorge Jones during surrebuttal cross examination on May 26, 1995 (Page 2276, Lines 1-10.) In addition, Robert G. Byram, senior Vice President-Nuclear for PP&L acknowledged in a letter to the NRC that the performance record of Thermo-Lag "has led us to the conclusion that Thermo-Lag elimination through reanalysis is the only realistic approach to resolving this issue.(Robert G. Byram, *see supra.*)

Kent Walker, Chairman, OIG Thermal Sciences Inc. Task Force, NRC stated:

> During OIG inspection team reviews with Pennsylvania Power & Light Company (PP&L) fire protection engineers on January 29 & 30, 1992, regrading the Thermo-Lag 330-1 installed at Unit-1 at Susquehanna, George Mulley and Harold Fossett learned that PP&L is using a failed test to qualify test to qualify 0 percent of the Thermo-Lag installed on cable trays in Unit-1...In summary, based on the above information provided by the PP&L engineers, it appears possible that Susquehanna Unit-1 has been operating since 1982 with an unqualified Thermo-Lag fire barrier configuration which may not perform adequately. (MEMORANDUM FOR: Frank J. Miraglia, Jr., deputy Director, Office of Nuclear Reactor Regulation, February 3, 1992.)

Unfortunately, the utilities, including PP&L, failed to respond properly to NRC initiatives. As a consequence, the Nuclear Energy Institute has assumed responsibility for interfacing with licensees on this issue.

To date, the above mentioned generic issue remain unresolved.

D. Spent Fuel Disposal

There is no location to permanently store spent fuel generated by nuclear power plants. This is a significant problem for Susquehanna Unit-1 and -2. Their fuel storage capacity will be exhausted in 2001 and 2002 respectfully. Actually, as Mr. George Jones indicated in a Response to a Data Request by Mr. Epstein: "PP&L's existing spent fuel storage capacity is sufficient to accommodate fuel removed through 1997 and still maintain the capability to simultaneously off-load both fuel core." (March 21, 1995 Hearing Tr. 181-182), Docket No. R-00943271.) However, the SESS licensee expires in 2020, which is also the date TLG and PP&L predict that the units will be decommissioned. Susquehanna has become a high-level, radioactive waste (HLW) disposal site and is seeking to increase storage capacity through an untested, commercial technology, i.e. dry cask storage.

Even if spent fuel storage is increased at Susquehanna, the additional cost will have a significant impact on decommissioning. This cost, which was omitted from TLG's estimate ("None of the estimates we have prepared include the cost of disposal of spent nuclear fuel," Page 1032, Lines 20-12), is the main contributing factor in the escalation of decommissioning costs at Yankee Rowe. Thomas LaGuardia, the Company's witness, admitted the increase during cross examination:

Mr. Epstein: "Are you aware that the cost has increased for the decommissioning of Yankee Rowe from $247 million to $370 million over the last two years?"
Witness: "Yes. I'm aware of what the estimate concludes."
Mr. Epstein: "And half of the cost was attributable to spent fuel storage?"
Witness: "That's correct." (Page 1029, Lines 16-22.)

Aggravating the critical shortage of HLW storage space is the bleak estimate for the completion of Yucca Mountain, the designated repository for high level nuclear waste. The earliest date this repository could be available is 2010. Recently, Lynn M. Shishido-Topel, commissioner of the Illinois Commerce Commission testified on behalf of the National Association of Regulatory Commissioners before the House Subcommittee on Energy and Mining Resources and the House Committee on Oversight and Investigations (March 17, 1995.) She told the panel that she was "fairly certain that DOE would not meet its revised 2010 deadline to begin accepting spent fuel from commercial reactors." [Bureau of National Affairs (BNA), "Federal Facilities: Industry, DOE Struggle to Find Acceptable Solution to Interim Storage of Spent Fuel, Daily Environment Report News, March 18, 1994 [1994 DEN 52 d10] Shishido-Topel also predicted that the amount of spent fuel generated by 2000 will be 40,000 metric tons (MTU).

However, the State of Nevada has demonstrated that Yucca Mountain will probably hold about 20% of the total 85,000 MTU of spent fuel earmarked for the facility. (Page 2287, Lines 4 -19.) [State of Nevada, Nuclear Waste Project Office, Scientific and Technical Concerns, pp.8-11.]

Recently, The New York Times reported concerns from scientists at Los Alamos National Laboratories. Dr. Charles Bowman warned that plutonium would remain after the steel casks holding the nuclide dissolved. Plutonium could then migrate and concentrate. ["The New York Times," p.1, March 13, 1995.]

As noted earlier, certain generic challenges face every nuclear power plant [See *infra* Discussion II-C.] Spent fuel storage is no exception. Two consulting engineers for Pennsylvania Power & Light warned that flaws at Susquehanna and the other 37 BWRs could result in a loss of pool cooling water that shields the partially spent uranium fuel. Their concerns languished for almost a year; yet, both engineers assert that PP&L is the best utility they've ever worked for. These flaws already exist at Pilgrim and the Washington Nuclear Power-2 reactors. In fact, PP&L who originally played down the engineers report, agreed in June 1994 to modify both their spent fuel pools to make them less likely to boil. [Andrew Maykuth, *The Dallas Morning Star*, 4A, July 31, 1994.]

PP&L's recent behavior relating to finding a solution for a permanent spent fuel storage facility has been disappointing. When the State of Nevada balked at hosting a HLW facility, PP&L promptly poured $66,673 into a $3.3 million advertising campaign coordinated by the Edison Electric Institute to convince a state that has no nuclear generating stations to host the nation's spent nuclear fuel. More recently, PP&L joined a consortium of 33 utilities in December 1994 who have actively pressured the Mescalero Apaches to host a Monitored Retrievable Storage facility. Both initiatives were funded by the PP&L rate payer.

Rather than seeking constructive solutions to a decades-old problem, PP&L has invested in public relations gimmicks at the ratepayers expense. If a long term solution to HLW disposal is not found in the next several years, Susquehanna will most likely be shut down prematurely due to a lack of storage space.

E. Low Level Radioactive Waste Disposal

Susquehanna is currently serving as a temporary repository for low-level radioactive waste (LLRW). (This term is imprecise and "low-level" is not analogous to low-risk.) Mr. George Jones maintained in his testimony, "[t]here's no intent to store permanently rad waste at this site." He also admitted that the facility would not meet the standards set by the Appalachian Compact in regards to a permanent LLRW facility. (Page 2270, Lines 6-11.)

PP&L is overly optimistic about the date a facility in Pennsylvania will be ready to accept waste. "Storage at the plant is an interim measure until a permanent, monitored above-ground [actually the facility is specified to be above *grade*] disposal site is ready in Pennsylvania. That facility, expected to open in 1999, will serve nuclear power plants, hospitals, medical research labs, universities and hundreds of industries that use radioactive materials." (PP&L, "Inside Susquehanna," Special Office of the President, Page 2.)

Unfortunately, the siting process is in complete disarray. The recent audit by the Pennsylvania House Legislative Budget and Finance Committee reported that Chem Nuclear, the site contractor, will require at least another five years to complete its work and an additional $55 to $89 million absent any legal or technical challenges. [For instance, District Judge William Moody ruled against the siting of a low-level waste facility on seismic, hydrological and aesthetic grounds. *See* 19 Ecol. L. Q. 481 (1992) citing El *Paso v. The Texas Low-Level Radioactive Waste Disposal Authority.*

Chem Nuclear is under increased scrutiny for attempting to bill the Commonwealth for a Christmas party ($14,297.05), wine, beer and liquor for the Christmas party ($2,702.74), football tickets ($76), golf trophies ($153.92), employee gift certificates for Thanksgiving turkeys ($2,828.09), and interest on penalties and delinquent taxes ($14,311.59) as "support" expenses for constructing the facility. In addition, the audit recommended separating the PA Department of Environmental Resources to avoid a conflict of interest. The DER currently supervises and regulates the siting of the proposed, low-level radioactive waste site in Pennsylvania.

Mr. La Guardia based his cost estimates for low-level radioactive waste disposal on the assumption that the Appalachian Compact would be available when the SESS closes (Page 1034, 17-20). He concluded that the disposal of LLRW is the most expensive component in the decommissioning formula (Page 2091, Lines 21-25.) Furthermore, Mr. LaGuardia conceded it may be necessary to recomputate cost estimates for disposal because it now appears imminent that Barnwell will open for seven to ten years for all states except North Carolina (Page 2108, Lines 4-9.)

In addition to recomputing the cost of LLRW disposal downwards, the reopening of Barnwell could further postpone the siting of a waste facility in Pennsylvania. Marc Tenan, Appalachian Sates LLRW Commission executive director observed: "If Barnwell's going to open to the entire country for at least the next 10 years, is there really a pressing need to continue work on regional disposal facilities?" ("ACURIE Newsletter, About Low-Level Radioactive Waste Management," May 1995, p.1)

TLG's decommissioning estimates from a dose assessment concentrated on the half-life of the radionuclides cobalt-60 and cesium-137. The timing of decommissioning is based to a large degree on the period in which the above mentioned isotopes decay and present an amenable workplace.However, Mr. LaGuardia stated his unfamiliarity with the term hazardous life.

Witness: "The half-life is the period of time a radionuclide takes to decay to half the radioactive level that occurred during that period. The hazardous life generally is referred to chemical hazardous materials which don't go by the same definition. I'm not familiar with that term with respect to radionuclides of concern." (Page 2118, Lines 1-6.)

This is a glaring and costly omission. The hazardous life is ten to twenty half lives.Therefore, the hazardous life of cobalt-60, (mostly a gamma medical source) is at least 52.7 years and cesium-137, (fission product) is at least 301 years. (Projected hazardous life is based on half life values in the CRC Handbook of Chemistry and Physics, 1988). Moreover, as Mr. LaGuardia attested (Page 2100, Line 24), there are conflicting radiation clean-up standards for soil, water and surface as defined by the Environmental Protection Agency and the Nuclear Regulatory Commission and each agency has conflicting cleanup standards for site restoration. (Witness, LaGuardia, Page 2099, Lines 20-25 and page 2100, Lines 1-18.)

[For further discussion see FR 52061, October 23, 1981; 42 FR 60956, November 30, 1977; 40 CFR 192, 12, July, 1989 and US NRC, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use of Termination of Licenses for Byproduct, Source, or Special Nuclear Material." Policy and Guidance Directive FC 83-23, Division of Industrial and Medical Nuclear Safety, Washington, DC, August, 1987.]

III. STATEMENT OF FACTS AND LAW

A. Imposition of Nuclear Operating Costs onto Ratepayers

United States jurisprudence has never recognized the right of utilities to recover imprudent, highly speculative utility expenditures. *Bluefield Water Works & Improvement Company v. Public Service Commission of the State of West Virginia*, 262 U.S. 668, 678 (1923) (no "constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures"); *State of Missouri ex rel. Southwestern Bell Telephone Company v. Public Service Commission of Missouri*, 262 U.S. 276, 289 91923) (an "abuse of discretion . . . by the corporate officers" disallows recovery for those expenditures). This emphasis, not on micro management of the corporate leadership of the utility, but on the preservation of the legitimate regulatory authority of the states, was magnified in *Pike County Light and Power Company v. Pennsylvania Public Utility Commission*, 465 A.2d 735 (Pa. Cmwlth, 1983), in which the Commonwealth Court of Pennsylvania stated that:

> The electric utility's reliance on its parent company as a source of power represented an abuse of management discretion in consideration of available alternative supplies of electricity, thus requiring a reduction in its purchase power expense.

In the same case, the court stated that the "PUC has broad discretion in ratemaking matters" and that the actions of the utility were imprudent based upon the availability of lower cost power and the failure of the utility to pursue this alternative. Id. at 739.

This "prudent investment" approach was also explored in *New Orleans Public Service, Inc. v. Council of the City of New Orleans*, 491 U.S. 350 (1989), in which the State utility commission questioned the utility's actions in undertaking an investment in a nuclear generating station. The Supreme Court was asked by the utility to force the New Orleans City Council to grant the utility an increase in retail rates as determined by the FERC, after the District Court had refused to rule on the basis of the abstention doctrine. Id. at 355. The Council had refused to grant the retail rates, and stated that the utility's "oversight and review of its Grand Gulf obligation . . . was uncritical and severely deficient." Id. at 356 (citing App. 24)(citation omitted). The Council also stated that the utility "acted imprudently in failing to reduce the risk of its Grand Gulf commitment, in the wake of the Three Mile Island nuclear accident in March, 1979, 'by [not] selling all or part of its share [in Grand Gulf] off station." Id. at 357. The Court declared that the abstention doctrine did not apply to the case, and reversed and remanded the case for further consideration to the District Court.

Other courts have also held that the imprudent activity of the utility in investing in nuclear generating capacity is a relevant factor to be taken into consideration when determining the amount of a rate increase request. In *Pa. PUC et al. v. Metropolitan Edison Company*, 141 P.U.R. 4th 321 (1993), the Commission was faced with a request from Met-Ed for a rate increase prompted by the TMI-2 accident and subsequent need for decommissioning. In its threshold inquiries, the Commission explored whether the decommissioning costs were a "necessary and reasonable cost of doing business." Id. at 328. In addition, the Commission sought to determine whether the actions following the TMI accident were "imprudent or improper." Id. The Commission then noted that "no challenge ha[d] been made to the overall reasonableness of decommissioning costs."

Given the uncertainty surrounding decommissioning, radioactive waste costs, unavailability of radioactive waste disposal facilities, and increased safety concerns surrounding nuclear plant operation, the prudency of the utility's decision to dedicate large amounts of capital to the nuclear venture are called into question.

The wild fluctuations of decommissioning costs based in large part upon the inability of the nuclear industry to maintain a nuclear generating plant for its full predicted operating life offered sound reasoning for a deviation in energy planning by the corporate management of PP&L. Reasonable and prudent utility decision-making demand more than a simple acknowledgement of an industry-wide change in the form of a rate hike request. As stated by the Court in *Duquesne Light Co. v. Barasch,* 488 U.S. 299 (1989), the proper scope of analysis for the Commission is whether the decisions at the time, were "reasonable and prudent."

As reflected by the Commissions and the courts in many of the above cases, an extensive prudence inquiry is undertaken by the Public Utilities Commission under Sections 515 and 1308(f) of the Public Utility Code whenever a utility requests rate recovery based in whole or in part on the cost of constructing an electric generating unit. The roots of this prudence inquiry were discussed by the Commission in *Pa. PUC v. Pa. Power Company,* 85 PUR 4th 323(1987), in which the Commission explained that a prudence review is demanded by the premise that "[I]t is the utility, not its ratepayers, which selects the firms which work on a construction project. Therefore, the utility, not its ratepayers, must bear the consequences of a firm's failure to perform adequately." Id. at 336. In addition, the Commission stated that rate recovery may be denied even if a utility has acted prudently on the basis of inadequate performance by

its agents, contractors, or subcontractors. Id. In the instant case, the decisions involving investment alternatives in the nuclear field were not made by the ratepayers, but by the corporate management. A solid analogy can be drawn from the reasoning in *Pa. Power* to the instant case concerning the hands in which the decision making powers reside and the subsequent allocation of costs.

An extensive prudence review is necessary in rate increase request proceedings to determine whether corporate mismanagement has resulted in costs that are then unjustly transferred to the ratepayers. In a forceful dissent filed by Commissioner Joseph Rhodes, Jr., to the decision of the Pennsylvania PUC in *Pa. PUC v. Metropolitan Edison Company*, 141 PUR 4th 321 (1993), Commissioner Rhodes disagreed with the balance struck in the Majority opinion between costs borne by the shareholder and costs borne by the ratepayer. In discussing the equity of the arrangement by which Met-Ed ratepayers were forced to pay rates which included the costs of decommissioning TMI-2, Rhodes stated the relevance of this case to future nuclear plant decommissioning cases:

> Premature retirements bear great similarities to TMI-2 because they involve liabilities for premature retirements and decommissioning. Therefore, the policy set forth in determining who should pay for TMI-2's decommissioning grows in significance because it may well establish a precedent for additional early retirement cases that might involve substantial rate increases.

Rhodes characterized the equitable considerations in this case between the ratepayers and the shareholders in a simple but direct question: "Is it fair to impose these costs on ratepayers?"

In *Re Wolf Creek Nuclear Generating Facility*, 70 PUR 4th 475 (1985), the Kansas State Corporation Commission was confronted with the prudency of the construction of a nuclear generating plant. The Commission discussed risk assumption and risk sharing through a summary of the testimony of one of the intervener's witnesses, who testified to the proper role of regulation in the determination of rates. The witness, Dr. Sturgeon, explained that:

> One of the goals of public utility regulation is to create the same results within the regulated industry as would occur in a competitive market. In a competitive market, if a firm does not use the efficient alternatives, it must either exit the market or receive a lower than normal return. Id. at 528.

Another witness, Mr. Drazen, argued that "Even without a showing of imprudence, shareholders should bear a portion of the cost of Wolf Creek since regulation is a surrogate for competition." Id. at 529

The Corporation Commission declared that the "risk-sharing" approach advocated by the witnesses had considerable merit. It continued to discuss the need for "clear, equitable, and strong risk-sharing policies to be established by regulatory commissions to be able to deal with the consequences of poor planning, even when no imprudence is demonstrated."

On the issue of decommissioning, the Commission stated that "Decommissioning cost estimates are inherently uncertain and speculative" and that "[t]o date, there has been no actual experience decommissioning a large, commercial nuclear plant and cost estimates have been traditionally low." In addition, the Commission held that "The current shortage (indeed nonexistence) of the site for the disposal of large quantities of radioactive waste makes detailed estimates of shipping

distance and cost virtually impossible." Id. at 540-41. In the *Wolf Creek* rate case, Mr. LaGuardia (also a Company witness in the instant case) failed to include inflation in his cost estimates and assumed a forty year operating life for the nuclear plant. Id. On the basis of this omission and the speculative predictions of operating life, the Commission chose a "midpoint" of LaGuardia's testimony.

The Commission also declared, "We believe that the NRC and general industry estimates of 30 years is a valid and realistic life to utilize for purposes of decommissioning estimates." Id. at 541.

Additionally, the Commission cited to NRC guidelines that suggested five criteria for evaluating alternative financing mechanisms for nuclear decommissioning . One of the components of analysis in the discussion was titled "Intergenerational equity - that the cost of decommissioning be spread equitably to all ratepayers throughout the life of the facility." Id.

The concerns expressed in the various cases discussed by the Commissions vested with the responsibility of approving rate hike requests, and recovery of new construction costs, are valid and applicable to the instant case. An extensive prudence review of the costs incurred by the Company in the construction of Susquehanna nuclear plant and the subsequent decision by PP&L in its continuing operation is mandated by the speculative and imprudent nature of the corporate management. PP&L entered into the nuclear venture of Susquehanna nuclear with full and complete knowledge of the uncertainties and pitfalls that serve as the foundation of the nuclear industry. The present operating status of U.S. nuclear facilities bear out this premise:

no commercial nuclear generating facility has completed its full operating life, due to safety and economic considerations, nor has a safe, permanent repository been found for the disposal of high-level and low-level radioactive waste.Clearly, the ratepayer *should not be made to bear the brunt of expenses incurred by premeditated imprudent* and speculative management decisions. Once again, the admonishment of Commissioner Rhodes is pivotal: "[A]side from whether it is legal, is it fair to impose these costs on ratepayers?"

IV. ARGUMENT

Mr. Epstein allows the Susquehanna nuclear power plant is a "used and useful" generating facility at this point in its operating history. The Transcripts in these hearings clearly demonstrates that this facility will not operate for its entire projected life of forty years. While PP&L is entitled to recover a portion of decommissioning funding through the rate making process, the Company must also assume responsibility for its business decisions. PP&L aggressively sought to license, construct and operate a nuclear facility despite the fact that the riddle of how to resolve the "back-end" of nuclear power production, i.e. (nuclear waste disposal and decommissioning) had not been solved. To allow PP&L to recover 100% of decommissioning funding from the rate payer would be a *de facto* endorsement of corporate socialism. That is, shareholders profit from their investment decisions but are accorded rate relief when their imprudent and speculative decisions become uneconomical.

Mr. Epstein suggests the following formula be adopted by the Pennsylvania Public Utility Commission in regard to rate recovery for the decommissioning of the Susquehanna Electric Steam Station. Allow full recovery for the Nuclear Regulatory Commission's official projections for the cost to decommission Boiling Water Reactors. That figure is currently set at $131.8 million (1986 dollars) for DECON; SAFESTOR $128.3 million (ten years), $131.4 million (30 years) and $106.1 million (100 years). These figures are based on a 3,400 MWT or greater. For the purpose of the study, Batelle Pacific Northwest Laboratories, the contractor, used WNP-2 (Washington Nuclear Power Plant-2) (1112 MWe) (operated by the Washington Public Power Supply System) as a reference reactor. The inflation factor formula is:

(0.75 L + 0.07 E + 0.18 B) + TAXES/INSURANCE

Where:

L = Labor & materials

E = Energy & Transport,

B= Waste burial.

This formula allows the costs to be indexed to any generic increases projected by the Commission. [Decommissioning Costs Reassessment: Briefing for the TMI-Advisory Panel, September 23, 1995, Dr. Carl Feldman.] Funding in excess of the NRC's financial goals should be paid into an external segregated fund by the rate payers beginning immediately. However, should the SESS shut down prematurely, the entire residue of decommissioning funding must necessarily be derived from shareholder profits.

V.CONCLUSION

The issue of rate payer equity and mandated feasibility of shared costs for PP&L investments are essential to this case. The Company is already on record in these hearings as being disgruntled with the manner in which decommissioning costs are unfairly distributed among rate payers. Mr. Douglas A. Krall, Manager-Integrated Resource Planning for PP&L is on record decrying the current decommissioning formula:

Mr. Epstein: "That if the rate increase for decommissioning fossil fuel plants are delayed future customers would unnecessarily be at risk."
Mr. Krall: "Yes. There would be an exposure that a customer who came on the last day of operation of the plant would get very little service from the plant and end up paying the whole cost of decommissioning." (Page 1925, Lines 16-24.)

Mr. Epstein: "But you would not be adverse to assessing future customers who got no electrical benefit from a plant decommissioning costs?"
Mr. Krall: "It doesn't seem to me to be an equitable situation." (Page 1927, Lines 9-13.)

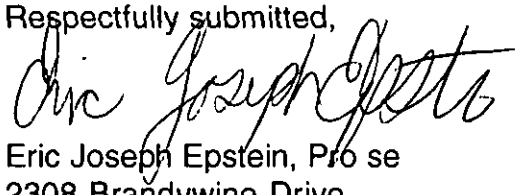
Clearly, a formula must be established that recognizes rate payer equity and prevents intergenerational hostility. The Company has been pursuing a billing policy articulated by Luther J. Carter:

> These industry actors, for the most part, find themselves nicely insulated from the costs of waste management. The Price-Anderson Act, for example limits industry liability, and the nuclear waste policy act allows utilities to pass waste management costs through to ratepayers. Thus nuclear waste management costs, like nuclear wastes, are a residue of the 1950s nuclear promotion policy. Moreover, a portion of nuclear wastes and their management costs is the result of improperly underpricing nuclear electricity and creating an over-investment in nuclear plants and equipment. As a result, more waste than optimum was created. Furthermore, waste management costs are to be absorbed by taxpayers and ratepayers instead of the shareholders of the industry actors who put their externality-creating products on the market without fully accounting for social costs. [Luther J. Carter, "Jurimetrics Journal," Fall , 1988. 29 JURIM J 97.]

Unless a more equitable funding formula for decommissioning is established, rate payers who are not yet born will be burdened for payment for the cleanup of a plant that they derived no benefit from. Society as a whole, and the Company in specific, must assume responsibility for the decisions it makes. Creating and perpetuating intergenerational problems is not a constructive, fair or equitable resolution.

The Company must also shoulder a proportion of decommissioning costs that are beyond the normal costs of decommissioning a nuclear power plant as established by the Nuclear Regulatory Commission. In fact, the Company should welcome this development as a precursor of marketplace dynamics.

Respectfully submitted,



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JUNE 14, 1995

ORIGINAL

Before the
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PENNSYLVANIA PUBLIC UTILITY COMMISSION, ET AL.	:	
v.	:	Docket No. R-00943271
PENNSYLVANIA POWER and LIGHT COMPANY	:	

CERTIFICATION OF SERVICE

I hereby certify that I have this day served a true and correct copy of the foregoing document upon the individuals named below by US mail or hand delivery in accordance with the requirements of Section 1.54.

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