UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
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PUBLIC SERVICE ELECTRIC & GAS COMPANY, et al.	)	Docket No. 50-272 (Proposed Issuance of Amendment to Facility Operating License No. DPR-70)
(Salem Nuclear Generating Station, Unit 1)	)	

LICENSEE'S STATEMENT OF MATERIAL FACTS AS TO WHICH THERE IS NO GENUINE ISSUE TO BE HEARD

Colemans' Contentions 2 and 6

1. The only materials used in the fuel storage racks, the rack interties and wall restraints are Type 304 stainless steel and Boral material.

2. The Boral material is sealed between an inner and outer stainless steel shroud.

3. The stainless steel shroud protects the Boral from exposure to the spent fuel pool environment.

4. The material properties for structural components used in the design and analysis of the rack were taken from Appendix I of Section III of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code.

5. Type 304 stainless steel is compatible with the spent fuel pool environment.

6. Type 304 stainless steel is utilized in the present spent fuel racks.

7. Type 304 stainless steel is widely used in the nuclear industry for applications similar to the Salem Unit 1 spent fuel pool.

8. Stainless steel fixtures have been exposed in pools up to 20 years without evidence of degradation.

9. Salem Unit 1 utilizes Zircaloy clad fuel.

10. Zircaloy clad spent fuel has been stored in pools for up to 18 years without evidence of degradation.

11. The replacement of the racks is being conducted pursuant to a quality assurance program meeting the requirements of 10 C.F.R. Part 50, Appendix B.

12. Nondestructive testing of the fuel cells has been conducted to assure at least 95% leak tightness with 95% confidence level.

13. A helium leak test capable of detecting any significant leak in the stainless steel shroud was utilized to assure leak-tightness.

14. Exxon Nuclear Company has conducted a series of tests to determine the potential effects of a hypothetical leak in the stainless steel shroud.

15. A potential leak could, at most, cause the inner shroud to bulge and move toward the center of the cell.

16. In the unlikely event that a leak exists in a fuel storage cell after installation in the pool and before fuel is inserted, the worst potential consequences would be failure to be able to insert the fuel, losing the affected cell from service.

17. Prior to loading fuel in any location, a procedure will be utilized to determine whether cell swelling exists at that location and whether the cell can be made serviceable.

18. If a leak develops in a fuel cell with fuel already in place, the most severe result would be that the fuel could not be withdrawn with the normal fuel withdrawal force of the fuel handling machine.

19. If a leak develops in a fuel storage cell with fuel already in place, semi-remote tooling would be utilized to provide vent holes in the top of the storage cell to relieve the pressure and permit routine removal.

26. Experments conducted by Exxon Nuclear Company show that simulated storage cells with a leak simulating hole will sustain aluminum corrosion which will consume only a small percentage of the aluminum in the Boral core after a 40 year exposure and B_4C particles would not be dislodged.

27. PSE&G has committed to a long term fuel storage cell surveillance program, utilizing the same materials and manufacturing procedures as are specified for the fuel storage cells.

28. The planned frequency of examination under this program would be about one year after rack replacement and about every two years thereafter.

29. The minimum required density of Boron is assured by the quality assurance program which utilizes chemical tests and batch traceability.

30. Dropping of a spent fuel element over the racks would only affect the upper seven inches of the lead-in section of the racks and no effect on criticality would result.

31. The fuel handling crane has load limiting devices which render it incapable of lifting or tipping even a single spent fuel rack module.

Colemans' Contention 9 and LACT Contention 6

32. Increasing the storage capacity of the spent fuel pool will have a negligible environmental impact.

33. If the unenlarged capacity of the Salem Units 1 and 2 fuel pools were shared jointly, both pools would be full by 1983.

34. It is highly unlikely that an Independent Spent Fuel Storage Installation ("ISFSI") could be available to accept fuel by 1983 or 1984.

35. The environmental impacts of the extra handling of irradiated spent fuel, including the dose received by workers during that transfer, would have to be weighed against any alternative involving a transfer of fuel from the Unit 1 spent fuel pool.

36. It is unlikely that the Hope Creek units would be sufficiently complete to enable fuel to be stored prior to the unmodified Salem unit fuel pool being full.

37. Installing racks capable of storing Salem Unit 1 fuel in the Hope Creek units would limit storage of spent fuel at these units.

38. It is unlikely that there will be storage space available at any other reactor for Salem Unit 1 spent fuel prior to the time that the unenlarged fuel pool would be filled.

39. The AGNS Barnwell reprocessing plant is not available to store Salem Unit 1 fuel prior to the Salem Unit 1 fuel pool being filled.

40. The planned Exxon Nuclear Company storage pool at its proposed Oak Ridge, Tennessee reprocessing facility will not be available to store Salem Unit 1 fuel prior to the Salem Unit 1 fuel pool being filled.

41. The fuel storage pools at the Morris, Illinois facility and Nuclear Fuel Services facility at West Valley, New York will not be available to store Salem Unit 1 fuel prior to the Salem Unit 1 fuel pool being filled.

42. Costs associated with storage at an ISFSI would be greater than the costs of installing new racks at Salem Unit 1.

43. Any interim fuel storage provided by the U.S. Department of Energy would not be available before 1984.

44. It is prudent from an operational standpoint to maintain the capability to discharge a full core from the reactor into the spent fuel pool.

45. Disposal of the spent fuel from Salem Unit 1 outside the United States is not a viable alternative.

46. The incremented replacement power costs associated with a shutdown of Salem Unit 1 would be at least $300,000 per day.

47. The costs for replacing the fuel storage racks for Salem Unit 1 are $3,000,000.

Colemans' Contention 13

48. Most of the releases of radioactive material which contribute to offsite doses occur as a result of the initial transfer of fuel from the reactor to the fuel, in initial storage, and during its transfer from the fuel storage pool to the shipping cask for shipment offsite. The isotope of interest as far as offsite doses during the incremental period of fuel storage is concerned is Kr-85.

49. Even conservatively calculated, the additional dose due to the change in spent fuel racks in both Salem Units 1 and 2 attributable to Kr-85 would be 0.005 mrem/year and less than 0.005 manrem/year to the population within 50 miles.

50. Other than the very slight increase in radioactive effluents there are no other cumulative effects resulting from the fuel pool storage increase.

LACT Contention 3

51. PSE&G's application to the NRC for permission to enlarge the capacity of the Salem Nuclear Generating Station, Unit 1, spent fuel pool relates only to the storage of the additional quantities of spent fuel from that unit.

52. Application has been made to the NRC to increase the spent fuel pool capacity of Salem Unit 2 to 1170 elements.

53. PSE&G has no plans for utilizing the additional capacity in the Salem Unit 1 fuel pool from Salem Unit 2, either of the Hope Creek units or any other nuclear generating station.

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LICENSEE'S MEMORANDUM IN SUPPORT OF ITS MOTION FOR SUMMARY DISPOSITION

I. Preliminary Statement

Summary disposition is an appropriate remedy whenever it becomes apparent that an intervenor's admitted contentions fail to present genuine issues appropriate for resolution in the proceeding.1/ Motions for summary disposition under 10 C.F.R. §2.749 are analogous to motions for summary judgment under Rule 56 of the Federal Rules of Civil Procedure and the same standards are generally applied.2/

Summary disposition is authorized where the moving party has shown "that there is no genuine issue as to any material fact and the moving party is entitled to a decision as a matter of law.3/ The requirement that the facts as to

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1/ Mississippi Power and Light Company (Grand Gulf Nuclear Station, Units 1 and 2), ALAB-130, 6 AEC 423, 424-425 (1973).

2/ Pacific Gas & Electric Company (Stanislaus Nuclear Project, Unit No. 1), LBP-77-45, 6 NRC 159, 163 (1977). Alabama Power Co. (Joseph M. Farley Nuclear Plant, Units 1 and 2), ALAB-182, 7 AEC 210, 217 (1974); Public Service Co. of New Hampshire (Seabrook Station, Units 1 and 2), LBP-74-36, 7 AEC 877, 878-879 (1974).

3/ 10 C.F.R. §2.749(d).

which there is a genuine issue be "material" is met if their existence or non-existence might affect the result of the action.[4/] "A factual issue that is not necessary to the decision is not material within the meaning of Rule 56(c) and a motion for Summary judgment may be granted without regard to whether it is in dispute."[5/] Thus, judgment must be rendered where, although disputable factual contentions remain, "the facts in the case which are undisputed would nevertheless require judgment as a matter of law."[6/]

Although the burden of showing the absence of any genuine issue of fact is on the moving party, "a party opposing the motion may not rest upon the mere allegations or denials of his answer; his answer . . . must set forth specific facts showing that there is a genuine issue of fact."[7/] If the party opposing the motion fails to come forward with competent evidence that genuine issues of fact

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4/ Hahn v. Sargent, 523 F.2d 461, 464 (1st Cir. 1975).

5/ 10 C. Wright & F. Miller, Federal Practice and Procedure, §2.725, at 507 (1973).

6/ John Hopkins University v. Hutton, 297 F.Supp. 1165 and 1198 (D.C. Md. 1968), aff'd in part, rev'd in part on other grounds, 422 F.2d 1124 (4th Cir. 1970).

7/ 10 C.F.R. §2.749; Gulf States Utilities Co. (River Bend Station, Units 1 and 2), LBP-75-10, 1 NRC 246, 248 (1975). Accord Cleveland Electric Illuminating Co. (Perry Nuclear ower Plant, Units 1 and 2), ALAB-443, 6 NRC 741, 753-756 (1977), wherein summary disposition was held to be improper where the moving party failed to establish, prima facie, the basence of a genuine issue of fact. See Adickes v. Krese & Co., 398 U.S. 144, 159 (1970); Weahkee v. Perry, ___ F.2d ___, No. 77-1340, slip op. at 19 (D.C. Cir Sept. 26, 1978).

exist to be tried, the undisputed statements contained in the movant's affidavits are taken as true.[8/]

The Atomic Safety and Licensing Appeal Board recently reaffirmed the use of the summary disposition procedure in another proceeding concerning an increase in storage in a spent fuel pool.[9/]

II. Background

Public Service Electric and Gas Company ("PSE&G" or "Licensee") for itself and as agent for the other owners Atlantic City Electric Company, Delmarva Power and Light Company, and Philadelphia Electric Company, applied to the Nuclear Regulatory Commission ("NRC") for amendment of Facility Operating License No. DPR-70 for Salem Nuclear Generating Station, Unit No. 1 ("Salem Unit 1" or "facility") located in Salem County, New Jersey. The amendment would revise the provisions of the Technical Specifications, Appendix A to Facility Operating License DPR-70, to permit an increase in fuel storage capacity from 264 to 1170 fuel assemblies in the spent fuel pool of the facility. The amendment would also revise design features and associated operating limits for the storage pool, as necessary, to accommodate the storage capacity. The application to increase the fuel pool storage capacity was made on November 18, 1978

8/ Smith v. Saxbe, 562 F.2d 729, 733 (D.C. Cir. 1977), citing Fitzke v. Shappell, 468 F.2d 1072, 1077 (6th Cir. 1972).

9/ Virginia Electric and Power Company (North Anna Nuclear Power Station, Units 1 and 2), ALAB-522, 9 NRC ___ (January 26, 1979), slip op. at 45.

and supplemented on December 13, 1977, February 14, 1978, May 17, 1978, July 31, 1978, August 27, 1978, October 13, 1978, October 31, 1978, November 20, 1978, December 22, 1978, January 4, 1979, January 15, 1979 and January 24, 1979.

On February 8, 1978, the NRC published in the Federal Register (43 Fed. Reg. 5443) a notice of "Proposed Issuance of Amendment to Facility Operating License" concerning the proposed change. In response thereto, three petitions for a hearing were submitted. After a prehearing conference held on May 18, 1978, the Atomic Safety and Licensing Board ("Board") admitted two intervenors, Lower Alloways Creek Township ("LACT") and Mr. and Mrs. Coleman as parties. Requests to participate as interested States pursuant to 10 C.F.R. §2.715(c) were received from New Jersey and Delaware and were granted by the Board.

On January 19, 1979, the NRC Staff transmitted its Safety Evaluation Report ("SER") and Environmental Impact Appraisal ("EIA") to the Board and parties.

Pursuant to the Board's Order Following Special Prehearing Conference dated May 24, 1978, discovery in this proceeding ended on February 9, 1978, three weeks after publication of the SER and EIA.

The following discussion demonstrates that no genuine issue of fact exists with regard to any of the contentions. As a result, the Licensee is entitled to summary disposition and the Colemans and LACT dismissed as parties. Thus no hearing in this matter need be held. A statement of each contention, as granted by the Board precedes the discussion of each matter.

III. Argument

Colemans' Contentions 2 and 6

> 2. The licensee has given inadequate consideration to the occurrence of accidental criticality due to the increased density or compaction of the spent fuel assemblies. Additional consideration of criticality is required due to the following:
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> A. deterioration of the neutron absorbtion [sic] material provided by the Boral plates located between the spent fuel bundles;
>
> B. deterioration of the rack structure leading to failure of the rack and consequent dislodging of spent fuel bundles;
>
> 6. The licensee has given inadequate consideration to qualification and testing of Boral material in the environment of protracted association with spent nuclear fuel, in order to validate its continued properties for reactivity control and integrity.

Contentions 2 and 6 of the Colemans may be conveniently treated together in that they both deal with material property and compatibility considerations relative to the new racks for the spent fuel pool.

The only materials used in the fuel storage racks, the rack interties, and wall restraints are Type 304 stainless steel and Boral material sealed between an inner and outer stainless steel shroud. [Affidavit of Edwin Liden, paragraph 2 (hereinafter "Liden, ¶__")]. The stainless steel shroud protects the Boral from exposure to the spent fuel pool water environment. Boral is a trade name for an aluminum and boron carbide matrix. The material properties for structural components used in the various analyses of the racks were taken from Appendix I of Section III of the ASME Boiler and Pressure Vessel Code. Type 304 was chosen for its compatibility with the spent fuel pool water, which contains boric acid at a nominal concentration of 2000 ppm boron and is the same material which is utilized in the present spent fuel racks. Stainless steel of this type has been widely utilized in the nuclear industry, as described in the Liden Affidavit at ¶¶2 and 3.

The Licensee is unaware of any corrosion or other deterioration of stainless steel in environments similar to the Salem spent fuel pool. Unirradiated stainless steel fixtures have been exposed in pools up to 20 years and Zircaloy clad spent fuel has been successfully stored in pools for up to 18 years without evidence of degradation [Liden, ¶3].

The Licensee has made detailed and comprehensive plans to assure that the fabricated racks are built and installed in accordance with specifications designed to assure their continued ability to perform their intended function. As part of this effort, careful control of the manufacturing process and nondestructive testing of the fuel cells has been conducted to assure at least 95% leak tightness with a 95% confidence level [Liden, ¶5].

The details of the welding processes and other manufacturing and nondestructive and metallographic examination are described in the application [Liden, ¶6]. The quality assurance program includes a helium leak test utilizing a helium mass spectiometer which is capable of detecting very small pin holes, smaller than any which would be significant in the fuel storage cell service environment [Liden, ¶6].

Exxon Nuclear Co., Inc., has conducted a series of experiments to determine the effect of a hypothetical leak in the stainless steel shroud. Such a leak could potentially cause some minor corrosion of the aluminum in the aluminum-carbide matrix and the evolvement of hydrogen gas. The water leaking in the void between the shrouds would compress the gas at the top of the cell until an equilibrium pressure was reached. The hydrogen gas would increase the pressure in the gap between shrouds pushing the water level down until gas bubbles escape at the elevation of the crack. The worst location for a leak would thus be at the bottom due to the higher static pressure. The pressure would cause the inner shroud to bulge and move toward the center of the cell [Liden, ¶7].

These tests revealed that in the unlikely event that a leak in a fuel storage cell exists after installation in the water-filled storage pool and before fuel is inserted, the worst potential consequence would be failure to be able to insert the fuel, thereby losing the affected cell from service. Prior to loading fuel in any location, a procedure will be utilized to determine whether cell swelling exists at that location and to determine whether the cell can be made serviceable [Liden, ¶8].

If a leak develops in a fuel storage cell with fuel already in place, the most severe result would be that the fuel could not be withdrawn with the normal fuel withdrawal force of the fuel handling crane. In this event, semi-remote tooling would be utilized to provide vent holes in the top of the storage cell annulus to relieve the gas pressure on the fuel assembly and permit routine removal [Liden, ¶9].

In another series of tests, Exxon Nuclear examined the ability of the Boral, to withstand the spent fuel pool environment. A number of test coupons of varying configurations, some of which were similar to the storage rack shapes, were exposed to fuel pool type environments for periods of up to one year. The coupons were examined for corrosion rate, pitting, bonding, edge attack and bulging. These experiments showed that simulated storage cells, with a leak simulating hole will sustain aluminum corrosion which will consume only a small percentage of the aluminum in the Boral core after a 40-year exposure. Moreover, while some pitting, edge attack, and internal gas pressurization could occur to Boral plates, B_4C particles would not be dislodged in the process and thus no effect on criticality safety would occur [Liden, ¶10].

The Licensee, in addition to these test programs, has committed to a long term fuel storage cell surveillance program to verify that the spent fuel storage cell retains the material stability and mechanical integrity over its service life under actual spent fuel pool service conditions. Samples of flat plate sandwich coupons and short fuel storage cells are provided for periodic surveillance and testing. The samples are of the same materials and are produced using the same manufacturing and quality assurance procedures specified for the fuel storage cells. One short fuel storage cell and one flat plate sandwich coupon will be prepared such that the Boral material will be exposed to spent fuel pool environment. The planned frequency of examination would be about one year after rack replacement and about every two years thereafter [Liden, ¶11].

For their part, the Colemans admit that the two contentions are not based on specific studies or analysis, but are derived from their "technical advisor's general experience expertise and review of pertinent documents, with special emphasis on one 'Behavior of Spent Fuel in Water Cooled Storage (September, 1976), BNWL 2256,' which describes the very limited experience (i.e., less than ten years) with storage of spent fuel in water cooled environment and discusses corrosion rates leading to deterioration.[10/] Contrary to this characterization of BNWL 2256, as discussed in the Affidavit of Liden at ¶3, this report describes satisfactory storage of Zircaloy-clad fuel for up to 18 years and concludes that low temperatures and favorable water chemistry are not likely to promote cladding degradation. Finally the report concludes that "there are no obvious degradation mechanisms which operate on the cladding under pool storage conditions at rates which are likely to cause failures in the time frame of probable storage." The report states that "there is sufficient evidence of satisfactory integrity of pool-stored fuel to warrant extending fuel storage times and expanding fuel storage capacities" [Liden, ¶3, and Appendix B to the Liden Affidavit at 4].

The focus of these contentions now appears to be limited to "the possibility of degradation or deterioration of the poison material which is relied on to permit the dense spacing of spent fuel particles without experiencing criticality [emphasis supplied]"[11/] which the Colemans postulated

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10/ Intervenor's [the Colemans] Responses to Licensee's Interrogatories dated July 20, 1978 at 1-2. The response indicates that BNWL 2256 was published in September 1976. It, however, appears to have been published in September 1977.

11/ Intervenor's Responses to to NRC Staff's Interrogatories dated August 18, 1978 at 2.

could be "gradual" and could occur in "several adjacent cells."[12/] The intervenors cited instances at the Monticello and Connecticut Yankee facilities for such deterioration.[13/]

Initially, the facilities cited have had their racks supplied by vendors other than Exxon Nuclear Company and thus we submit that experience at these other facilities has limited relevance to the issues in this proceeding [Liden, ¶12]. In any event, PSE&G and Exxon Nuclear Company have, by virtue of their quality assurance programs, nondestructive testing, and long-term sample surveillance program in the fuel pool, assured that problems which have occurred at other facilities are not likely to occur at the Salem Generating Station [Liden, ¶12]. Moreover, the long-term surveillance programs to be conducted by PSE&G and the experimental programs already conducted by Exxon Nuclear assure that there is no health and safety problem associated with the fuel pool, even should the spent fuel pool environment come into contact with Boral. The periodic sampling and testing of the Boral coupons would detect any incipient deterioration. Thus there is no substance to the Colemans' assertions regarding Boral.

In its response to the Staff's interrogatories,[14/] the Intervenors made several additional unsupported allegations concerning these contentions which are discussed and refuted

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12/ Id.

13/ Id.

14/ Id. at 4.

below. It is alleged without basis that there could be a variation such that the minimum Boron density would be such that Keff=1.0 and thus result in accidental criticality. The minimum loading of Boron of .02 gms B-10/cm which results in a conservatively calculated Keff of $\leq$0.95 is assured by specification of a higher average concentration of Boron during the fabrication process [Liden, ¶13]. The density of the Boron is assured by the quality assurance program which utilizes chemical tests and batch traceability to assure the proper loading [Liden, ¶13].

The Colemans allege that upper grid spacer damage would permit a decrease in the center to center space of cells in a local region. We submit that such a hypothetical situation, which could only result from a dropped load, is clearly beyond the scope of the contention. In any event, the Licensee has performed an analysis and conducted an experimental program to determine the effect of dropping a load over the spent fuel storage racks. The local crushing of the cell from such an event is limited to the upper seven inches of the lead-in section, above the rack module upper grid structure and above stored fuel assemblies. Thus, there would be no impact on the assemblies and no change in spacing and no effect on criticality would result [Liden, ¶14].

The next assertion is that Keff could be increased if two or more fuel bundles fail to be inserted fully into the cells due to distortion or swelling of the cell walls. As discussed previously, PSE&G will conduct a program to assure that there has been no swelling of a fuel cell prior to loading of spent fuel [Liden, ¶15].

The Intervenors assert that the fuel handling crane could tip or lift a spent fuel rack module. The spent fuel handling crane has load limiting devices which render it incapable of lifting or tipping even a single module. Moreover the modules are tied together such that the postulated event is not credible [Liden, ¶16].

Thus, for the reasons discussed above, the Licensee is entitled to summary disposition for the Colemans' Contentions 2 and 6.

Colemans' Contention 9

9. The Licensee has given inadequate consideration to alternatives to the proposed action. In particular, the Licensee has not adequately evaluated alternatives associated with the Nuclear Reulatory Commission adopting the "no action" alternative for licensee's application, which would implicate the following:

A. expansion of spent fuel storage capacity at reprocessing plants;

B. licensing of independent spent fuel storage installations;

C. storage of spent fuel from Salem No. 1 at the storage pools of other reactors;

D. ordering the generation of spent fuel to be stopped or restricted (leading to the slow-down or termination of nuclear power production until ultimate disposition can be effectuated);

LACT Contention 1

1. The Licensee has not considered in sufficient detail possible alternatives to the proposed expansion of the spent fuel pool. Specifically, the Licensee has not established that spent fuel cannot be stored at another reactor site. Also while the GESMO proceedings have been terminated, it is not clear that the spent fuel could not by some arrangement with Allied Chemical Corp. be stored at the AGNS Plant in Barnwell, South Carolina. Furthermore, the Licensee has not explored nor exhausted the possibilities for disposing of the spent fuel outside of the U.S.A.

Both PSE&G and the NRC Staff have considered alternatives to the proposed expansion of the capacity of the spent fuel pool. For the Salem Generating Station, the expansion of the storage capacity of spent fuel would have a negligible environmental impact [Liden, ¶17].[15] Moreover, considering its economic advantages, deferral or severe restriction of the action here proposed would result in substantial harm to the public interest.[16]

LACT alleges that "[t]he Licensee has not established that spent fuel cannot be stored at another reactor site." Subpart C of Coleman's Contention 9 raises the same point. As discussed below, it is not practicable to store the spent fuel from Salem Unit 1 at Salem Unit 2 or either unit of Hope Creek Generating Station.

Since Salem Unit 2 is expected to begin operation shortly, and will have an annual discharge of fuel, both unenlarged fuel pools would be full by 1983 even if the capacity of the pools were shared jointly. Due to the uncertainty in the availability of an Independent Spent Fuel Storage Installation (ISFSI) by that time, such an alternative could impact adversely on Unit 2 operation, and can be considered only a short term temporary alternative [Liden, ¶18].

Moreover, the environmental impacts of the extra handling of irradiated spent fuel, such as the dose received by workers during that transfer, would have to be attributed to this alternative inasmuch as the spent fuel pools for the units are completely separated and elements would have to be placed in a cask prior to transfer [Liden, ¶18].

15/ See also EIA at 20.

16/ Id. at 20.

If only the Unit 2 fuel pool were expanded, while additional capacity would be provided, the environmental impacts associated with fuel transfer, discussed above, would have to be weighed against this alternative [Liden, ¶18].

With regard to storage of Salem Unit 1 spent fuel at the Hope Creek units, it is unlikely that these units would be sufficiently complete to enable fuel to be stored prior to the unmodified Salem unit being full. Storage at Hope Creek would involve replacement of some of the Hope Creek racks with racks capable of holding Salem Unit 1 fuel, further limiting storage capacity at those units for their own discharged fuel. Again fuel would have to be transported to these units and those impacts weighed against this alternative [Liden, ¶19].

Considering that the same problem with spent fuel pool storage is being faced by all utilities, it is unlikely that there will be storage space available at any reactor. In this regard, the Staff cities an Energy Research and Development Administration study which found that up to 46% of operating power plants will lose the ability to refuel prior to 1984 without additional spent fuel pool expansion or access to offsite storage facilities [EIA at 18]. In any event, the cost associated with such storage would be at least comparable to those associated with the new racks at Salem Unit 1. Moreover, such alternative has no environmental advantages, while as discussed above, it has environmental impacts associated with an additional transfer of spent fuel [Liden, ¶20].

Next LACT states that "it is not clear that the spent nuclear fuel could not by some arrangement with Allied Chemical Corp. be stored at the AGNS Plant in Barnwell, South Carolina." The Colemans also allege that "expansion of spent fuel pool storage capacity at reprocessing plants" should be considered. These matters have been considered and have properly been rejected.

The Allied-General Nuclear Services (AGNS) reprocessing plant has not yet been licensed to receive and store spent fuel in the onsite storage pool. The Licensee has contacted AGNS and has been informed that in no event will the facility be utilized by AGNS, its owner, for the storage of reactor fuel absent reprocessing [Liden, ¶21]. Considering the President's April 7, 1977 statement deferring indefinitely the commercial reprocessing and recycling of the plutonium produced in the U.S. nuclear power programs, the storage capacity of that facility cannot be relied upon.

The NRC had under review an application by Exxon Nuclear Company for a storage pool and reprocessing facility to be located at Oak Ridge, Tennessee. A construction permit has not yet been issued and in view of the President's announced policy, and the termination of that proceeding by the NRC, reliance upon the construction of a storage pool in time for Salem Unit 1 is not prudent [Liden, ¶22].

The fuel storage pool at the Morris, Illinois facility is being utilized for General Electric Company owned fuel which had been leased to utilities or for fuel which General Electric had previously contracted to reprocess. Other spent fuel is not being stored in the absence of an express commitment to do so. There is no such commitment for Salem [Liden, ¶23]. Similarly, the Nuclear Fuel Services facility at West Valley, New York is not accepting additional spent fuel for storage even from those reactor facilities with which it had reprocessing contracts [Liden, ¶23].

Thus, there is no basis for viewing storage at an existing reprocessing facility as an alternative to expansion of the fuel pool capacity.

The Colemans allege that inadequate consideration has been given to the alternative of "licensing of independent spent fuel storage installations." The Staff has estimated that it would take at least five years to construct an ISFSI.[17/] There have been no concrete plans to build such a facility. Even should one be constructed, the costs would be much higher than those associated with the new racks for Salem Unit 1 inasmuch as a pool structure and supporting systems would have to be erected, and spent fuel transported to such a facility. The environmental impacts associated with constructing such a facility would also be greater than the minor impacts associated with replacing the racks [Liden, ¶24].

17/ EIA at 15.

The U.S. Department of Energy is considering providing interim fuel storage services on a contract basis if private storage is not available. This is not expected to be available before 1983-1984 [EIA at 16]. Inasmuch as there is no assurance that such facilities would be constructed prior to the Salem Unit 1 spent fuel pool being filled, such alternative is unreliable.

All alternatives previously discussed considered that the spent fuel pool could be filled up prior to an alternative being available. This is not the case. After the next (second) refueling for Salem Unit 1, scheduled for the first part of 1980, the facility will lose its capacity to discharge a full core from the reactor. While this capability is not a safety related consideration, it is prudent from an operational standpoint to have such capability. Therefore the loss of ability to sustain full core discharge next year should be weighed in favor of the proposed fuel rack expansion [Liden, ¶25].

LACT suggests that the Licensee should explore the possibilities for disposing of the spent fuel outside the United States. Considering the President's announced policy statement on nuclear policy, it is unlikely that permission would be granted to export spent nuclear fuel. In fact, the President's April 7, 1977 statement on nuclear power policy, states that the U.S. is exploring "measures to assure access to nuclear fuel supplies and spent fuel storage for nations sharing common non-proliferation objectives." 18/ Thus, this alternative is not a viable one [Liden, ¶26].

Finally, the Colemans assert that the NRC should consider "ordering the generation of spent fuel to be stopped or restricted . . . ." The Licensee has estimated that a shutdown of Salem Unit 1 having a net electrical output of 1090 megowatts would cause incremental replacement power costs alone of $500,000 per day, based on the differential costs of producing energy from Salem as compared to production from other available units in the PSE&G and Pennsylvania New Jersey Maryland (PJM) Interconnection [Liden, ¶27]. The Staff, looking at the long term economic impacts rather than the short term incremental effects, factored in a capacity factor range of 60-70% to arrive at annual replacement costs associated with the discontinuance of operation on the order of $300,000 to $350,000 per day. 19/ Using either figure, these costs would still be far in excess of the costs associated with the proposed modification, i.e., $3,300 per fuel assembly or $3,000,000 for the entire cost of replacing the racks [Liden, ¶27].

In "The Intervenors Lower Alloways Creek Township Amended Answers to Licensee's Interrogatories (Set No. 1)" dated February 15, 1979, it was stated that LACT was conducting ongoing research regarding the following subject:

18/ The Department of Energy has stated that it will publish an environmental impact statement concerning the impact of receipt of foreign spent fuel for interim storage and possible ultimate disposal by the U.S. Government.

19/ EIA at 18-19.

> The alternative of permitting expansion may be a statutory regulatory responsibility pursuant to 42 U.S. Code, Section 5877, in that such action by the Nuclear Regulatory Commission would insure and promote action by the Utilities and the Department of Energy for the immediate safe and permanent disposal of spent fuel away-from-reactor sites. By permitting the alternative of reracking the Nuclear Regulatory Commission is avoiding its statutory obligation and perpetuating a potentially unsafe condition. The question of safety and health of the public is paramount. The ramifications of storing 24 cores at Salem #1, Salem #2, and Hope Creek #1 and #2, within a 17 year period is the natural consequences of permitting reracking at Salem #1.

It is apparent that LACT is seeking in the guise of this contention to litigate the question of the permanent disposal of spent fuel. Such matters are clearly beyond the scope of the issues in this proceeding. As this Board has already ruled, it is foreclosed in this proceeding from considering the issue of permanent disposal of spent fuel, citing Northern States Power Company (Prairie Island Nuclear Generating Plant, Units 1 and 2), ALAB-455, 7 NRC 41 (1978).[20/]

The cited section of the Energy Reorganization Act merely requires an annual report to Congress by the NRC and does not shed any light on any further alternative. Finally, the cumulative effects of storage have already been discussed. LACT has not presented anything here which would defeat the motion for summary disposition.

20/ Memorandum and Order dated April 26, 1978 at [illegible]-12, 12-1[illegible], and 14. See also Illinois v. NRC, No. 78-1171 (7th Cir. January 10, 1979), Nuclear Regulation Reports (CCH) ¶¶20, 103 where the court upheld the NRC's decision not to consider the Morris Operation as a de facto permanent storage site.

Thus, the available alternatives have been adequately considered and there is no other alternative compared to replacement of the fuel racks which is better environmentally or economically. The Licensee is entitled to summary disposition on these contentions.

Colemans' Contention 13

> 13. The licensee has failed to give adequate consideration to the cumulative impacts of expanding spent fuel storage at Salem Nuclear Generating Station Unit 1 in association with the recently filed proposed amendment to the application for an operating license at the sister unit, Salem Unit 2. (See Amendment No. 42, Docket No. 50-311, filed April 12, 1978 which proposes modifications of spent fuel storage which the intervenor believes are similar in scope to the Salem Unit 1 application.). For example, the licensee assumes an increase in releases of Kr-85 by a factor of 4.5--due to the factor of 4.5 increase in spent fuel (licensee's application, at 10). A similar increase, absent exceptional controls, can be expected at Salem No. 2, resulting in a cumulative increase in Kr-85 emissions by a factor of 9--almost a full order of magnitude increase. (If similar spent fuel increases are postulated for the companion units, Hope Creek 1 and 2, now under construction, the cumulative increase could rise by a factor of 18, or almost two full orders of magnitude.)

The Licensee has assessed the offsite radiological effects of increasing the capacity of the Salem Unit 1 fuel pool. The results of such an evaluation show that the additional storage capacity causes only an extremely small increase in offsite doses.

Initially, contrary to the allegation contained in the Coleman's Contention 13, the fact that the storage capacity is increased by a factor of 4.5 does not mean that the offsite doses will be correspondingly increased by the same factor. The increase in offsite doses will be significantly less. [Affidavit of Robert P. Douglas at paragraph 3 (hereinafter "Douglas, ¶__")].

Most of the releases of radioactive material which contribute to offsite doses occur as the result of the initial transfer of fuel from the reactor to the pool, the initial storage and during its transfer from the fuel storage pool to the shipping cask for shipment offsite. Inasmuch as these activities would occur whether or not the storage capacity were increased, i.e., the spent fuel rack modification increases only the storage capacity and not the frequency or the amount of fuel to be replaced for each fuel cycle, such doses should not be associated with the requested change [Douglas, ¶4].

Because of the half lives and relative biological significance of the radioactive gases and the lack of any additional tritium released to the environment during the period of interest, the isotope of interest as far as offsite doses is concerned would be Kr-85 [Douglas, ¶¶5-6].

As part of its evaluation to assure compliance with 10 C.F.R. Part 50, Appendix I, a release from each Auxiliary Building of less than one curie per year of Kr-85 with the original racks in place was calculated [Douglas, ¶7]. If it is assumed that the release rate of Kr-85 is increased by a factor of 4.5 to correspond to the increase in the number of fuel elements being stored, a conservative assumption inasmuch as the release of Kr-85 is most likely to occur during the initial handling and first year of storage, and that all Kr-85 releases from the auxiliary building were attributed to releases from the fuel pool, the maximum release from the auxiliary building would be 4.5 curies, an increase of approximately 3.5 ci/yr. The total plant releases of Kr-85 initially projected was 280 ci/yr. Thus the maximum percentage increase due to spent fuel storage pool expansion would conservatively be less than 1.25%. The offsite dose resulting from the additional Kr-85 assumed released would be 1.6×10^{-6} mrem [Liden, ¶3].

The NRC Staff has also independently calculated the additional dose due to the change in spent fuel racks in both Salem Units 1 and 2. Using even more conservative assumptions, the Staff concluded that the dose attributable to Kr-85 would be 0.005 mrem/year and less than 0.005 manrem/year to the population within 50 miles, which are insignificant [Douglas, ¶9].

The NRC Staff also considered the offsite doses due to I-131 and H-3, and concluded they would not be significantly increased [Douglas, ¶¶10-11]. Finally, as the Staff noted:

> In addition, the station radiological effluent Technial Specifications, which will not be affected by this action, will limit the total releases of gaseous activity including those from stored spent fuel. If levels of airborne radioiodine become too high, the air over the SFP can be routed through charcoal filters for the removal of radioiodine before release to the environment [EIA at 8].

Thus, even considering the cumulative radioactive releases from Salem Units 1 and 2, the offsite doses attributable to fuel pool expansion are insignificant. To consider that the Hope Creek fuel pool storage capacity would be increased is speculative at this time. [Affidavit of Robert L. Mittl, paragraph 3, (hereinafter "Mittl, ¶___")]. Certainly no application has been made to date to the NRC for such a change. Considering the scheduled dates for operation, there are additional options available to it which may not require expansion of the spent fuel capacity for the Hope Creek units.

However, were the spent fuel capacity for the Hope Creek units expanded and the increase of radioactive effluent were comparable to those from the Salem Generating Station, the total released from the fuel pools units would still be extremely small [Douglas, ¶12].

Ultimately, compliance with each facility's technical specifications which implements the requirements of 10 C.F.R. Part 50, Appendix I assures that the total releases from that facility, including those associated with the increased storage in the spent fuel pool, are in the "as low as reasonably achievable" range [Douglas, ¶13].

The Colemans have pointed to no other cumulative environmental impact of significance associated with the increase in the storage capacity of the Salem Unit 1 fuel pool and the Licensee is not aware of any [Douglas, ¶14]. Thus, summary disposition should be granted and this contention dismissed.

LACT Contention 3

> 3. While the Licensee has requested increased spent fuel storage capacity at its Salem Unit 1 it has not limited the use of such storage facility to fuel removed from Salem Unit 1. Storage of spent fuel from other units on or off Artificial Island therefore is a possibility and such storage creates many hazards not analyzed by the Licensee in its application. Included among these hazards are those created by unloading spent fuel casks.

PSE&G's application to the NRC for permission to enlarge the capacity of the Salem Nuclear Generating Station, Unit 1 spent fuel pool relates only to the storage of additional quantities of spent fuel from that Unit. PSE&G has no plans for utilizing the additional capacity to store fuel from Salem Unit 2, either of the Hope Creek Generating Station units, or any other nuclear generating station.

The additional capacity is needed for Salem Unit 1. It provides for 15 annual discharges while maintaining the capability for a full core discharge. A similar application to increase the spent fuel pool capacity to 1170 elements has been made for Salem Unit 2 [Mittl, ¶12]. Thus there will be no incentive to store spent fuel from Unit 2 at Unit 1 [Liden, ¶28]. Since the spent fuel storage facilities for the two Salem units are completely separate, if Unit 2 were hypothetically to be stored at Unit 1, transfer of the spent fuel from Unit 2 to Unit 1 in a cask would be required [Liden, ¶29]. Truck casks which would have to be used for the transfer can accommodate only one pressurized water reactor fuel element. The cask would have to be sealed, decontaminated and then opened in the Unit 1 cask pool. This process is slow and cumbersome. Similar considerations would also apply to the storage of spent fuel from the Hope Creek Generating Station at Salem Unit 1. There is no incentive for storing Unit 2 or Hope Creek fuel in the Unit 1 spent fuel pool [Liden, ¶30].

PSE&G has never considered nor has it any plans to utilize the spent fuel storage capacity of the Salem Generating Station for storage of any other facilities' fuel [Mittl, ¶5].

In any event, the storage of fuel assemblies from other facilities at Salem Unit 1 is beyond the scope of this limited proceeding. This Board should take official notice, pursuant to 10 C.F.R. §2.743(i), that the Nuclear Regulatory Commission has required a separate application and has given a separate opportunity for hearing in cases where an applicant sought to transfer fuel discharged from one facility to another facility for storage. Under this precedent, a separate opportunity for hearing would be given for this action and such activities need not be considered under the present Notice of Hearing.[21/]

21/ See Docket No. 70-2623, Duke Power Co., Opportunity for Public Participation in Proposed NRC Licensing Action for Amendment to Materials License, SNM-1773 for Oconee Nuclear Station Spent Fuel Storage at McGuire Nuclear Station, 43 Fed. Reg. 32905 (July 28, 1978). See also Carolina Power and Light Company (Brunswick Steam Electric Plant, Units 1 and 2), Docket Nos. 50-324 and 50-325, Amendment 8 to License No. DPR-71 and Amendment 30 to License No. DPR-62 both dated August 26, 1977 which includes specific approval to store spent fuel from either Brunswick unit in either of the two spent fuel pools.

For the foregoing reasons, LACT Contention 3 should be dismissed.

IV. Conclusion

For the foregoing reasons, Licensee respectfully submits that Licensee's Motion for Summary Disposition should be granted and Mr. and Mrs. Coleman and Lower Alloways Creek Township be dismissed as parties to this proceeding.

Respectfully submitted,

CONNER, MOORE & CORBER

Mark J. Wetterhahn
Counsel for the Licensee

Of Counsel:

Richard Fryling, Jr.
Assistant General Solicitor
Public Service Electric & Gas Company

February 27, 1979

STATE OF NEW JERSEY)
: SS.
COUNTY OF ESSEX

AFFIDAVIT OF ROBERT P. DOUGLAS

ROBERT P. DOUGLAS, being first duly sworn according to law, deposes and states:

1. I am employed by Public Service Electric and Gas Company as Licensing Manager and Acting Environment Manager. In that capacity, I was responsible for the calculation of offsite radiological doses for the Salem Generating Station, including demonstration of compliance with the requirements of 10 C.F.R. Part 20 and 10 C.F.R. Part 50, Appendix I. With regard to the application to the NRC to install new spent fuel racks in the Salem Unit 1 spent fuel pool capable of holding 1170 elements, I developed the radiological dose sections and supervised the response to questions in that area. A copy of my professional qualifications is attached, hereto, as Appendix A and incorporated by reference herein. I have reviewed the allegations made regarding the Coleman's Contention 9 in this proceeding.

2. I have assessed the offsite radiological effects of increasing the capacity of the Salem Unit 1 fuel pool. The results of such an evaluation show that the additional storage capacity causes only an extremely small increase in offsite doses.

3. Initially, contrary to the assertion contained in Coleman's Contention 9, the fact that the storage capacity is increased by a factor of 4.5 does not mean that the offsite doses will be correspondingly increased by the same factor. The percentage increase in offsite dose will be significantly less.

4. Most of the releases of radioactive material which contribute to offsite doses occur as the result of the initial transfer of fuel from the reactor to the pool, the initial storage and again during its transfer from the fuel storage pool to the shipping cask for shipment offsite. Inasmuch as these activities would occur whether or not the storage capacity were increased, i.e., the spent fuel rack modification increases only the storage capacity and not the frequency or the amount of fuel to be replaced for each fuel cycle, such doses should not be associated with the requested change.

5. Radioactive gases which might be released from the spent fuel pool consist of radioactive xenons such as Xe-131m, Xe-133, and Xe-135, radioactive iodines such as I-131 and I-133, Kr-85, and tritium (H-3).

6. During the period of interest, because of the half lives of these isotopes (except H-3) relative to Kr-85, the curies released for these isotopes will be substantially lower than for Kr-85. The release of these isotopes will occur during the first few months of fuel storage. Hence, increased fuel

storage time, i.e., beyond four years, will not result in any increase in releases to the environment of other than Kr-85 and H-3. No dectable additional tritium release is expected as a result of increased fuel storage time. See Paragraph 11, infra.

7. As part of the evaluation to assure compliance with 10 CFR Part 50, Appendix I, using the GALE Code contained in Regulatory Guide 1.109, a release from each Auxiliary Building of less than one curie per year with the original racks in place was calculated. [Application Revision 1 at 10.]

8. If it assumed that the release rate of Kr-85 is increased by a factor of 4.5 to correspond to the increase in the number of fuel elements being stored, a conservative assumption inasmuch as the release of Kr-85 is most likely to occur during the initial handling and first year of storage, and that all Kr-85 releases from this building were attributable to releases from the fuel pool, the maximum release from the auxiliary building would be 4.5 curies, an increase of approximately 3.5 ci/yr. The total plant releases of Kr-85 initially projected was 280 ci/yr. Thus, the maximum percentage increase due to spent fuel storage pool expansion would be consistently less than 1.25%. The maximum offsite dose resulting from the additional Kr-85 would be 1.6×10^{-6} man-rem/year.

9. The NRC Staff, using even more conservative assumptions, has also calculated the additional dose due to the change in spent fuel racks using even more conservative assumptions regarding Kr-85 for both Salem Units 1 and 2. The Staff concluded:

> With respect to gaseous releases, the only significant noble gas isotope attributable to storing additional assemblies for a longer period of time (beyond 4 years) would be krypton-85. As discussed previously, experience has demonstrated that after spent fuel has decayed a few months, there is no significant release of fission products from defective fuel. However, as a measure of conservatism, we assumed that an additional 114 Curies per year of krypton-85 would be released from both units when the modified pools are completely filled. This assumption is based on the expected annual reload cycle and the total number of fuel assemblies that could be stored in the modified pool. This would result in an additional total body dose to an individual at the site boundary of less than 0.005 mrem/year. Such a dose would be insignificant when compared to the approximately 100 mrem/year that an individual receives from natural background radiation. Furthermore, the additional total body dose to the estimated population within a 50-mile radius of the plant that would result from this assumption would be less than 0.005 manrem/year. Such a dose would be less than the natural fluctuations in the annual dose that this population would receive from natural background radiation. Under our conservative assumptions, these exposures represent an increase of less than 0.5% of the exposures from the station evaluated in the Salem 1/2 FES for an individual at the site boundary and the population. Based on the above scoping evaluation, we conclude that the proposed modifications will not have any significant impact on exposures offsite. [EIA at 7]

The increase in the maximum calculated dose to an individual of 0.005 and the increase of 0.005 man-rem/year within 50 miles are truly insignificant even considering the modification of the spent fuel pools for both Salem Units 1 and 2.

10. The Staff also concluded that since the I-131 inventory in the fuel will have decayed to negligible levels during the first four years of storage presently possible with-

out these modifications, the I-131 release will not be significantly increased. [EIA at 8]

11. The NRC Staff also considered the offsite doses due to I-131 and H-3 assuming that the peak bulk spent fuel pool water temperature may go as high as 134° F and may be above 120° F for as long as 32 days following the final incremental discharge of fuel that fills the pool to capacity. The Staff concluded in this regard:

> Most airborne releases from the plant result from leakage of reactor coolant which contains tritium and iodine in higher concentrations than would the SFP water. Therefore, even if there were a temporary higher evaporation rate from the spent fuel pool, the resulting increase in tritium and iodine released from the station would be small compared to the amount normally released from the station without these modifications as was previously evaluated in the FES. In addition, the station radiological effluent Technical Specifications, which will not be affected by this action, will limit the total releases of gaseous activity including those from stored spent fuel. If levels of airborne radioiodine become too high, the air over the SFP can be routed through charcoal filters for the removal of radioiodine before release to the environment. [EIA at 8]

12. Thus, even considering the cumulative radioactive releases from Salem Units 1 and 2, resulting from the installation of the larger capacity spent fuel racks, they are insignificant. However, even were the spent fuel capacity for the Hope Creek units increased and the increase of radioactive effluents were comparable to those from the Salem Generating Station, the total released from the Artificial Island units would still be extremely small. As an example, for four units,

even utilizing the Staff's conservative assumptions, the offsite dose to an individual resulting from the increase storage in all four units would still be in the order of 0.01 mrem per year and the man-rem increase would be in the order of 0.01 man-rem.

13. Ultimately, compliance with each facility's technical specifications which implements the requirements of 10 CFR Part 50, Appendix I assures that the total releases from that facility, including those associated with the increased storage in the spent fuel pool, are in the as low as reasonably achievable range.

14. Based upon my knowledge of the specific impacts associated with fuel pool expansion for Unit 1 and my general knowledge of the Salem and Hope Creek units, aside from the very minor increase in radioactive effluents should all of the units' spent fuel pools be expanded, I am aware of no other cumulative environmental impacts of significance associated with such action.*

Robert P. Douglas
ROBERT P. DOUGLAS

Sworn and subscribed to)
before me this First day)
of February, 1979.)

W. A. Vinnedge
W. A. V[illegible]
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires Mar. 13, 1979

*The hypothesis that Kr-85 releases would increase by a factor of 9 for the two Salem units and by a factor of 18 if the Hope Creek units are considered is incorrect. If the assumption is made that Kr-85 release increase by a factor of 4.5 for one unit, then the factor increase is still 4.5 regardless of the number of units considered. For example, if two units would release 9 curies of Kr-85 with the fuel pool expansion and 2 curies without the expansion (one per unit), the overall factor increase is 4.5.

TECHNICAL QUALIFICATIONS
ROBERT P. DOUGLAS
LICENSING MANAGER
PUBLIC SERVICE ELECTRIC AND GAS COMPANY
APPENDIX A

My name is Robert P. Douglas. My business address is 80 Park Place, Newark, New Jersey. I am Licensing Manager in the Licensing and Environment Department of Public Service Electric and Gas Company. I also am Acting Environment Manager. In this position, I manage all the technical and administrative matters of the Licensing and Analysis Division and the Environment Division of the Licensing and Environment Department. The Licensing and Analysis Division is involved with safety analysis of nuclear and non-nuclear PSE&G facilities, coordination and preparation of reports required for the licensing activities including permit applications, safety analysis reports, and topical technical reports, analysis of radiological impact of generating station operation, coordination of meteorological and radiological monitoring data collection programs and other licensing related responsibilities.

I was graduated from Cooper Union with a B.S. degree in Mechanical Engineering in 1964. In 1966, I received a Master of Science degree in Nuclear Engineering from Massachusetts Institute of Technology. In 1967, I received the Degree of Nuclear Engineer from Massachusetts Institute of Technology. I joined PSE&G in 1967 as an Assistant Engineer in the Mechanical Division of the Electric Department. From 1967 to 1974, my responsibilities included the radiological evaluation of PSE&G nuclear generating stations, safety analysis, site selection studies, environmental program considerations and other areas. In 1974, I assumed responsibility as head of the Nuclear Licensing Group in the Mechanical Division. In 1977, I was promoted to my present position. I have either participated in directly or supervised the preparation of the radiological impact evaluation of Salem Nuclear Generating Station, including analyses required for the PSAR, FSAR, Environmental Report; Appendix I to 10CFR50 evaluation and the radiological impact of the spent fuel pool expansion.

I am a member of the American Nuclear Society, the American Society of Mechanical Engineers, and am a registered professional engineer in New Jersey.

State of New Jersey)
: SS.
County of Essex)

AFFIDAVIT OF EDWIN A. LIDEN

EDWIN A. LIDEN, being first duly sworn according to law, deposes and states:

1. I am employed by Public Service Electric and Gas Company as Project Licensing Manager. In that capacity I was responsible for the coordination of licensing activities related to the application to the NRC to install new spent fuel racks in the Salem Unit 1 spent fuel pool capable of holding 1170 elements. In that capacity, I have become familiar with the design, construction, installation and surveillance of these racks, as well as the confirmatory testing done by the supplier. A copy of my professional qualifications is attached hereto as Appendix A and incorporated by reference herein. I have reviewed the allegations made regarding each of the admitted contentions in this proceeding.

Coleman's Contentions 2 and 6

2. The only materials used in the fuel storage racks, the rack interties and wall restraints are Type 304 stainless steel and Boral material sealed between an inner and outer stainless steel shroud.1/ The shroud protects the Boral from exposure to the spent fuel pool water environment. Boral is a trade name for an aluminum and boron carbide matrix.2/

1/ Application, response to Question 13 dated December 22, 1978.

2/ Application, Amendment 1 at 22.

The material properties for structural components used in the various analyses of the racks were taken from Appendix I of Section III of the ASME Boiler and Pressure Vessel Code. Type 304 was chosen for its compatibility with the spent fuel pool water, which contains boric acid at a nominal concentration of 2000 ppm boron, and is the same material which is utilized in the present spent fuel racks. Stainless steel of this type has been widely utilized in the nuclear industry. The Licensee is unaware of any corrosion or other deterioration of stainless steel in environments similar to the Salem spent fuel pool.

3. Unirradiated stainless fixtures have been exposed in pools up to 20 years without evidence of degradation.[3/] Zircaloy - clad U. S. fuel has been in pool storage for up to 18 years.[4/] Salem Unit 1 uses Zircaloy clad fuel. The Battelle study concludes that pool operators have not seen evidence that stainless-or-Zircaloy-clad uranium oxide fuel is degraded during pool storage, based on visual examinations and radiation monitoring.[5/]

3/ A. B. Johnson, Behavior of Spent Nuclear Fuel in Water Pool Storage, BNWL-2256, September 1977 at 1. A copy of the Summary section of this report is attached as Appendix B and is incorporated by reference herein.

4/ Id.

5/ Id. at 2.

The survey reaches the following conclusions:

> Based on current experience and on an assessment of the relevant literature, prospects are favorable to extend storage of spent nuclear fuel in water pools, recognizing the following considerations:
>
> - Zircaloy-clad fuel has been stored satisfactorily in pools up to 18 years; stainless-clad fuel has been stored up to 12 years.
> - Low temperatures and favorable water chemistries are not likely to promote cladding degradation.
> - There are no obvious degradation mechanisms which operate on the cladding under pool storage conditions at rates which are likely to cause failures in the time frame of probable storage.6/

4. The Salem Unit 1 spent fuel pool, with the new racks installed, has the capacity to hold fuel elements for 15 annual refuelings and retain the capacity for a full core discharge or 18 annual refuelings without that capacity. Thus, there has been actual experience with the storage of Zircaloy clad spent fuel for the period needed to completely fill the Salem spent fuel pool.7/

6/ Id. at 4. The Batelle report recommends that although there is sufficient evidence of satisfactory integrity of pool stored fuel to warrant extending fuel storage times and expanding fuel storage capacities, some additional exploratory examination of selected pool-stored fuel of selected pool-stored fuel is needed if storage is to move into the 20-100 year timeframe.

7/ At that time (or prior thereto) the older elements would presumably have to be removed from the pool to permit further discharges from their reactor.

5. The Licensee has assured that the fabricated racks are built and installed to a high level of quality in accordance with design specifications. As part of this effort, careful control of the manufacturing process and non-destructive testing of the fuel cells was conducted to assure at least 95% leak tightness with a 95% confidence level. (See October 31, 1978 submittal to NRC)

6. The details of the welding processes and other manufacturing and non-destructive and metallographic examination which assure the high degree of leak tightness are described in Licensee's October 31, 1978 submittal to the NRC. Also described therein is a helium leak test utilizing a helium mass spectrometer which is capable of detecting very small pin holes, smaller than any which would be significant in the fuel storage pool environment. (See October 31, 1978 submittal to NRC)

7. Exxon Nuclear Co., Inc. has conducted a series of experiments to determine the effect of a leak in the stainless steel. Such a leak could potentially cause some minor corrosion of the aluminum in the aluminum-boron carbide matrix, and the evolvement of hydrogen gas. Initially, the water leaking in the void between the shroud would compress the gas at the top of the cell until an equilibrium pressure was reached. The hydrogen gas would increase the pressure in the gap between shrouds pushing the water level down until gas bubbles escape at the elevation of the crack.

The worst location for a leak would thus be at the bottom due to the higher static pressure. The pressure would cause the inner shroud to bulge and move toward the center of the cell. (See October 31, 1978 submittal to NRC).

8. These tests revealed that in the unlikely event that a leak in a fuel storage cell exists after installation in the water filled storage pool and before fuel is inserted, the worst potential consequence would be failure to be able to insert the fuel thereby losing the affected cell from service. Prior to loading fuel in any location, a procedure will be utilized to determine whether cell swelling exists at that location. (See October 31, 1978 submittal to NRC)

9. If a leak develops in a fuel storage cell with fuel already in place, the most severe result would be that the fuel could not be withdrawn from the storage cell with a force that is within the limits of the fuel handling crane. In this event, semi-remote tooling will be utilized to provide vent holes in the top of the storage cell annulus to relieve the gas pressure on the fuel assembly and permit routine removal. (See October 31, 1978 submittal to NRC)

10. In another series of tests, Exxon Nuclear examined the ability of the Boral to withstand the spent fuel pool environment. A number of test coupons of varying configurations, some of which were similar to the storage rack shapes, were exposed to fuel pool type environments for periods up to one year.

The coupons were examined for corrosion rate, pitting, bonding, edge attack and bulging. These experiments showed that simulated storage cells, with a leak simulating hole purposely made in the cell, will sustain aluminum corrosion which will consume only a small percentage of the aluminum in the Boral core after a 40-year exposure. Moreover, while some pitting, edge attack, and internal gas pressurization could occur to Boral plates, the inert B_4C particles would attach themselves to the corrosive product and would not be dislodged in the process.

11. The Licensee, in addition to these test programs, has committed to a long-term fuel storage cell surveillance program to verify that the spent fuel storage cell retains the material stability and mechanical integrity over its service life under actual spent fuel pool service conditions. Sample flat plate sandwich coupons and short fuel storage cells are provided for periodic surveillance and testing. The samples are fabricated from the same materials and are produced using the same manufacturing and quality assurance procedures specified for the fuel storage cells. One short fuel storage cell and one flat plate sandwich coupon will be prepared such that the Boral material will be exposed to the spent fuel pool environment. (The details of the program are discussed in Licenssee's Response to NRC Questions dated December 22, 1978).

The planned frequency of examination would be about one year after rack replacement and about every two years thereafter.

12. I am familiar with the problems encountered at the Monticello and Connecticut Yankee[8/] facilities related to spent fuel storage and as discussed below, they present no health and safety problem related to the storage of spent fuel at Salem Unit 1. Initially, the spent fuel racks at these facilities were not supplied by Exxon Nuclear Company, which provided the racks for Salem. Secondly, the quality assurance program carried out by Exxon and PSE&G already described in paragraph five assures the integrity of the racks. Even if there were to be leaks, the experiments conducted by Exxon demonstrate, as previously described, that no health and safety problem exists.

13. The minimum loading of Boron of .02 gms B-10/cm^2 which results in a conservatively calculated K eff of less than 0.95, is assured by specification of a higher average concentration of Boron during the fabrication process. The density of the Boron is assured by the quality assurance program which utilizes chemical analyses and batch traceability to assure the proper loading.

14. The Licensee has analyzed and conducted an experimental program to determine the effect of dropping a fuel assembly over the spent fuel storage racks.

8/ The problems encountered at the Connecticut Yankee facility involved a polymer used as a bonding agent, not Boral.

The local crushing of the cell from such an event is limited to the upper seven inches of the lead-in section, above the rack module upper grid structure and above stored fuel assemblies. Thus, there would be no impact on the assemblies and no effect on criticality safety. (As described in Description and Safety Analysis Spent Fuel Storage Rack Replacement, Revision 1 at 37 and response A-21 submitted on May 17, 1978).

15. It is alleged that two or more fuel bundles could fail to be inserted fully into the cells due to distortion or swelling of the cell walls. As discussed in paragraph 7, PSE&G will conduct a program to assure that there has been no swelling of a fuel cell prior to loading of spent fuel. (See "Handling, Shipping & Receiving Inspection, Spent Fuel Storage Racks and In Plant Testing Program, Spent Fuel Storage, Spent Fuel Storage Racks at 1-2 appended to the October 31, 1978 submittal.)

16. The intervenors assert that the fuel handling crane could tip or lift a spent fuel rack module. The spent fuel handling crane has load limiting devices set at approximately 2500 lbs. which render it incapable of lifting or tipping even a single module, which weighs on the order of 32,000 lbs. Morever, the modules are tied together such that the postulated event is not credible.

LACT Contention 1 and Colemans' Contention 9

17. Alternatives to the proposed expansion of the capacity of the Unit 1 spent fuel pool have been considered. In addition, I would note that the proposed action has a negligible environmental impact.

18. It is not practicable to store the spent fuel from Salem Unit 1 at Salem Unit 2 or either unit of the Hope Creek Generating Station. In the case of Salem Unit 2, since that unit is expected to begin operation shortly and will have an annual discharge of fuel, both unenlarged fuel pools would be full by 1983. Due to the uncertainty in the availability of an Independent Spent Fuel Storage Installation ("ISFSI") by that time (EIA at 16), such an alternative could impact adversely on Unit 2 operation, and can be considered only a short term temporary alternative. Moreover, the environmental impacts of the extra handling of irradiated spent fuel, such as the dose received by workers during the transfer, would have to be attributed to this alternative inasmuch as the spent fuel pools for the units are completely separated and the element would have to be placed in a cask prior to transfer. If only the Unit 2 fuel pool were expanded, while additional capacity would be provided, it would suffer the same environmental impacts associated with fuel transfer as was the case for the case previously discussed, i.e., those associated with fuel transfer.

19. With regard to storage of Salem Unit 1 spent fuel at the Hope Creek units, it is unlikely that these units would be sufficiently complete to enable fuel to be stored prior to the unmodified Salem unit being full. Storage at Hope Creek would involve replacement of the Hope Creek racks with racks capable of holding Salem 1 Fuel, further limiting storage capacity at those units. Again fuel would have to be transported to these units and those impacts weighed against this alternative.

20. Considering that the same problem with spent fuel pool storage is being faced by all utilities, it is unlikely that there will be storage space available at any reactor. The costs associated with such storage would be at least comparable to those associated with the new racks at Salem Unit 1. Moreover, such alternative has no environmental impacts associated with an additional transfer of spent fuel.

21. The Allied-General Nuclear Services ("AGNS") reprocessing plant has not yet been licensed to receive and store spent fuel in the onsite storage pool. I have contacted AGNS and have been informed that in no event will the facility be utilized by AGNS for the storage of reactor fuel absent reprocessing. Considering the President's April 7, 1977 statement deferring indefinitely commercial reprocessing and recycling of the plutonium produced in the U. S. nuclear power programs, the storage capacity of that facility cannot be relied upon.

22. The NRC had under review an application by Exxon Nuclear Company for a storage pool and reprocessing facility to be located at Oak Ridge, Tennessee. A construction permit has not yet been issued and in view of the President's announced policy, and the termination of that proceeding by the NRC, reliance upon the construction of a storage pool in time for Salem Unit 1 is not prudent.

23. The fuel storage pool at the Morris, Illinois facility is being utilized for General Electric Company owned fuel which had been leased to utili 'es or for fuel which General Electric had previously contracted to reprocess. Other spent fuel is not being stored in the absence of an express commitment to do so. There is no such commitment for Salem. (EIA at 14). Similarly, the Nuclear Fuel Service facility at West Valley, New York is not accepting additional spent fuel for storage, even from those reactor facilities with which it had reprocessing contracts. (EIA at 14).

24. Should an ISFSI be constructed, the costs would be much higher than those associated with the new racks for Salem Unit 1 inasmuch as a pool structure and supporting systems would have to be erected, and spent fuel transported to such a facility. The en.ironmental impacts associated with constructing such a facility would also be greater than the minor impacts associated with replacing the racks.

25. All alternatives previously discussed considered that the spent fuel pool could be filled prior to the alternative being needed. This is not quite the case. After the next (second) refueling, scheduled for the first part of 1980, the facility will lose its capacity to discharge a full core from the reactor. While this capability is not a safety related consideration, it is prudent from an operational standpoint to have such capability. Therefore the ability to sustain full core discharge capability should be weighed in favor of the proposed fuel rack expansion.

26. The Company has discounted the possibility for disposing of the spent fuel outside the United States. Considering the President's announced policy statement on nuclear power, it is unlikely that permission would be granted to export spent nuclear fuel. In fact the President's April 7, 1977 statement on nuclear power policy states that the U. S. is exploring "measures to assure access to nuclear fuel supplies and spent fuel storage for nations sharing common non-proliferation objectives".

27. The Licensee has estimated that a shutdown of Salem Unit 1 with a net electrical output of 1090 megawatts would cause incremental replacement power costs alone of $500,000 per day, based on the differential costs of producing energy from Salem as compared to production from other available units in the PSE&G and Pennsylvania New Jersey Maryland ("PJM") Interconnection.

The Staff, looking at the long term economic impacts other than the short term incremental effects, factored in a capacity factor range of 60-70% to arrive at annual replacement costs associated with the discontinuance of operation on the order of $300,000 to $350,000 per day.[9] Using either figure, these costs would still be far in excess of the costs associated with the proposed modification, i.e., $3300 per fuel assembly or $3,000,000 for the entire cost of replacing the racks.[10]

9/ EIA at 18-19

10/ *Id.* at 19

LACT Contention 3

28. PSE&G has also made application to the NRC to expand The Salem Unit 2 fuel pool capacity to 1170 elements utilizing racks supplied by Exxon Nuclear Company, Inc. Thus, as a result of this modification, there will be no need nor incentive to store spent fuel from Salem Unit 2 at Salem Unit 1.

29. Since the spent fuel storage facilities for the two Salem units are completely separate, if Unit 2 fuel were hypothetically to be stored at Unit 1, spent fuel transfer from Unit 2 to Unit 1 in a transfer cask would be required.

30. Truck casks which would have to be used for the transfer can accommodate only one Pressurized Water Reactor fuel assembly. The cask would have to be sealed, decontaminated and then opened in the Unit 1 cask pool. This process is slow and cumbersome. There is therefore no incentive for storing Unit 2 or Hope Creek spent fuel in the Unit 1 spent fuel pool.

31. The Hope Creek Generating Station utilizes two boiling water reactors. Five assemblies for these units are different in size from those utilized in Salem Unit 1 and cannot be stored in the new fuel storage racks in the Salem Unit 1 fuel pool.

Neither is there additional room in the Salem 1 spent fuel pool to place new racks to accommodate such fuel.

EDWIN A. LIDEN

Sworn and subscribed to)
before me this 21st day)
of February, 1979.

W. A. [illegible]
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires Mar. 12, 1979

TECHNICAL QUALIFICATIONS

EDWIN A. LIDEN
PROJECT LICENSING MANAGER

PUBLIC SERVICE ELECTRIC AND GAS COMPANY

My name is Edwin A. Liden. My business address is 80 Park Place, Newark, New Jersey. I am Project Licensing Manager in the Engineering and Construction Department of Public Service Electric and Gas Company and have served in this capacity since 1977. In my present position, I am responsible for directing the licensing activities for the Salem Nuclear Generating Station.

I was graduated from the State University of New York Maritime College with a Bachelor of Marine Engineering degree in 1963. I also served in the U. S. Merchant Marine as a licensed engineering officer.

From 1963 to 1966, I was employed by Newport News Shipbuilding and Dry Dock Company. I was certified by the NRC as Shift Test Engineer on the A2W and C1W naval nuclear power plants. I was the senior shipyard representative on shift during refueling and overhaul operations on both the USS Enterprise and USS Long Branch.

From 1966 to 1967, I was staff engineer at Combustion Engineering, Inc., working on fuel channel development for the heavy water organic cooled reactor (HWOCR) project.

From 1967 to 1970, I was department head at the Saxton Nuclear Facility and, in that capacity, held a Senior Reactor Operator license. I was responsible for nuclear plant maintenance, performance, health physics, radiochemistry, radwaste and nuclear fuel.

From 1970, when I joined PSE&G, until 1977, I have participated in the licensing process for the Salem Nuclear Generating Station which included preparation of the FSAR, Environmental Report, and Safety and Environmental technical specifications.

I am a member of the American Nuclear Society.

EAL:kd
2/15/79

APPENDIX B

Behavior of Spent Nuclear Fuel in Water Pool Storage

by
A. B. Johnson, Jr.

September 1977

Prepared for the Energy Research
and Development Administration
under Contract EY-76-C-06-1830

Battelle
Pacific Northwest Laboratories

BNWL - 2256

BEHAVIOR OF SPENT NUCLEAR FUEL IN WATER POOL STORAGE

by
A. B. Johnson, Jr.

September 1977

BATTELLE
Pacific Northwest Laboratories
Richland, Washington 99352

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SUMMARY AND CONCLUSIONS

Storage of irradiated nuclear fuel in water pools (basins) has been standard practice since nuclear reactors first began operation ~34 years ago. Pool storage is the starting point for all other fuel storage candidate processes and is a candidate for extended interim fuel storage until policy questions regarding reprocessing and ultimate disposal have been resolved.

This report assesses the current performance of nuclear fuel in pool storage, the range of storage conditions, and the prospects for extending residence times. The assessment is based on visits to five U.S. and Canadian fuel storage sites, representing nine storage pools, and on discussions with operators of an additional 21 storage pools. Spent fuel storage experience from British pools at Winfrith and Windscale and from a German pool at Karlsruhe (WAK) also is summarized.

At the end of 1976 there were ~8700 power reactor fuel bundles in storage in U.S. pools. Approximately 90% of the bundles have Zircaloy cladding; the remainder have stainless steel cladding. Approximately 70,000 Zircaloy-clad bundles (~50 cm long) were stored in Canadian pools at the end of 1976.

Maximum pool residence for Canadian fuel is 14 years. Zircaloy-clad U.S. fuel has been in pool storage up to 18 years. Experimental stainless-clad fuel has been stored up to 12 years; commercial stainless-clad fuel has been stored up to 7 years; unirradiated stainless steel fixtures have been exposed in pools up to ~20 years without evidence of degradation. Maximum burnups for stored commercial fuel are ~33,000 MWd/MTU for both Zircaloy- and stainless-clad fuel.

Perceptions regarding the status of the stored spent fuel are based principally on visual observations during fuel handling operations and on visible portions of the bundles during storage. Radiation monitoring of water and air in pool storage areas also is conducted to detect evidence of radiation releases from the stored fuel.

The results of the survey indicate that pool operators have not seen evidence that stainless- or Zircaloy-clad uranium oxide fuel is degrading during pool storage, based on visual examinations and radiation monitoring.

Irradiated Canadian Zircaloy-clad fuel was returned to a reactor after up to 10 years of pool storage, with satisfactory performance. Shippingport fuel was removed from pool storage to a hot cell inspection in air after 4 years in pool storage. There was no visual evidence of degradation and no radiation releases occurred.

Mechanical damage to spent fuel during reactor discharge and fuel handling in the pools is minimal. The number of incidents where fuel was dropped during fuel handling operations appears to have been less than a dozen cases in 1974 to 1976. Only two cases were identified where fuel damage resulted in breached cladding.

Several hundred fuel bundles having rods which developed cladding defects during reactor exposures are in pool storage. Radioactive gases were expelled to the reactor coolant and therefore are not released from the reactor-induced cladding defects during pool storage. However, non-gaseous fission products are released to the pool water. Steady-state radioactivity concentrations in pool water can be maintained in the range 10^{-3} to 10^{-4} μCi/ml with ion exchange and filtration. Higher values (up to $\sim$0.5 μCi/ml) occur during fuel discharges at reactor pools. Spent fuel with defective cladding has been stored, shipped and reprocessed, frequently on the same basis as intact fuel.

The range of storage conditions in fuel pools is outlined below:

- <u>Water Chemistries</u>

  BWR and ISFSI[a] pools:

  Oxygen-saturated deionized water

  PWR pools:

  Oxygen-saturated deionized water + $\sim$2000 ppm boron as boric acid

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[a] Independent Spent Fuel Storage Installation; the only U.S. ISFSI pools which now store spent fuel are GE-Morris and Nuclear Fuel Services.

70 to 120°F (20 to 50°C). bulk water temperatures

Pools with adequate heat exchanger capacity maintain temperatures below 100°F, even with freshly-discharged fuel; clad temperatures for freshly-discharged fuel are ~18°F (10°C) above the bulk water temperatures. Mild temperature transients, within the range cited above, have occurred in pools during temporary shutdown of heat exchangers.

- Materials

Pool walls--painted concrete, stainless steel, fiberglass

Fuel canisters and racks--stainless steel or aluminum alloys

Grapples and hoists--stainless- or chromium-plated steel

Detailed, systematic examinations of fuel bundle materials have not been conducted specifically to define storage behavior, because of the expectation that the fuel would be reprocessed after relatively short pool residence. Also, there is minimal reason to expect that the corrosion-resistant fuel bundle materials would degrade in the relatively benign storage environments over the expected storage period. Over the range of pool storage experience cited above, there have been no observations which raise concerns. However, it is not now clear how long pool storage of spent fuel may be extended. If storage times of the spent fuel inventory are expected to extend into the 20-to-100-year time frame, there is an increasing incentive to determine whether any slow degradation mechanisms are operative.

Further assurances regarding fuel cladding integrity can be based on selected destructive exams of spent fuel having a previous exam history, which defined the results of the reactor exposure. Also, periodic visual and non-destructive surveillance of selected stainless- and Zircaloy-clad bundles can provide a systematic, sustained approach to verify the integrity of the spent fuel inventory. Such an approach, of limited scope, has in fact begun in Germany (Karlsruhe). The inspections also should include fuel having reactor-induced defects. Unless evidence of degradation develops in exploratory investigations, a surveillance program involving large numbers of bundles is not justified.

To define certain aspects of long-term (20-to-100-year) spent fuel and pool equipment integrity, some laboratory investigations may be useful. Any detailed fuel investigations and laboratory studies should consider the action of possible degradation mechanisms on either interior or exterior cladding surfaces and on lifting members such as fuel bundle bails. Cladding stresses are not expected to be high, but whether they are sufficient to participate in certain slow degradation mechanisms is not clear. Pitting or other localized corrosion, particularly of stainless steel, cannot be ruled out by present levels of inspection, again in regard to very long exposures.

Based on current experience and on an assessment of the relevant literature, prospects are favorable to extend storage of spent nuclear fuel in water pools, recognizing the following considerations:

- Zircaloy-clad fuel has been stored satisfactorily in pools up to 18 years; stainless-clad fuel has been stored up to 12 years.
- Low temperatures and favorable water chemistries are not likely to promote cladding degradation.
- There are no obvious degradation mechanisms which operate on the cladding under pool storage conditions at rates which are likely to cause failures in the time frame of probable storage.

Recommendations

- There is sufficient evidence of satisfactory integrity of pool-stored fuel to warrant extending fuel storage times and expanding fuel storage capacities.
- Exploratory examination of selected pool-stored fuel is warranted, particularly if the stored fuel inventory is expected to move into the 20-to-100-year time frame, to define whether slow degradation of the fuel bundle materials is operative. To be effective, the examinations must involve bundles having previous destructive examinations which define the effects of the reactor exposure, followed by substantial pool exposures. Periodic visual and non-destructive surveillance of selected bundles can provide further assurance of sustained fuel bundle integrity.

State of New Jersey)
: SS.
County of Essex

AFFIDAVIT OF ROBERT L. MITTL

ROBERT L. MITTL, being first duly sworn according to law, deposes and states:

1. I am General Manager - Licensing and Environment of Licensee, Public Service Electric and Gas Company. In that capacity, I am familiar with the design and construction of the Salem Nuclear Generating Station and Hope Creek Generating Station.

2. PSE&G plans to increase the spent fuel capacity of Salem Unit 2 to 1170 elements by making essentially the same modifications as for Unit 1.

3. With regard to the Hope Creek Generating Station, because of the projected operating dates, the Company has not yet decided on the ultimate number of spent fuel elements to be stored in each pool. At this time, however, the Company is considering the storage capability for 1.6 cores. As presently contemplated, the design would be such that additional racks could be added should that become necessary.

4. PSE&G has applied to the NRC to amend its license for Salem Unit 1 to increase the storage of spent fuel resulting from the operation of that unit. The additional capacity of the new racks was based upon the needs of that unit and the size of the existing fuel pool. It provides for 15 annual discharges while maintaining the capability for a full core discharge.

5. PSE&G has never considered nor has it any plans to utilize the spent fuel storage capacity of the Salem Generating Station for storage of any other facilities' fuel.

Robert L. Mittl

ROBERT L. MITTL

Sworn and subscribed to)
before me this [illegible] day)
of February, 1979.)

BARBARA VALLEE
A NOTARY PUBLIC OF NEW JERSEY
My Commission Expires Nov. 8, [illegible]

Before the Atomic Safety and Licensing Board

In the Matter of PUBLIC SERVICE ELECTRIC AND GAS COMPANY, et al. (Salem Nuclear Generating Station, Unit 1)	)))))))	Docket No. 50-272

CERTIFICATE OF SERVICE

I hereby certify that copies of the following documents:

1. "Licensee's Motion For Summary Disposition"
2. "Licensee's Statement Of Material Facts As To Which There Is No Genuine Issue To Be Heard"
3. "Licensee's Memorandum In Support Of Its Motion For Summary Disposition"

all dated February 27, 1979, in the captioned matter, have been served upon the following by deposit in the United States mail this 27th day of February, 1979:

Gary L. Milhollin, Esq.
Chairman, Atomic Safety and Licensing Board
1815 Jefferson Street
Madison, Wisconsin 53711

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

Dr. James C. Lamb, III
Member, Atomic Safety and Licensing Board Panel
313 Woodhaven Road
Chapel Hill, N.C. 27514

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

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

Barry Smith, Esq.
Office of the Executive Legal Director
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mark L. First, Esq.
Deputy Attorney General
Department of Law and Public Safety
Environmental Protection Section
36 West State Street
Trenton, N.J. 08625

Richard Fryling, Jr., Esq.
Assiscant General Solicitor
Public Service Electric
& Gas Company
80 Park Place
Newark, N. J. 07101

R. William Potter, Esq.
Assistant Deputy Public Advocate
Department of the Public Advocate
Division of Public Interest
Advocacy
Post Office Box 141
Trenton, N. J. 08601

Sandra T. Ayres, Esq.
Department of the Public Advocate
520 East State Street
Trenton, N. J. 08625

Mr. Alfred C. Coleman, Jr.
Mrs. Eleanor G. Coleman
35 "K" Drive
Pennsville, New Jersey 08070

Carl Valore, Jr., Esq.
Valore, McAllister, Aron
& Westmoreland
Mainland Professional Plaza
P. O. Box 175
Northfield, N. J. 08225

Office of the Secretary
Docketing and Service Section
U.S. Nuclear Regulatory
Commission
Washington, D. C. 20555

June D. MacArtor, Esq.
Deputy Attorney General
Tatnall Building, P. O. Box 1401
Dover, Delaware 19901

Mark J. Wetterhahn