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Docket Nos. 50-277
and 50-278

NOVEMBER 30 1978

Mr. Edward G. Bauer, Jr., Esquire
Vice President and General Counsel
Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Dear Mr. Bauer:

The Commission has issued the enclosed Amendments Nos. and to Facility Operating Licenses Nos. DPR-44 and DPR-56 for the Peach Bottom Atomic Power Station Units Nos. 2 and 3. The amendments revise the Technical Specifications in response to your requests of January 18, April 12, May 19, June 12, and September 19, 1978.

These amendments revise the Technical Specifications to increase the total storage capacity of the spent fuel pools at Peach Bottom Atomic Power Station Units Nos. 2 and 3 from 2220 to 5632 fuel assemblies.

Copies of the related Safety Evaluation, Environmental Impact Appraisal and Notice of Issuance and Negative Declaration are also enclosed.

Sincerely,

Original signed by
Thomas A. Ippolito, Chief
Operating Reactors Branch #3
Division of Operating Reactors

ccp

7812180104

Enclosures:
1. Amendment No. 49 to DPR-44
2. Amendment No. 48 to DPR-56
3. Safety Evaluation
4. Environmental Impact Appraisal
5. Notice

CP-1

cc w/enclosures: See next page

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NRC FORM 318 (9-76) NRCM 0240

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

PHILADELPHIA ELECTRIC COMPANY
PUBLIC SERVICE ELECTRIC AND GAS COMPANY
DELMARVA POWER AND LIGHT COMPANY
ATLANTIC CITY ELECTRIC COMPANY

DOCKET NO. 50-277

PEACH BOTTOM ATOMIC POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 49
License No. DPR-44

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The applications for amendment by Philadelphia Electric Company, et al, (the licensee) dated January 18, April 12, May 19, June 12, and September 19, 1978, comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C(2) of Facility Operating License No. DPR-44 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 49, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Brian Grimes

Brian K. Grimes, Assistant Director
for Engineering and Projects
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: November 30, 1978

ATTACHMENT TO LICENSE AMENDMENT NO. 49

FACILITY OPERATING LICENSE NO. DPR-44

DOCKET NO. 50-277

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change.

Remove	Insert
ii	ii
228	228
241	241

TABLE OF CONTENTS (Cont'd.)

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS

3.10.B (Cont'd.)

1. The SRM shall be inserted to the normal operating level. (Use of special moveable, dunking type detectors during initial fuel loading and major core alterations in place of normal detectors is permissible as long as the detector is connected to the normal SRM circuit.)

2. The SRM shall have a minimum of 3 cps with all rods fully inserted in the core.

C. Spent Fuel Pool Water Level

Whenever irradiated fuel is stored in the spent fuel pool, the pool water level shall be maintained at or above 8 1/2' above the top of the fuel.

D. Heavy Loads Over Spent Fuel

Loads in excess of 1000 lbs (excluding the rigging and transport vehicle) shall be prohibited from travel over fuel assemblies in the spent fuel storage pool.

E. Spent Fuel Decay Time

The reactor shall be subcritical for at least 120 hours prior to movement of fuel elements from the reactor vessel to the spent fuel pool.

4.10.B (Cont'd.)

C. Spent Fuel Pool Water Level

Whenever irradiated fuel is stored in the spent fuel pool, the water level shall be recorded daily.

E. Spent Fuel Decay Time

The reactor shall be determined to have been subcritical for at least 120 hours by verification of the date and time of subcriticality prior to movement of irradiated fuel from the reactor vessel to the spent fuel pool.

5.0 MAJOR DESIGN FEATURES

5.1 SITE FEATURES

The site is located partly in Peach Bottom Township, York County, partly in Drumore Township, Lancaster County, and partly in Fulton Township, Lancaster County, in southeastern Pennsylvania on the westerly shore of Conowingo Pond at the mouth of Rock Run Creek. It is about 38 miles north-northeast of Baltimore, Maryland, and 63 miles west-southwest of Philadelphia, Pennsylvania. Figures 2.2.1 through 2.2.4 of the FSAR show the site location with respect to surrounding communities.

5.2 REACTOR

A. The core shall consist of not more than 764 fuel assemblies. 7 x 7 fuel assemblies shall contain 49 fuel rods and 8 x 8 fuel assemblies shall contain 62 or 63 fuel rods.

B. The reactor core shall contain 185 cruciform-shaped control rods. The control material shall be boron carbide powder (B_4C) compacted to approximately 70% of the theoretical density.

5.3 REACTOR VESSEL

The reactor vessel shall be as described in Table 4.2.2 of the FSAR. The applicable design codes shall be as described in Table 4.2.1 of the FSAR.

5.4 CONTAINMENT

A. The principal design parameters for the primary containment shall be as given in Table 5.2.1 of the FSAR. The applicable design codes shall be as described in Appendix M of the FSAR.

B. The secondary containment shall be as described in Section 5.3 of the FSAR.

C. Penetrations to the primary containment and piping passing through such penetrations shall be designed in accordance with standards set forth in Section 5.2.3.4 of the FSAR.

5.5 FUEL STORAGE

A. The new fuel storage facility shall be such that the K_{eff} dry is less than 0.90 and flooded is less than 0.95.

B. The K_{eff} of the spent fuel storage pool shall be less than or equal to 0.95.

C. Spent fuel shall only be stored in the spent fuel pool in a vertical orientation in approved storage racks.

D. The average fuel assembly loading shall not exceed 17.3 grams U-235 per axial centimeter of total active fuel height of the assembly.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

PHILADELPHIA ELECTRIC COMPANY
PUBLIC SERVICE ELECTRIC AND GAS COMPANY
DELMARVA POWER AND LIGHT COMPANY
ATLANTIC CITY ELECTRIC COMPANY

DOCKET NO. 50-278

PEACH BOTTOM ATOMIC POWER STATION, UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 48
License No. DPR-56

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The applications for amendment by Philadelphia Electric Company, et al, (the licensee) dated January 18, April 12, May 19, June 12, and September 19, 1978, comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C(2) of Facility Operating License No. DPR-56 is hereby amended to read as follows:

   (2) <u>Technical Specifications</u>

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 48, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Brian Grimes

Brian K. Grimes, Assistant Director
for Engineering and Projects
Division of Operating Reactors

Attachment:
Changes to the Technical Specifications

Date of Issuance: November 30, 1978

ATTACHMENT TO LICENSE AMENDMENT NO. 48

FACILITY OPERATING LICENSE NO. DPR-56

DOCKET NO. 50-278

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change.

Remove	Insert
ii	ii
228	228
242	242

TABLE OF CONTENTS (Cont'd.)

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.10.B (Cont'd.)	4.10.B (Cont'd.)
1. The SRM shall be inserted to the normal operating level. (Use of special moveable, dunking type detectors during initial fuel loading and major core alterations in place of normal detectors is permissible as long as the detector is connected to the normal SRM circuit.)	
2. The SRM shall have a minimum of 3 cps with all rods fully inserted in the core.	
C. Spent Fuel Pool Water Level	C. Spent Fuel Pool Water Level
Whenever irradiated fuel is stored in the spent fuel pool, the pool water level shall be maintained at or above 8 1/2' above the top of the fuel.	Whenever irradiated fuel is stored in the spent fuel pool, the water level shall be recorded daily.
D. Heavy Loads Over Spent Fuel	
Loads in excess of 1000 lbs (excluding the rigging and transport vehicle) shall be prohibited from travel over fuel assemblies in the spent fuel storage pool.	
E. Spent Fuel Decay Time	E. Spent Fuel Decay Time
The reactor shall be subcritical for at least 120 hours prior to movement of fuel elements from the reactor vessel to the spent fuel pool.	The reactor shall be determined to have been subcritical for at least 120 hours by verification of the date and time of subcriticality prior to movement of irradiated fuel from the reactor vessel to the spent fuel pool.

5.5 FUEL STORAGE

A. The new fuel storage facility shall be such that the K_{eff} dry is less than 0.90 and flooded is less than 0.95.

B. The K_{eff} of the spent fuel storage pool shall be less than or equal to 0.95.

C. Spent fuel shall only be stored in the spent fuel pool in a vertical orientation in approved storage racks.

D. The average fuel assembly loading shall not exceed 17.3 grams U-235 per axial centimeter of total active fuel height of the assembly.

5.6 SEISMIC DESIGN

The station Class I structures and systems have been designed for ground accelerations of 0.05g (design earthquake) and 0.12g (maximum credible earthquake).

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NOS. 49 AND 48 TO FACILITY LICENSE NOS. DPR-44 AND DPR-56

PHILADELPHIA ELECTRIC COMPANY
PUBLIC SERVICE ELECTRIC AND GAS COMPANY
DELMARVA POWER AND LIGHT COMPANY
ATLANTIC CITY ELECTRIC COMPANY

PEACH BOTTOM ATOMIC POWER STATION UNITS NOS. 2 AND 3

DOCKETS NOS. 50-277 AND 50-278

1.0 Introduction

By letters dated January 18, April 12, May 19, June 12, and September 19, 1978, the Philadelphia Electric Company (PECO) proposed to change the spent fuel pool (SFP) storage design for Peach Bottom Atomic Power Station, Units 2 and 3, from the design which was reviewed and approved in the operating license review and described in the FSAR. The proposed change consists of increasing the existing spent fuel storage capacity for both units from 2220 fuel assemblies to 5632 fuel assemblies. This licensing action was noticed in the FEDERAL REGISTER on February 23, 1978 (43FR7490).

2.0 Discussion

The licensee proposed to replace the existing spent fuel pool storage racks in Peach Bottom Unit Nos. 2 and 3 with high density racks. The licensee plans to initially procure sufficient racks to expand the capacity from 1110 fuel assemblies to 2608 assemblies per pool. However, to provide for further expansion, if necessary, the licensee has provided information and analysis based on an assumed assembly capacity of 2816 per pool. The licensee does not propose any modification to the SFP structure or its cooling system.

The proposed spent fuel storage racks will consist of alternating, double-walled aluminum containers. Each will be approximately 14 feet long and will have a square cross section with an inner dimension of 6.44 inches. The nominal pitch between fuel assemblies is 7.0 inches. This results in an overall fuel region volume fraction of 0.53 in the nominal storage lattice cell. A Boral plate is to be seal welded in the cavity between the double walls. Thus, in this arrangement there will be only one Boral plate between adjacent fuel assemblies. In its January 18, 1978 submittal, PECO states that the minimum amount of boron-10 per unit area of Boral plate will be 0.0232 grams per square centimeter. This is equivalent to 1.4×10^{21} boron-10 atoms per square centimeter.

3. Evaluation

3.1 Criticality Analyses

As stated in PECO's January 18, 1978 submittal, the fuel pool criticality calculations are based on an unirradiated BWR fuel assembly with no burnable poison and a fuel loading of 17.3 grams of uranium-235 per axial centimeter of fuel assembly.

The Nuclear Associates International Corporation (NAI) performed the criticality analyses for PECO. NAI made parametric calculations by using the CHEETAH-B computer program to obtain four-group cross sections for PDQ-7 diffusion theory calculations. The effective boron cross sections for the Boral plates were calculated with the CORC-Blade program. NAI stated that these programs have been extensively tested by using them to make benchmark experiment calculations and core physics calculations for several existing operating power reactors.

These computer programs were used to calculate the neutron multiplication factor for an infinite array of fuel assemblies in the nominal storage lattice at 20°C with the minimum boron concentration in the Boral, i.e., 0.0232 grams of boron-10 per square centimeter. NAI then performed calculations to determine: (1) the highest neutron multiplication factor as a function of pool water temperature; (2) the effect of a possible reduction in the lattice pitch; and (3) the effect of eccentrically positioning fuel assemblies in the storage lattice. In its January 18, 1978 submittal, PECO states that the calculations showed that when all of these effects are accounted for, the maximum effective neutron multiplication factor (K_{eff}) in the fuel pool will be less than 0.91. The accuracy of the diffusion theory method for this storage rack application was then checked by calculating the nominal reference case with the KENO-IV Monte Carlo program using 123 group cross sections from the GAM-THERMOS library, and it was found that the results of the diffusion theory method agree within one percent Δk.

These storage racks are designed to prohibit the insertion of a fuel assembly anywhere except in prescribed locations. However, it will be possible to place a fuel assembly between the outer periphery of the storage racks and the fuel pool walls. In its January 18, 1978 submittal PECO states that this situation was analyzed by assuming that a fuel assembly is lodged parallel to an assembly in an outer cavity with no Boral sheet separating the two parallel assemblies. PECO found, based on a conservative analysis, that the increase in the K_{eff} will be less than 0.5% Δk.

In response to our request for additional information, PECO stated in its April 12, and September 19, 1978 submittals that a neutron source and detector will be used on site to verify the presence of all the Boral plates in the racks. The staff concludes that the combination of quality control measures at the Boral fabricator, the rack fabricator's testing and the on-site verification are adequate to verify that the Boral plates are installed to maintain $k_{eff} \leq 0.95$.

The above described results compare favorably with the results of parametric calculations made with other methods for similar fuel pool storage lattices. By assuming new, unirradiated fuel with no burnable poison or control rods, these calculations yield the maximum neutron multiplication factor that could be obtained throughout the life of the fuel assemblies. This includes the effect of the plutonium which is generated during the fuel cycle.

We find that all factors that could affect the neutron multiplication factor in this pool have been conservatively accounted for and that the maximum neutron multiplication factor in this pool with the proposed racks will not exceed 0.95. This is NRC's acceptance criterion for the maximum (worst case) calculated neutron multiplication factor in a spent fuel pool. This 0.95 acceptance criterion is based on the uncertainties associated with the calculational methods and provides sufficient margins to preclude criticality in the fuel. Accordingly, as proposed by PECO, we have included in the amendment a Technical Specification which limits the effective neutron multiplication factor in the spent fuel pools to 0.95.

We find that when any number of the fuel assemblies which PECO described in these submittals, which have no more than 17.3 grams of uranium-235 per axial centimeter of fuel assembly, are loaded into the proposed racks, the neutron multiplication factor will be less than 0.95. On this basis, we conclude that by prohibiting the storage of fuel assemblies that contain more than 17.3 grams of uranium-235 per axial centimeter of fuel assembly, there is reasonable assurance that the health and safety of the public will not be endangered by the use of the proposed racks.

3.2 Spent Fuel Cooling

The licensed thermal power for each of the two Peach Bottom reactors is 3293MWT. PECO plans to refuel these plants on an 18 month cycle. This will require the replacement of about 270 of the 764 fuel assemblies in each core every 18 months. In its January 18, 1978 submittal, PECO states that there will be a cooling time of 120 hours prior to unloading the first spent fuel assembly into the fuel pool; and after these 120 hours, the spent fuel assemblies will be unloaded into the pool at a rate of one hundred assemblies per day. PECO assumed a burnup of 40,000 MWD/MTU for a normal refueling batch of spent fuel and an average burnup of 30,000 MWD/MTU for a full core discharge. For these cooling times and fuel burnups PECO calculated the maximum heat load in the spent fuel pool to be 15.7×10^6 BTU/hr for the final 18 month refueling which fills the pool, and 32.3×10^6 BTU/hr for a full core offload which fills the pool after eleven annual refuelings.

The spent fuel pool cooling system consists of three pumps and three heat exchangers in parallel for each unit. Each pump is designed to pump 533 gpm [2.67×10^5 pounds per hour]. Each heat exchanger is designed to transfer 3.75×10^6 BTU/hr from 115°F fuel pool water to 90°F service water which is flowing through the heat exchanger at a rate of 4.0×10^5 pounds per hour.

PECO stated that when a full core is offloaded into the spent fuel pool, the Residual Heat Removal (RHR) system will be used to maintain the fuel pool water temperature below 150°F.

In its April 12, 1978 submittal, PECO stated that in addition to the normal makeup water capability for the spent fuel pool from the condensate storage tank, there are four other sources of demineralized water and two sources of river water available for restoring water to the spent fuel pool.

We find that PECO's calculated peak heat loads for the modified pool with a storage capacity for 2816 fuel assemblies are conservative and acceptable. We also find that the maximum incremental heat load that will be added by increasing the number of spent fuel assemblies that are to be stored in each of these pools from 1110 to 2816 will be 1.7×10^6 BTU/$_{hr}$. This is the difference in peak heat loads for full core offloads that essentially fill the present and the modified pools.

PECO's calculated fuel pool outlet water temperatures are consistent with the stated cooling water flow rates and the design of the heat exchangers. We calculate that with all three spent fuel cooling pumps and heat exchangers operating at design capacity with PECO's peak heat load for any refueling [i.e., 15.7×10^6 BTU/$_{hr}$] the maximum spent fuel pool outlet water temperature will be approximately 125°F. The 70×10^6 BTU/$_{hr}$ capacity of the four Residual Heat Removal Heat exchangers is more than adequate to remove the maximum full core heat load of 32.2×10^6 BTU/$_{hr}$ and still maintain the spent fuel pool outlet water temperature below the 150°F design limit.

Assuming a maximum fuel pool temperature of 150°F, the minimum possible time to achieve bulk pool boiling after any credible accident will be about six hours. After bulk boiling commences, the maximum evaporation rate will be 66 gpm. We find that six hours would be sufficient time for PECO to establish a 66 gpm makeup rate. We also find that under bulk boiling conditions the temperature of the fuel will not exceed 350°F. This is an acceptable temperature from the standpoint of fuel element integrity and surface corrosion.

We find that the present cooling capacities in the spent fuel pools of the Peach Bottom Atomic Power Station, Units 2 and 3 will be sufficient to handle the incremental load that will be added by the proposed modifications. We also find that this incremental heat load will not alter the safety considerations of spent fuel pool cooling from that which we previously reviewed and found to be acceptable. The spent fuel cooling system satisfies the Staff's requirements set forth in Regulatory Position C6 of Regulatory Guide 1.13 in that failure or maloperation will not cause the fuel to be uncovered. To assure that our conservative evaluation remains valid, the Technical Specifications have been amended to require a minimum of 120 hours cooling time prior to placing a spent fuel assembly in the storage pool.

3.3 Installation of Racks

In response to our request for additional information, PECO stated in its April 12, 1978 and May 19, 1978 submittals that the following measures in conjunction with the use of the 125 ton reactor building crane should preclude the dropping of a storage rack during their removal and installation:

1) The lifting fixture is designed with a minimum 3:1 factor of safety on yield.

2) The lifting fixture will be proof-loaded to 125% of the rated load prior to the lifting of any racks.

3) The lifting fixture is designed so that failure of the hydraulic system used to operate the fixture will not cause rack release.

4) Visual confirmation of lifting fixture dog engagement into the rack will be made prior to each use.

5) The heaviest rack that is to be moved will weigh 16,300 pounds.

In its January 18, 1978 submittal, PECO states that the handling of all materials entering or leaving the spent fuel pools will be scheduled and controlled to preclude movement over racks which contain spent fuel assemblies. This will be done by moving the spent fuel assemblies, which are in the pool, to that half of the pool which is not going to be modified at that time.

We find that the safety measures described by PECO in its submittals dealing with the removal and installation of the spent fuel storage racks in the Peach Bottom Atomic Power Station, Units 2 and 3 are adequate and acceptable. We conclude that there is reasonable assurance that the health and safety of the public will not be endangered by the installation and use of the proposed racks.

3.4 Fuel Handling

The NRC staff has under way a generic review of load handling operations in the vicinity of spent fuel pools to determine the likelihood of a heavy load impacting fuel in the pool and, if necessary, the radiological consequences of such an event. In view of this ongoing review, Peach Bottom will be required by Technical Specification to prohibit the movement of loads greater than the approximate weight of a fuel assembly over spent fuel in the SFP. This is consistent with the acceptance criteria set forth in reference 1. We have concluded that the likelihood of a heavy load handling accident is sufficiently small that the proposed modification is acceptable and no additional restrictions on load handling operations in the vicinity of the SFP are necessary while our review is under way.

The consequences of fuel handling accidents in the spent fuel pool area are not changed from those presented in the Safety Evaluation (SE) dated August 1972.

3.5 Structural and Mechanical Design

The proposed spent fuel pool storage racks are a bolted anodized aluminum construction. They consist of the following basic components: top grid castings, bottom grid casting, poison can assembly, side plates, corner angle clips, adjustable foot assembly, and bolts, dowel pins and rivets. Each component is anodized separately. The top and bottom grids maintain nominal fuel element spacing of 7 inches center to center within the rack. The grid structures are bolted and riveted together by four corner angles and four side shear panels. Large leveling screws are located at the rack corner to adjust for variations in pool floor level. Stainless steel bearing pads are installed at the bottom of the screw's pivot to allow for maintaining a flat uniform contact area. The closely spaced arrangement of the storage racks is such that no structural loads will be imposed on the poison cans.

Pockets are cast in alternate cavity openings of the grids into which poison cans rest. A poison can consists of two concentric square aluminum tubes. Sealed within these tubes are Boral (B_4C) poison plates. Each poison can is capable of containing one fuel assembly. The outer can is formed into the inner can at the ends and totally seal welded to isolate the Boral from the pool water. Each can is pressure and vacuum leak tested. The design of the racks is such that no structural loads will be imposed on the poison cans.

The racks are a free standing design with no connections between racks and no lateral restraints to the pool walls. The only interface with the floor are the four stainless bearing pads attached to the corner leveling screws. These pads do not provide vertical support against upward movement. Lateral loads are transferred in shear developed by friction between the pads and the pool floor. A 1/4 inch ABS plastic sheet separates the stainless steel pad and aluminum leveling screw to prevent galvanic corrosion. The ABS plastic sheet is held in place by the geometric configuration of the adjustable foot.

The design, fabrication, and installation procedures; the structural design and analyses procedures for all loadings, including seismic and impact loading; the load combinations and structural acceptance criteria; the quality control for the design, fabrication, and installation; and the applicable industry codes were all reviewed in accordance with the Branch Technical Position (BTP) entitled "Review and Acceptance of Spent Fuel Storage and Handling Applications" (Ref. 1).

Our review of the licensee's submittal indicates that the loads, loading combinations, and acceptance criteria are in accordance with Section 3.8.4 of the Standard Review Plan (SRP). The allowable stresses for stainless steel are in accordance with Appendix XVII and Appendix I Section III of the ASME B&PV Code 2. Since the SRP does not specifically reference allowable stresses for aluminum members, our acceptance criteria is based on the "Aluminum Construction Manual, Section I, Specifications for Aluminum Association." Use of this latter code provides the same degree of specificity as the ASME Code.

The seismic analysis performed was a combination time history/static analysis utilizing the computer programs ANSYS and SAPIV. For the simplified dynamic model used in the ANSYS analysis, the rack structure is idealized as a planar frame. Fundamental frequencies of this linear system were calculated and agreed closely with the more detailed SAPIV model. Non-linear effects due to rocking and sliding of the racks, and movement of the fuel within the racks are considered by expanding the ANSYS model. In this model all fuel assemblies are assumed to move in phase in order to arrive at maximum impact forces. In addition a two rack model is also analyzed in order to compute the maximum potential for interaction or contacting with other racks in the pool.

Simultaneous horizontal and vertical time histories are used as input. These generated time histories correspond to plus or minus 15% broadened equipment spectra at the spent fuel pool floor elevation. The mass of the water within the racks is added to the mass of the racks for calculations in the horizontal direction, but not for calculation in the vertical direction. The structural damping used is consistent with values documented in the Peach Bottom FSAR, Appendix C for in-air bolted structures. No increase in damping was attributed due to the pool water.

The coefficients of friction values between the stainless steel feet and liner are based on the following test reports: "Simulated Rack Minimum Coefficient of Friction" by PaR and "Friction Coefficients of Water-Lubricated Stainless Steels for a Spent Fuel Rack Facility" by Professor Ernest Rabinowicz of MIT.

Results from the time history analysis were applied to the more detailed SARIV static model. This model consisted of over 400 flexural beam column elements and over 800 plate elements.

Our review of the licensee's submittal indicates that the results of the seismic analyses show that the racks are capable of withstanding the loads associated with all the design loading conditions without exceeding allowable stresses. Interface loads transmitted to the fuel pool floor due to rocking are within the load carrying capability of the floor and rack legs. The maximum calculated sliding of 1.32 inches shows that the racks will not impact the pool walls, existing swing bolts on the pool floor, or other structures present at any time during replacement. Rack to rack impact loadings result in acceptable stress levels. Also, fuel rattling results in no damage to the racks or fuel assemblies themselves. Calculations show that the plastic will remain within its elastic limits and will withstand the design loadings.

The racks have been designed to withstand the local as well as gross effects of a dropped fuel assembly. The following drop conditions were examined: 18" fuel drop on the corner of the top grid castings and fuel rollover, 18" drop in the middle of the top castings, and a fuel drop full length through the cavity impacting on the bottom grid. The impact loads applied in the first two cases have been verified by full-size tests on an actual top grid casting. For the last case the bottom fuel support shears out and the fuel bundle impacts the pool floor liner plate. Results of these analyses show that applicable stress allowables are satisfied and no adverse effects on the racks or pool floor result.

The effects from a postulated stuck fuel assembly have been examined. A maximum uplift load of 4000 lbs. (capacity of the crane) results in stresses below those allowed for the applicable loading combination.

Because of the increased loading imparted to pool structure resulting from this increase in storage capacity, a structural analysis was made to establish the maximum load carrying capacity of the existing spent fuel pool. Forces transmitted by the model interface elements, which represent the rack legs, were computed for each time step of the analysis. These loads were used to determine the bearing and punching shear stress in the reinforced concrete floor.

The allowable stresses were taken from Section 8.10, Alternative Design Method, of American Concrete Institute (ACI 318-71). Results of the analysis show that for the critical loading conditions, the calculated loads are below code allowables, demonstrating that the racks were designed to preclude shear failures in the SFP floor.

Since the possibility of long term storage of spent fuel exists, the effects of the pool environment on the racks and fuel cladding must be examined. The pool water is unborated and constantly being purified. The new racks are anodized and, therefore, have greater resistance to corrosion. It is highly unlikely that the racks or fuel cladding will incur any corrosion problems during the life of the plant. No corrosion of the plastic, used to eliminate possible galvanic effects, is expected. Also, corrosion of the Boral will not be a problem since the material is sealed within the poison cans and vacuum and pressure tests performed to verify leak-tightness. Even in the event a leak developed a 40 year life would be expected for the Boral with no reduction in neutron absorbing capability. This is based on the licensee's letter dated May 19, 1978 which states that recent tests by the Boral Manufacturers have shown Boral to undergo no reduction in neutron capability due to corrosion for at least 53 and probably more than 60 years following the rupture of the poison can.

Based on the above, we find that the new proposed spent fuel storage racks and the design and analyses performed for the racks and pool are in conformance with established criteria, codes and standards specified in the staff position for acceptance of spent fuel storage and handling applications (Ref. 1).

We find that the subject modification proposed by the licensee is acceptable and satisfies the applicable requirements of General Design Criteria 2, 4, 61 and 62 of Appendix A to 10 CFR 50.

3.6 Occupational Radiation Exposure

We have reviewed the licensee's plan for the removal, crating and disposal of the low density racks and the two step installation of the high density racks for each unit (i.e., installing 26 racks in 1978 and 3 in the 1980's) with respect to occupational radiation exposure. The occupational radiation exposure for both operations is estimated by the licensee to be about 20 man-rem for each unit. We consider this to be a conservative estimate based on relevant experience for this type operation. This operation represents a small fraction of the total man-rem burden from occupational exposure at the plant. We conclude the exposures will be as low as is reasonably achievable since the facility design and procedures take into account state of technology and further reduction of occupational exposure is not practical.

Installing the new high density racks in both pools in two steps instead of completing the modification in a single step is acceptable because the occupational exposure for either method of installation should be approximately the same. The present pools are each contaminated from two refuelings. The proposed modification is not expected to significantly increase the pool water activity and resulting radiation levels in the vicinity of the pool. Divers will not be needed during the installation of the last three racks. Therefore, the occupational exposure for installing the new racks in two steps will be approximately the same as for installing these racks in a single step.

We have estimated the increment in onsite occupational dose resulting from the proposed increase in stored fuel assemblies on the basis of information supplied by the licensee and by utilizing relevant assumptions for occupancy times and for dose rates in the spent fuel area from radionuclide concentrations in the SFP water. The spent fuel assemblies themselves contribute a negligible amount to dose rates in the pool area because of the depth of water shielding the fuel. The occupational radiation exposure resulting from the proposed action represents a negligible burden. Based on present and projected operations in the spent fuel pool area, we estimate that the proposed modification should add less than one percent to the total annual occupational radiation exposure burden at this facility. As discussed above, we conclude based on impracticality of reducing occupational exposures, that the small increase in radiation exposure will not affect the licensee's ability to maintain individual occupational doses to as low as is reasonably achievable and within the limits of 10 CFR 20. Thus, we conclude that storing additional fuel in the SFP will not result in any significant increase in doses received by occupational workers.

3.7 Radioactive Waste Treatment

The plant contains waste treatment systems designed to collect and process the gaseous, liquid and solid wastes that might contain radioactive material. The waste treatment systems were evaluated in the Safety Evaluation (SE) dated August 1972. There will be no change in the waste treatment systems or in the conclusions of the evaluation of these systems as described in Section 8.0 of the SE because of the proposed modification. Our evaluation of the amount of additional waste to be generated by the modification is discussed in Section 5.3 of the Environmental Impact Appraisal accompanying this amendment.

4.0 Technical Specification Changes

Each of the Technical Specification changes associated with this licensing action is discussed below:

a) As proposed by the licensee, the K_{eff} of the spent fuel pool has been changed from less than or equal to 0.90 to less than or equal to 0.95. The acceptability of this change is discussed in Section 3.1.

b) In order to insure that the K_{eff} of the stored fuel is less than or equal to 0.95 the staff has added a specification to limit the axial U-235 loading of a stored fuel assembly. This specification is discussed in Section 3.1.

c) To assure that the spent fuel cooling evaluation remains valid, the staff has added a specification to require at least 120 hours of cooling prior to transferring an element from the core to the spent fuel pool. This specification is discussed in Section 3.2.

d) In view of the ongoing review on heavy loads over spent fuel, the staff has added a specification to limit the weight of any load being transported over spent fuel. This specification is discussed in Section 3.4.

Items (b), (c) and (d) above were discussed with the licensee. He agrees with these additions.

5.0 Summary

Our evaluation supports the conclusion that the proposed modification to the Peach Bottom SFP is acceptable because:

(1) The physical design of the new storage racks will preclude criticality for any credible moderating condition with the limits to be stated in the Technical Specifications.

(2) The SFP cooling system has adequate cooling capacity.

(3) The installation and use of the proposed fuel handling racks can be accomplished safely with the limit that no rack modules will be moved over any spent fuel assemblies.

(4) The installation and use of the new fuel racks can be done safely and do not alter the consequences of the design basis accident for the SFP, i.e., the rupture of a fuel assembly and subsequent release of the assembly's radioactive inventory within the gap.

(5) The likelihood of an accident involving heavy loads in the vicinity of the spent fuel pool is sufficiently small that no additional restrictions on load movement are necessary while our generic review of the issues is under way.

(6) The structural design and the materials of construction are adequate to function normally for the duration of the plant lifetime and to withstand the seismic loading of the design basis earthquake.

(7) The increase in occupational radiation exposure to individuals due to the storage of additional fuel in the SFP would be negligible.

6.0 Conclusion

We have concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: November 30, 1978

Reference: NRC letter (Grimes) to All Power Reactor Licensees transmitting OT Position for Review and Acceptance of Spent Fuel Storage and Handling Applications, April 14, 1978.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

ENVIRONMENTAL IMPACT APPRAISAL BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NOS. 49 AND 48 TO FACILITY LICENSE NOS. DPR-44 AND DPR-56

PHILADELPHIA ELECTRIC COMPANY

PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3

DOCKET NOS. 50-277 AND 50-278

1.0 Description of Proposed Action

In their submittals of January 18, April 12, May 19, June 12 and September 19, 1978, Philadelphia Electric Company (the licensee) proposed to increase the total storage capacity of the spent fuel pools (SFP) at Peach Bottom Atomic Power Station, Units 2 and 3, from 2220 to 5632 fuel assemblies.

2.0 Need for Increased Storage Capacity

Peach Bottom Unit Nos. 2 and 3 are boiling water reactors, located at the licensee's site in York County, Pennsylvania and each has a design electrical rating of 1065 Net MWe. The units have been in commercial operation since July 5, 1974 (for Unit 2) and December 23, 1974 (for Unit 3). The reactor spent fuel storage pools currently contain fuel storage racks that can accommodate 1110 fuel assemblies at each Unit.

During a normal refueling approximately one-third to one-fourth of the fuel assemblies are replaced by new fuel. The period between refueling intervals normally varies between twelve and eighteen months depending on plant operating history and the system wide outage schedule. With the licensee's projected refueling cycles, the licensee projects that the fuel pools will be unable to accept full, refueling discharges by 1981 for Unit 2 and by 1982 for Unit 3. Neither Unit has the current capability to discharge the entire core that is presently in the reactor vessel. By adding an additional 1706 fuel storage positions in each pool, the modification will permit the offloading of the fuel cores through 1987 for Unit 2 and 1988 for Unit 3.

The proposed modifications to the SFP will not alter the external physical geometry or require modifications to the SFP cooling or purification system. The proposed modification does not affect the quantity of uranium fuel utilized in the reactor, the rate of spent fuel generation or the total quantity of spent fuel generated during the anticipated operating lifetime of the facility. The proposed modification will increase the number of spent fuel assemblies stored in the SFP, the length of time that the reactor can continue to operate without shipping spent fuel offsite, and the length of time that some of the fuel assemblies will be stored in the pool.

3.0 Fuel Reprocessing History

Currently, spent fuel is not being reprocessed on a commercial basis in the United States. The Nuclear Fuel Services (NFS) plant at West Valley, New York, was shut down in 1972 for alterations and expansions; on September 22, 1976, NFS informed the Commission that they were withdrawing from the nuclear fuel reprocessing business. The Allied General Nuclear Services (AGNS) proposed plant in Barnwell, South Carolina, is not licensed to operate.

The General Electric Company's (GE) Midwest Fuel Recovery Plant (MFRP) in Morris, Illinois is in a decommissioned condition. Although no plants are licensed for reprocessing fuel, the storage pool at Morris, Illinois and the storage pool at West Valley, New York (on land owned by the State of New York and leased to NFS thru 1980) are licensed to store spent fuel. The storage pool at West Valley is not full but NFS is presently not accepting any additional spent fuel for storage, even from those power generating facilities that had contractual arrangements with NFS. Construction of the AGNS receiving and storage station has been completed. AGNS has applied for - but has not been granted - a license to receive and store irradiated fuel assemblies in the storage pool at Barnwell prior to a decision on the licensing action relating to the separation facility.

4.0 The Plant

A description of the Peach Bottom Units is contained in the Final Environmental Statement (FES) issued by the Commission in April 1973. Pertinent descriptions of principal features relevant to the proposed modification are summarized below to aid the reader in following the evaluation in subsequent sections of this appraisal.

4.1 Fuel Inventory

The reactor core of each Unit contains 764 fuel assemblies. During a refueling, which occurs every twelve to eighteen months, between 270 to 280 fuel assemblies are discharged to the spent fuel pool. The assemblies now in use were manufactured by the General Electric Company.

4.2 Station Cooling Water Systems

The Peach Bottom circulating water system is an open cycle (once through) cooling system for the Unit condensers which employs helper cooling towers. Cooling water is withdrawn directly from Conowingo Pond and discharged to a 4700 ft. canal. Water from this canal can be diverted to mechanical draft cooling towers for partial cooling before it is discharged back to the pond. The condenser cooling water has a normal flow rate of 750,000 gallons per minute per Unit and removes approximately 7.6×10^9 BTU/hr of heat from the condenser of each Unit.

The spent fuel pool cooling water heat exchangers are provided cooling from the plant's service water system. Booster pumps in the service water system provide coolant water at a rate of approximately 1000 gallons per minute. Each SFP heat exchanger is designed to transfer 3.75×10^6 BTU/hr from 115°F fuel pool water to 90°F service water.

Other plant cooling water systems are not directly applicable to this licensing action.

4.3 Radioactive Wastes

The plant contains waste treatment systems designed to collect and process the gaseous, liquid and solid waste that might contain radioactive material. The waste treatment systems are evaluated in the Final Environmental Statement (FES) dated April 1973. There will be no change in the waste treatment systems described in Section III.D.2 of the FES because of the proposed modification. The impact of additional waste generated by this modification is discussed in Section 5.3 below.

4.4 Purpose of SFP

Each SFP at Peach Bottom was designed to store spent fuel assemblies prior to shipment to a reprocessing facility. These assemblies may be transferred from the reactor core to the SFP during a core refueling, or to allow for inspection and/or modification of core internals. The latter may require the removal and storage of up to a full core. The assemblies are initially intensely radioactive due to their fission product content and have a high thermal output. They are stored in the SFP to allow for radioactive and thermal decay.

The major portion of decay occurs during the 150-day period following removal from the reactor core. After this period, the assemblies may be withdrawn and placed into a heavily shielded fuel cask for offsite shipment. Space permitting, the assemblies may be stored for an additional period allowing continued fission product decay and thermal cooling prior to shipment.

4.5 Spent Fuel Pool Cooling and Purification System

The SFP cooling and purification system for each Unit consists of three 580 gpm circulating pumps, three heat exchangers, a filter-demineralizer and the required piping, valves and instrumentation. The pumps draw water from two skimmer surge tanks. This flow is passed through the filter-demineralizer and heat exchanger and returned to the pool. The filter-demineralizer may be bypassed. There is one spare filter-demineralizer which may be used by either Unit.

Each of the SFP heat exchangers is designed to transfer $3.75x10^6$ BTU/hr from 115°F fuel pool water to 90°F service water which is flowing through the heat exchanger at a rate of $4.0x10^5$ pounds per hour. The licensee's submittal states that when a full core is offloaded into the SFP, the Residual Heat Removal System will be used to maintain the fuel pool water temperature below 150°F.

5.0 Environmental Impact of Proposed Action

5.1 Land Use

The proposed modification will not alter the external physical geometry of the SFP. The SFP is entirely contained within the existing reactor building structure. No additional commitment of land is required. The SFP was designed to store spent fuel assemblies under water for a period of time to allow shorter-lived radioactive isotopes to decay and to reduce their thermal heat output. The Commission has never set a limit on how long spent fuel assemblies could be stored onsite. The longer the fuel assemblies decay, the less radioactivity they contain. The proposed modification will not change the basic land use of the SFP. The pool was designed to store the spent fuel assemblies for at least four normal refuelings. The modification would provide storage for at least ten normal refuelings. The pool was intended to store spent fuel. This use will remain unchanged by the proposed modification. The proposed modification will make more efficient use of the land already designated for spent fuel storage.

5.2 Water Use

There is no significant change in plant water usage as a result of the proposed modification. As discussed in the Safety Evaluation supporting this amendment, storing additional spent fuel in the SFP will slightly increase the heat load on the SFP cooling system. The modification will not change the flow rates within the cooling system. With the increased spent fuel storage, normal refueling sequences without a full core discharge will result in a pool stabilization temperature below the 150°F used as a design basis in the Final Safety Analysis Report (FSAR). The maximum expected heat load occurs after discharge of a full core. The SFP cooling system has adequate design capacity following discharge of a full core to maintain the pool water temperature below the 150°F design value in the FSAR even with the increased storage of spent fuel associated with the proposed modification. Since the temperature of the SFP water during normal refueling operations will remain below 150°F, the rate of evaporation and thus the need for makeup water will not be significantly changed by the proposed modification.

5.3 Radiological

5.3.1 Introduction

The potential offsite radiological environmental impacts associated with the expansion of the spent fuel storage capacity were evaluated and determined to be environmentally insignificant as addressed below.

The additional spent fuel which would be stored due to the expansion is the oldest fuel which has not been shipped from the plant. This fuel should have decayed at least five years. During the storage of the spent fuel under water, both volatile and nonvolatile radioactive nuclides may be released to the water from the surface of the assemblies or from defects in the fuel cladding. Most of the material released from the assemblies consists of activated corrosion products such as Co-58, Co-60, Fe-59 and Mn-54 which are not volatile. The radionuclides that might be released to the water through defects in the cladding, such as Cs-134, Cs-137, Sr-89 and Sr-90 are also predominately nonvolatile. The primary impact of such nonvolatile radioactive nuclides is their contribution to radiation levels to which workers in and near the SFP would be exposed. The volatile fission product nuclides of most concern that might be released through defects in the fuel cladding are the noble gases (xenon and krypton), tritium and the iodine isotopes.

Experience indicates that there is little radionuclide leakage from spent fuel stored in pools after the fuel has cooled for several months. The predominant radionuclides in the spent fuel pool water appear to be radionuclides that were present in the reactor coolant system prior to refueling (which becomes mixed with water in the spent fuel pool during refueling operations) or crud dislodged from the surface of the spent fuel during transfer from the reactor core to the SFP. During and after refueling, the spent fuel pool cleanup system reduces the radioactivity concentrations considerably. It is theorized that most failed fuel contains small, pinhole-like perforations in the fuel cladding at the reactor operating condition of appoximately 800°F. A few weeks after refueling, the spent fuel cools in the spent fuel pool so that fuel clad temperature is relatively cool, approximately 180°F. This substantial temperature reduction should reduce the rate of release of fission products from the fuel pellets and decrease the gas pressure in the gap between pellets and clad, thereby tending to retain the fission products within the gap.

In addition, most of the gaseous fission products have short half-lives and decay to insignificant levels within a few months. Based on the operational reports submitted by Morris Operation (MO) (formerly Midwest Recovery Plant) at Morris, Illinois and Nuclear Fuel Services' (NFS) storage pool at West Valley, New York, and discussions with the operators, experience demonstrates that there has not been any significant leakage of fission products from spent light water reactor fuel stored at these facilities. Spent fuel has been stored in these two pools which, while it was in a reactor, was determined to have significant leakage and was therefore removed from the core. After storage in the onsite spent fuel pool, this fuel was later shipped to either MO or NFS for extended storage. Although the fuel exhibited significant leakage at reactor operating conditions, there was not significant leakage from this fuel in the offsite storage facility.

Because we expect only a small increase in radioactivity released to the pool water as a result of the proposed modification as discussed above, we conclude that the SFP purification system will keep concentrations of radioactivity in the pool water to levels which have existed prior to the modification.

5.3.2 Radioactive Material Released to Atmosphere

With respect to gaseous releases, the only significant noble gas isotope attributable to storing additional assemblies for a longer period of time would be Krypton-85. As discussed previously, experience has demonstrated that after spent fuel has decayed 4 to 6 months, there is no significant release of fission products from defective fuel. However, we have conservatively estimated that an additional 244 curies per year of Krypton-85 may be released from both units when the modified pools are completely filled. This increase would result in an additional total body dose of less than 0.008 mrem/year to an individual at the site boundary. This dose is insignificant when compared to the approximately 100 mrem/year that an individual receives from natural background radiation. The additional total body dose to the estimated population within a 50-mile radius of the plant is less than 0.005 man-rem/year. This is small compared to the fluctuations in the annual dose this population would receive from natural background radiation. Under our conservative assumptions, these exposures represent an increase of less than 0.1% of the exposures from the plant evaluated in the FES for the individual (Table V-5) and the population (Table V-6). Thus, we conclude that the proposed modification will not have any significant impact on exposures offsite.

Assuming that the spent fuel will be stored onsite for several years, Iodine-131 releases from spent fuel assemblies to the SFP water will not be significantly increased because of the expansion of the fuel storage capacity since the Iodine-131 inventory in the fuel will decay to negligible levels between refuelings.

Storing additional spent fuel assemblies may increase the bulk water temperature during normal refuelings above the 115°F used in the design analysis. When the modified pools are full, the pool water temperature may reach 145°F and may be above 115°F for as long as 32 days. It is not expected that there will be any significant change in the annual release of tritium or iodine as a result of the proposed modification from that previously evaluated in the FES.

Most airborne releases from the plant result from leakage of reactor coolant which contains tritium and iodine in higher concentrations than the spent fuel pool. Therefore, even if there were a slightly higher evaporation rate from the spent fuel pool, the increase in tritium and iodine released from the plant as a result of the increase in stored spent fuel would be small compared to the amount normally released from the plant and that which was previously evaluated in the FES. If levels of radioiodine become too high, the air can be diverted to charcoal filters for the removal of radioiodine before release to the environment. In addition, the plant radiological effluent Technical Specifications, which are not being changed by this action, restrict the total releases of gaseous activity from the plant including the SFP.

5.3.3 Solid Radioactive Wastes

The concentration of radionuclides in the pool is controlled by the filter-demineralizers and by decay of short-lived isotopes. The activity is high during refueling operations while reactor coolant water is introduced into the pool and decreases as the pool water is processed through the filter-demineralizer. The increase of radioactivity, if any, should be minor because the additional spent fuel to be stored is relatively cool, thermally, and radionuclides in the fuel will have decayed significantly.

While we believe that there should not be an increase in solid radwaste due to the modification, as a conservative estimate, we have assumed that the amount of solid radwaste may be increased by about 190 cubic feet of resin a year from the demineralizer (about seventeen additional resin beds/year) for each unit. The estimated annual average amount of solid waste shipped from Peach Bottom 2/3 for 1974 to 1976 is about 27,000 cubic feet per year. If the storage of additional spent fuel does increase the amount of solid waste from the SFP purification systems by about 380 cubic feet per year, the increase in total waste volume shipped would be less than 1.5% and would not have any significant environmental impact.

The present spent fuel racks to be removed from the SFP are contaminated and will be disposed of as low level waste. We have estimated that less than 13,500 cubic feet of solid radwaste will be removed from the SFP of each unit because of the proposed modification. This is the total for both steps of the modification. Therefore, the total waste shipped from the plant will be increased by about 2.5% per year when averaged over the lifetime of the plant. This will not have any significant environmental impact.

5.3.4 <u>Radioactivity Released to Receiving Waters</u>

There should not be a significant increase in the liquid release of radionuclides from the plant as a result of the proposed modification. The amount of radioactivity on the SFP filter-demineralizer might slightly increase due to the additional spent fuel in the pool but this increase of radioactivity should not be released in liquid effluents from the station.

The demineralizer resins are periodically flushed with water to the condensate phase separator tank. The water used to transfer the spent resin is decanted from the tank and returned to the liquid radwaste system for processing. The soluble radioactivity will be retained on the resins. If any activity should be transferred from the spent resin to this flush water, it would be removed by the liquid radwaste system.

Leakage from the SFP is collected in the Reactor Building floor drain sumps. This water is transferred to the liquid radwaste system and is processed by the system before any water is discharged from the station.

5.3.5 Occupational Exposures

We have reviewed the licensee's plan for the removal, crating and disposal of the low density racks and the installation of the high density racks in two steps with respect to occupational radiation exposure. The occupational exposure for this entire operation is estimated by the licensee to be about 20 man-rem for each unit. We consider this to be a conservative estimate based on relevant experience for similar operations. This operation is expected to be a small fraction of the total annual man-rem burden from occupational exposure.

We have estimated the increment in onsite occupational dose resulting from the proposed increase in stored fuel assemblies on the basis of information supplied by the licensee and by utilizing relevant assumptions for occupancy times and for dose rates in the spent fuel pool area from radionuclide concentrations in the SFP water. The spent fuel assemblies themselves contribute a negligible amount to dose rates in the pool area because of the depth of water shielding the fuel. The occupational radiation exposure resulting from the proposed action represents a negligible burden. Based on present and projected operations in the spent fuel pool area, we estimate that the proposed modification should add less than one percent to the total annual occupational radiation exposure burden at this facility. Thus, we conclude that storing additional fuel in the SFP will not result in any significant increase in doses received by occupational workers.

5.3.6 Impacts of Other Pool Modifications

As discussed above, the additional radiological environmental impacts in the vicinity of Peach Bottom 2/3 resulting from the proposed modification are very small fractions (less than 1%) of the impacts evaluated in the Peach Bottom 2/3 FES. These additional impacts are too small to be considered anything but local in character.

Based on the above, we conclude that an SFP modification at any other facility should not significantly contribute to the environmental impact of the Peach Bottom Atomic Power Station and that the Peach Bottom 2/3 SFP modification should not contribute significantly to the environmental impact of any other facility.

5.3.7 Evaluation of Radiological Impact

As discussed above, the proposed modification does not significantly change the radiological impact evaluated in the FES.

5.4 Nonradiological Effluents

There will be no change in the chemical effluents from the station as a result of the proposed modification.

The only potential offsite nonradiological environmental impact that could arise from this proposed action would be an additional discharge of heat, mainly to the atmosphere and to Conowingo Pond. Storing spent fuel in the SFP for a longer period of time will add more heat to the SFP water. The SFP heat exchangers are cooled by the Plant Service Water System as described in Section 10.5 of the FSAR.

An evaluation of the augmented spent fuel storage facility was made to determine the effects of the increased heat generation on the plant cooling water systems, and ultimately, on the environment. The heat load resulting from the presence of 2816 spent fuel assemblies is within the capabilities of the existing cooling system. No adjustment to flow rates or system modifications are required.

As stated in our Safety Evaluation (SE) supporting this amendment we find that the maximum incremental heat load that will be added by increasing the number of spent fuel assemblies that are to be stored in each of these pools from 1110 to 2816 will be within the capacity of the SFP cooling system to maintain the pool outlet water temperature below 150°F. Our evaluation in the SE is that this is an acceptable limit.

5.5 Impacts on the Community

No environmental impacts on the environs outside the spent fuel storage building are expected during installation of the new racks. The impacts within this building are expected to be limited to those normally associated with metal working activities. No significant environmental impact on the community is expected to result from the proposed action.

6.0 Environmental Impact of Postulated Accidents

Although the new high density racks will accommodate a larger inventory of spent fuel, we have determined that the installation and use of the racks will not change the radiological consequences of a postulated fuel handling accident in the SFP area from those values reported in the FES for Peach Bottom 2/3 dated April 1973.

Additionally, the NRC staff has under way a generic review of load handling operations in the vicinity of spent fuel pools to determine the likelihood of a heavy load impacting fuel in the pool and, if necessary, the radiological consequences of such an event. Because Peach Bottom 2/3 will be required by Technical Specifications to prohibit loads greater than the weight of a fuel assembly to be transported over spent fuel in the SFP, we have concluded that the likelihood of a heavy load handling accident is sufficiently small that the proposed modification is acceptable and no additional restrictions on load handling operations in the vicinity of the SFP are necessary while our review is under way.

7.0 Alternatives

In regard to this licensing action, the staff has considered the following alternatives: (1) shipment of spent fuel to a fuel reprocessing facility, (2) shipment of spent fuel to a separate fuel storage facility, (3) shipment of spent fuel to another reactor site, and (4) ceasing operation of the facility.

7.1 Reprocessing of Spent Fuel

As discussed earlier, none of the three commercial reprocessing facilities in the U.S. are currently operating. The General Electric Company's Midwest Fuel Recovery Plant (MFRP) at Morris, Illinois is in a decommissioned condition. On September 22, 1976, Nuclear Fuel Services, Inc. (NFS) informed the Nuclear Regulatory Commission that they were "withdrawing from the nuclear fuel reprocessing business." The Allied General Nuclear Services (AGNS) reprocessing plant received a construction permit on December 18, 1970. In October 1973, AGNS applied for an operating license for the separation facility; construction of the separation facility is essentially complete. On July 3, 1974, AGNS applied for a materials license to receive and store up to 400 MTU in spent fuel in the onsite storage pool, on which construction has been completed. Hearings on the materials license application have not been completed.

In 1976, Exxon Nuclear Company, Inc. submitted an application for a proposed Nuclear Fuel Recovery and Recycling Center (NFRRC) to be located at Oak Ridge, Tennessee. The plant would include a storage pool that could store up to 7,000 MTU in spent fuel.

On April 7, 1977, the President issued a statement outlining his policy on continued development of nuclear energy in the U.S. The President stated that: "We will defer indefinitely the commercial reprocessing and recycling of the plutonium produced in the U. S. nuclear power programs. From our own experience, we have concluded that a viable and economic nuclear power program can be sustained without such reprocessing and recycling."

The Nuclear Regulatory Commission issued an order dated December 30, 1977 terminating proceedings to license reprocessing facilities. (42 FR 65334)

The licensee has intended to reprocess the spent fuel to recover and recycle the uranium and plutonium in the fuel. Due to a change in national policy and circumstances beyond the licensee's control, reprocessing of the spent fuel is not an available option at this time.

7.2 Independent Spent Fuel Storage Facility

An alternative to expansion of onsite spent fuel pool storage is the construction of new "independent spent fuel storage installations" (ISFSI). Such installations could provide storage space in excess of 1,000 MTU of spent fuel. This is far greater than the capacities of onsite storage pools. Fuel storage pools at GE Morris and NFS are functioning as ISFSIs although this was not the original design intent. Likewise, if the AGNS receiving and storage station at its Barnwell, South Carolina reprocessing plant were licensed to accept spent fuel, it would be functioning as an ISFSI. The AGNS position, however, has generally been that it will not commercially operate a stand alone ISFSI. The license for the GE facility at Morris, Illinois was amended on December 3, 1975 to increase the storage capacity to about 750 MTU;* as of June 15, 1978, approximately 310 MTU was stored in the pool in the form of 1,196 assemblies. The staff has discussed the status of storage space at Morris Operations (MO) with GE personnel. We have been informed that GE is primarily operating the MO facility to store either fuel owned by GE (which had been leased to utilities on an energy basis) or fuel which GE had previously contracted to reprocess.** We understand that the present GE policy is not to accept spent fuel for storage except for that fuel for which GE has a previous commitment. The licensee has no current commitment from GE. THE NFS facility has capacity for about 260 MTU, with approximately 170 MTU presently stored in the pool. The storage pool at West Valley, New York is on land owned by the State of New York and leased to NFS thru 1980. Although the storage pool at West Valley is not full, since NFS withdrew from the fuel reprocessing business, correspondence we have received indicates that they are not at present accepting additional spent fuel for storage even from those reactor facilities with which they had contracts. The status of the storage pool at AGNS was discussed above.

*An application for an 1100 MTU capacity addition is pending, but proceedings have been suspended indefinitely.

**GE letter to NRC dated May 27, 1977.

With respect to construction of new ISFSIs, Regulatory Guide 3.24, "Guidance on the License Application, Siting, Design, and Plant Protection for an Independent Spent Fuel Storage Installation," issued in December 1974, recognizes the possible need for ISFSIs and provides recommended criteria and requirements for water-cooled ISFSIs. Pertinent sections of 10 CFR Parts 19, 20, 30, 40, 51, 70, 71 and 73 would also apply.

The staff has estimated that at least five years would be required for completion of an independent fuel storage facility. This estimate assumes one year for preliminary design; one year for preparation of the license application, Environmental Report, and licensing review in parallel with one year for detail design; two and one-half years for construction and receipt of an operating license; and one-half year for plant and equipment testing and startup.

Industry proposals for independent spent fuel storage facilities are scarce to date. In late 1974, E. R. Johnson Associates, Inc. and Merrill, Lynch, Pierce, Fenner and Smith, Inc. issued a series of joint proposals to a number of electric utility companies having nuclear plants in operation or contemplated for operation, offering to provide independent storage services for spent nuclear fuel. A paper on this proposed project was presented at the American Nuclear Society meeting in November 1975. In 1974, E. R. Johnson Associates estimated their construction cost at approximately $9,000 per spent fuel assembly.

Several licensees have evaluated construction of a separate independent spent fuel storage facility and have provided cost estimates. Connecticut Yankee, for example, estimated that to build an independent facility with a storage capacity of 1,000 MTU (BWR and/or PWR assemblies) would cost approximately $54 million and take about 5 years to put into operation. Commonwealth Edison estimated the construction cost to build a fuel storage facility at about $10,000 per fuel assembly. To this would be added costs for maintenance, operation, safeguards, security. interest on investment, overhead, transportation and other costs.

On December 2, 1976, Stone and Webster Corporation submitted a topical report requesting approval for a standard design for an independent spent fuel storage facility. No specific locations were proposed, although the design is based on location near a nuclear power facility. We estimated present day cost for such a fuel storage installation to be about $26 million. This does not include client costs associated with the nuclear power facility site preparation. On July 12, 1978 the staff concluded that the proposed approach and conceptual design was acceptable.

On a short-term basis (i.e., prior to 1983) an independent spent fuel storage installation does not appear to be a viable alternative based on cost or availability in time to meet the licensee's needs. It is also unlikely that the total environmental impacts of constructing an independent facility and shipment of spent fuel would be less than the minor impacts associated with the proposed action.

On October 18, 1977, USDOE announced a new "spent nuclear fuel policy." USDOE will determine industry interest in providing interim fuel storage services on a contract basis. If adequate private storage services cannot be provided, the Government will provide interim fuel storage facilities.

This interim storage is expected to be available in 1983 or 1984 with a National Waste Repository available in the 1988-1993 time frame. If the Peach Bottom SFP is not modified as proposed, the Peach Bottom Station, which lost the ability to discharge either core in February 1978, would have to shutdown both Units in 1982 since the SFP of both Units will be essentially full. The precise date that interim storage would be available is not known at this time with sufficient precision to provide for planning. Should these facilities not be available when needed, the Peach Bottom Station would be forced to shutdown. Therefore, this does not appear to be a viable alternative, especially when considering the impact of plant shutdown as compared with the negligible consequences of the proposed amendment.

The proposed increase in storage capacity will allow Peach Bottom Station to operate until September 1991 by which time interim storage and probably the Federal repository for spent fuel are expected to be operable.

7.3 Storage at Another Reactor Site

In addition to Peach Bottom Units 2 and 3, the licensee owns Peach Bottom Unit 1 and is constructing two units at the Limerick Generating Station. Peach Bottom Unit 1 is a small (40 MWe) prototype High Temperature Gas-Cooled Reactor which is being decommissioned. Its SFP is not designed to store BWR fuel. To use this pool for storage at the same site would require extensive modifications and seismic analysis at a cost in excess of that which would result from the modification proposed by the licensee. Further, this alternative would result in additional personnel exposures and does not provide sufficient certainty of timely availability.

The Limerick Generating Station Units 1 and 2 (LGS 1/2) are scheduled to begin commercial operation in 1983 and 1984 respectively. It is possible (assuming no additional construction delays) that the SFP for LGS 1 might be available for storage of Peach Bottom fuel in mid-to-late 1982, approximately one year after Peach Bottom 2 would have to cease operation because of lack of fuel storage. Use of LGS 1/2 SFP would limit the licensee's ability to operate the Limerick Station. According to a survey conducted and documented by the Energy Research and Development Administration, up to 46 percent of the operating nuclear power plants will lose the ability to refuel during the period 1975-1984 without additional spent fuel storage pool expansions or access to offsite storage facilities. Thus, the licensee cannot rely on any other power facility to provide additional storage capability except on a short-term emergency basis. If space were available in another reactor facility, the cost would probably be comparable to the cost of storage at a commercial storage facility.

In the absence of a general policy regarding interfacility transfer and storage of spent fuel, such action is being decided on a case-by-case basis and would not afford the timely relief needed here.

Storage at another reactor site is not a realistic alternative at this time, or in the foreseeable future.

7.4 Shutdown of Facility

If Peach Bottom Station was forced to shutdown for lack of space to store spent fuel, there would be the loss of the economic benefit from the facility (generation of electric energy) and a cost associated with purchase of replacement energy and maintaining the facility in a standby condition far in excess of the cost of the proposed modification.

Based on information gained from the licensee and comparable data for other operating reactors, the staff estimates that the loss of revenues from the idle unit would be about $318,000/day-Unit.

7.5 Summary of Alternatives

In summary, the alternatives (1) to (3) described above are presently not available to the licensee or could not be made available in time to meet the licensee's need. Assuming the nonavailability of alternatives (1) to (3), the licensee would be forced to either shutdown or request additional spent fuel storage capacity. Even if available, alternatives (2) and (3) do not provide the operating flexibility or the proposed action and are likely more expensive than the proposed modification.

Alternative (4), ceasing operation of the facility, would be much more expensive than the proposed action because of the need to provide replacement power. In addition to the economic advantages of the proposed action, we have determined that the expansion of the storage capacity of the SFP for Peach Bottom Units 2 and 3 would have a negligible environmental impact.

8.0 Evaluation of Proposed Action

8.1 Unavoidable Adverse Environmental Impacts

8.1.1 Physical Impacts

As discussed above, expansion of the storage capacity of the SFP would not result in any significant unavoidable adverse environmental impacts on the land, water, air or biota of the area.

8.1.2 Radiological Impacts

As discussed in Section 5.3, expansion of the storage capacity of the SFP will not create any significant additional radiological effects. The additional total body dose that might be received by an individual or the estimated population within a 50-mile radius is less than 0.008 mrem/yr and 0.005 man-rem/yr, respectively. These exposures are small compared to the fluctuations in the annual dose this population receives from background radiation and represent an increase of less than 0.1% of the exposures from the plant evaluated in the FES. The total occupational exposure of workers during removal of the present storage racks and installation of the new racks is estimated by the licensee to be about 20 man-rem for each unit. This is a small fraction of the total man-rem burden from occupational exposure at the station. Operation of the plant with additional spent fuel in the SFP is not expected to increase the occupational radiation exposure by more than one percent of the present total annual occupational exposure at this facility.

8.2 Relationships Between Local Short-Term Use of Man's Environment and The Maintenance and Enhancement of Long-Term Productivity

Expansion of the storage capacity of the SFP will not change the evaluation of long-term use of the land as described in the FES for Peach Bottom Units 2 and 3. In the short term, the proposed modification would permit the expected benefits (i.e., production of electrical energy) to continue.

8.3 Irreversible and Irretrievable Commitments of Resources

8.3.1 Water, Land and Air Resources

The proposed action will not result in any significant change in the commitments of water, land and air resources as identified in the FES for Peach Bottom Units 2 and 3. No additional allocation of land would be made; the land area now used for the SFP would be used more efficiently by adopting the proposed action.

8.3.2 Material Resources

It is not likely that taking licensing action here proposed would constitute a commitment of resources that would tend to significantly foreclose the alternatives available with respect to any other individual licensing action designed to ameliorate a possible shortage of spent fuel storage capacity. The time frame under consideration is two years, the staff's estimate of the time necessary to complete the generic environmental statement. The action here proposed will not have any significant effect on whether similar actions are or should be taken at other nuclear reactors since it will not affect either the need for or availability of storage facilities at other nuclear reactors. Nor will the added capacity here significantly affect the need for the total additional storage space presently planned at reprocessing facilities for which licensing actions are pending. In order to carry out the proposed modifications, the licensee will require custom-made racks of aluminum and sheets of Boral. These materials are readily available in abundant supply. In the context of this criterion, the staff concludes that the amount of material (aluminum, boron, carbon) required for the racks for Peach Bottom is insignificant and does not represent an irreversible commitment of natural resources.

The longer term storage of spent fuel assemblies withdraws the unburned uranium from the fuel cycle for a longer period of time. Its usefulness as a resource in the future, however, is not changed. The provision of longer onsite storage does not result in any cumulative effects due to plant operation since the throughput of materials does not change. Thus the same quantity of radioactive material will have been produced when averaged over the life of the plant. This licensing action would not constitute a commitment of resources that would affect the alternatives available to other nuclear power plants or other actions that might be taken by the industry in the future to alleviate fuel storage problems. No other resources need be allocated because the other design characteristics of the SFP remain unchanged.

8.4 Commission Policy Statement Regarding Spent Fuel Storage

On September 16, 1975, the Commission announced (40 F. R. 42801) its intent to prepare a generic environmental impact statement on handling the storage of spent fuel from light water reactors. In this notice, it also announced its conclusion that it would not be in the public interest to defer all licensing actions intended to ameliorate a possible shortage of spent fuel storage capacity pending completion of the generic environmental impact statement.

The Commission directed that in the consideration of any such proposed licensing action, the following five specific factors should be applied, balanced, and weighted in the context of the required enviornmental statement or appraisal.

a. Is it likely that the licensing action here proposed would have a utility that is independent of the utility of other licensing actions designed to ameliorate a possible shortage of spent fuel capacity?

The reactor core for each of the Peach Bottom Units contains 764 fuel assemblies. In their submittal of January 18, 1978, the licensee presented their estimated schedule for refueling. The facility is scheduled to be refueled at approximately 18 month intervals with about 260 to 280 fuel assemblies generally scheduled to be replaced. The spent fuel pool was designed on the basis that a fuel cycle would be in existence that would only require storage of spent fuel for a year or two prior to shipment to a reprocessing facility. Therefore, a pool storage capacity for 1110 assemblies in each pool (about 150% of the full core load) was considered adequate. This provided for complete unloading of the reactor even if the spent fuel from the two previous refuelings were in the pool. It is prudent engineering practice to reserve space in the SFP to receive an entire reactor core, should this be necessary to inspect or repair core internals or because of other operational considerations.

Peach Bottom Unit 2 began commercial operation on July 5, 1974, and completed its third operating cycle in September 1978. With the present spent fuel storage racks, Unit 2 does not have sufficient room to store the normal discharge of spent fuel for the fifth cycle, scheduled to begin in September 1981. If expansion of the storage capacity of the SFP is not approved, or if an alternate storage facility for the spent fuel is not located, Peach Bottom Unit 2 will have to shutdown in 1981.

Peach Bottom Unit 3 began commercial operation on December 23, 1974 and will complete its third operating cycle in February 1979. With the present spent fuel storage racks, Unit 3 does not have sufficient room to store the normal discharge of spent fuel for the fifth cycle, scheduled to begin in August 1982. If expansion of the storage capacity of the SFP is not approved, or if an alternate storage facility for the spent fuel is not located, Peach Bottom Unit 3 will have to shutdown in 1982. As discussed under alternatives (Section 7.0), an alternate storage facility is not now available. As a long term solution to the spent fuel storage problem, the Federal government is planning to provide a retrievable repository for spent fuel by 1983.

The proposed licensing action (i.e., installing new racks of a design that permits storing more assemblies in the same space) would allow Peach Bottom Unit Nos. 2 and 3 to continue to operate beyond 1982 and until the proposed Federal repository is expected to be in operation. The proposed modification will also provide the licensee with additional flexibility which is desirable even if adequate offsite storage facilities hereafter become available to the licensee.

We have concluded that a need for additional spent fuel storage capacity exists at Peach Bottom which is independent of the utility of other licensing actions designed to ameliorate a possible shortage of spent fuel capacity.

b. Is it likely that the taking of the action here proposed prior to the preparation of the generic statement would constitute a commitment of resources that would tend to significantly foreclose the alternatives available with respect to any other licensing actions designed to ameliorate a possible storage of fuel storage capacity?

With respect to this proposed licensing action, we have considered commitment of both material and nonmaterial resources. The material resources considered are those to be utilized in the expansion of the SFP.

The increased storage capacity of the Peach Bottom storage pools was considered as a nonmaterial resource and was evaluated relative to proposed similar licensing actions within a one year period (the time we estimate necessary to complete the generic environmental statement) at other nuclear power plants, fuel reprocessing facilities and fuel storage facilities. We have determined that the proposed expansion in the storage capacity of the SFP is only a measure to allow for continued operation and to provide operational flexibility at the facility, and will not affect similar licensing actions at other nuclear power plants. Similarly, taking this action would not commit the NRC to repeat this action or a related action in 1981.

We conclude that the expansion of the SFP at Peach Bottom Units 2 and 3, prior to the preparation of the generic statement, does not constitute a commitment of either material or nonmaterial resources that would tend to significantly foreclose the alternatives available with respect to any other individual licensing actions designed to ameliorate a possible shortage of spent fuel storage capacity.

c. Can the environmental impacts associated with the licensing action here proposed be adequately addressed within the context of the present application without overlooking any cumulative environmental impacts?

Potential nonradiological and radiological impacts resulting from the fuel racks conversion and subsequent operation of the expanded SFP at this station were considered by the Staff.

No environmental impacts on the environs outside the spent fuel storage building are expected during removal of the existing racks and installation of the new racks. The impacts within this building are expected to be limited to those normally associated with metal working activities and to the occupational radiation exposure to the personnel involved.

The potential nonradiological environmental impact attributable to the additional heat load in the SFP was determined to be negligible compared to the existing thermal effluents from the facility.

We have considered the potential radiological environmental impacts associated with the expansion of the SFPs and have concluded that they would not result in radioactive effluent releases that significantly affect the quality of the human environment during either normal operation or the expanded SFPs or under postulated fuel handling accident conditions.

d. Have the technical issues which have arisen during the review of this application been resolved within that context?

This Environmental Impact Appraisal and the accompanying Safety Evaluation respond to the questions concerning health, safety and environmental concerns.

e. Would a deferral or severe restriction on this licensing action result in substantial harm to the public interest?

We have evaluated the alternatives to the proposed action, including storage of the additional spent fuel offsite and ceasing power generation from the plant when the existing SFP is full. We have determined that there are significant economic advantages associated with the proposed action and that expansion of the storage capacity of the SFPs will have a negligible environmental impact. Accordingly, deferral or severe restriction of the action here proposed would result in substantial harm to the public interest.

9.0 Benefit-Cost Balance

This section summarizes and compares the cost and the benefits resulting from the proposed modification to those that would be derived from the selection and implementation of alternatives. The table, attached, presents a tabular comparison of these costs and benefits. The benefit that is derived from three of these alternatives is the continued operation of Peach Bottom Units 2 and 3 and production of electrical energy. The remaining alternatives (i.e., reprocessing of the spent fuel or storage at other nuclear plants) are not possible at this time or in the foreseeable future except on a short term emergency basis and, therefore, have no associated cost or benefit.

From examination of the table, it can be seen that the most cost-effective alternative is the proposed SFP modifications. As evaluated in the preceding sections, the environmental impacts associated with the proposed modification would not be significantly changed from those analyzed in the Final Environmental Statement for Peach Bottom Atomic Power Station Unit Nos. 2 and 3 issued in April 1973.

10.0 Basis and Conclusion for not Preparing an Environmental Impact Statement

We have reviewed this proposed facility modification relative to the requirements set forth in 10 CFR Part 51 and the Council of Environmental Quality's Guidelines, 40 CFR 1500.6 and have applied, weighted, and balanced the five factors specified by the Nuclear Regulatory Commission in 40 CFR 42801. We have determined that the proposed license amendment will not significantly affect the quality of the human environment and that there will be no significant environmental impact attributable to the proposed action other than that which has already been predicted and described in the Commission's Final Environmental Statement for the Facility dated April 1973. Therefore, the Commission has found that an environmental impact statement need not be prepared, and that pursuant to 10 CFR 51.5(c), the issuance of a negative declaration to this effect is appropriate.

Dated: November 30, 1978

Alternative	Cost	Benefit
Reprocessing of Spent Fuel	-	None - this alternative is not available either now or in the foreseeable future.
Increase storage capacity of Peach Bottom's SFPs	$3630/assembly	Continued operation of Peach Bottom Station and production of electrical energy.
Storage at Peach Bottom Unit 1	>$3630/assembly	Continued operation of Peach Bottom 2&3; requires modification to Unit 1 SFP and does not preclude use of high density racks at PB Unit 1.
Storage at other nuclear plants	Comparable to storage at Peach Bottom 2/3	Continued operation of Peach Bottom 2/3 and production of electricity. However, this alternative is not likely to be available.
Storage at Limerick	-	None - Limerick storage not available on a timely basis.
Storage at Independent Facility	-	This alternative not available.
Storage at Reprocessing Facility	-	This alternative not available.
Reactor Shutdown	$318,000/day-Unit	None- No production of electrical energy.

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKETS NOS. 50-277 AND 50-278

PHILADELPHIA ELECTRIC COMPANY, ET AL

PEACH BOTTOM UNITS NOS. 2 AND 3

NOTICE OF ISSUANCE OF AMENDMENTS TO FACILITY OPERATING LICENSES AND NEGATIVE DECLARATION

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendments Nos. 49 and 48 to Facility Operating License No. DPR-44 and DPR-56, issued to Philadelphia Electric Company, Public Service Electric and Gas Company, Delmarva Power and Light Company and Atlantic City Electric Company, which revised the Technical Specifications for operation of the Peach Bottom Atomic Power Station Units Nos. 2 and 3, located in York County, Pennsylvania. The amendments are effective as of the date of issuance.

These amendments revise the Technical Specifications to increase the total storage capacity of the spent fuel pools at Peach Bottom Atomic Power Station Units Nos. 2 and 3 from 2220 to 5632 fuel assemblies.

The applications for the amendments comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendments. Notice of Proposed Issuance of Amendments to Facility Operating Licenses in connection with this action was published in the

FEDERAL REGISTER on February 23, 1978 (43FR7490). No request for a hearing or petition for leave to intervene was filed following notice of the proposed action.

The Commission has prepared an environmental impact appraisal for this action and has concluded that an environmental impact statement for this particular action is not warranted because there will be no significant environmental impact attributable to the action other than that which has already been predicted and described in the Commission's Final Environmental Statement for the facility dated April 1973.

For further details with respect to this action, see (1) applications for amendments dated January 18, April 12, May 19, June 12 and September 19, 1978, (2) Amendments Nos. 49 and 48 to License Nos. DPR-44 and DPR-56, (3) the Commission's related Safety Evaluation, and (4) the Commission's related Environmental Impact Appraisal. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at Government Publications Section, State Library of Pennsylvania, Education Building, Commonwealth and Walnut Streets, Harrisburg, Pennsylvania 17126. A copy of items (2), (3) and (4) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland, this 30th day of November 1978.

FOR THE NUCLEAR REGULATORY COMMISSION

Thomas A. Ippolito, Chief
Operating Reactors Branch #3
Division of Operating Reactors