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OCT 1 6 1974

Docket No. 50-277

Philadelphia Electric Company
ATTN: Mr. J. L. Hankins
Vice President
2301 Market Street
Philadelphia, Pennsylvania 19101

Gentlemen:

The Commission has issued the enclosed Amendment No. 14 to Facility Operating License No. DPR-44 for Peach Bottom Atomic Power Station, Unit No. 2. The amendment includes Change No. 16 to the Technical Specifications, Appendix A, and is an interim measure to allow operating flexibility while the proposed change as requested in your application of July 12, 1974, is under consideration.

The amendment permits operation with revised maximum average planar linear heat generation rate curves up to an average planar exposure of 9000 MWD/T.

Copies of the related Safety Evaluation and the Federal Register Notice are also enclosed.

Sincerely,

Original Signed

George Lear, Chief
Operating Reactors Branch #3
Directorate of Licensing

Enclosures:
1. Amendment No. 14
2. Safety Evaluation
3. Federal Register Notice

cc: See next page

bcc: H. J. McAlduff, ORO
J. R. Buchanan, ORNL
T. B. Abernathy, DTIE
A. Rosenthal, ASLAB
N. H. Goodrich, ASLBP

OFFICE	ORB#3	ORB#3	ORB#3	OGC	L:AD/ORs
SURNAME	DMElliott:kmf	SATeets	GLear		KRGoller
DATE	10/16/74	10/16/74	10/16/74	10/16/74	10/16/74

Form AEC-318 (Rev. 9-53) AECM 0240

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cc: w/enclosures

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Assistant General Counsel
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Philadelphia, Pennsylvania 19101

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Board of Supervisors
Peach Bottom Township
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Wilmer P. Bolton
Chairman, Board of Supervisors
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Mrs. Louisa R. Yeagley
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Philadelphia, Pennsylvania 19106

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DATE ➤						

PHILADELPHIA ELECTRIC COMPANY

DOCKET NO. 50-277

PEACH BOTTOM ATOMIC POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 14
License No. DPR-44

1. The Atomic Energy Commission (the Commission) has found that:

   A. The application for amendment by Philadelphia Electric Company (the licensee) dated July 12, 1974, complies 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. Prior public notice of this amendment is not required since the amendment does not involve a significant hazards consideration.

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

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"(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications, as revised by issued changes thereto through Change No. 5"

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

FOR THE ATOMIC ENERGY COMMISSION

Original Signed

Karl R. Goller, Assistant Director
for Operating Reactors
Directorate of Licensing

Attachment:
Change No. 6 to the
Technical Specifications

Date of Issuance: OCT 1 6 1974

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☆ U. S. GOVERNMENT PRINTING OFFICE: 1974-526-166

ATTACHMENT TO LICENSE AMENDMENT NO. 44

(CHANGE NO. 6 TO THE TECHNICAL SPECIFICATIONS)

FACILITY OPERATING LICENSE NO. DPR-44

DOCKET NO. 50-277

Replace pages 133a, 133b, 134, 140, 140a and 142 with the attached revised pages. (No changes made on page 134.)

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LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
3.5.I Average Planar LHGR During steady state power operation, up to an average planar exposure of 9000 MWD/T, the average linear heat generation rate (LHGR) of all the rods in any fuel assembly, as a function of average planar exposure, at any axial location, shall not exceed the maximum average planar LHGR shown in Figure 3.5.1.A.*	4.5.I Average Planar LHGR Daily during reactor power operation, the average planar LHGR shall be checked.
3.5.J Local LHGR During steady state power operation, the linear heat generation rate (LHGR) of any rod in any fuel assembly at any axial location shall not exceed the maximum allowable LHGR as calculated by the following equation: $LHGR_{max} \leq LHGR_d \left[1 \left(\frac{\Delta P}{P}\right)_{max} \left(\frac{L}{L_T}\right)\right]$ $LHGR_d$ = Design LHGR = 18.5 kw/ft. $\frac{\Delta P}{P_{max}}$ = Maximum power spiking penalty = 0.037 unit 2 = 0.032 unit 3 L_T = Total core length = 12 ft. = 12 feet Unit 2 = 12.167 feet Unit 3 L = Axial position above bottom of core	4.5.J Local LHGR Daily during reactor power operation the local LHGR shall be checked.

*On August 5, 1974, Philadelphia Electric Company submitted an Emergency Core Cooling System (ECCS) evaluation and proposed changes to the Technical Specifications in accordance with 10 CFR Part 50, Section 50.46. Upon submittal of the ECCS evaluation and proposed Technical Specifications, 10 CFR Part 50, Section 50.46(a)(2)(iv) required that the facility shall be operated within the (more conservative) limits of both the proposed and approved Technical Specifications. In order to satisfy 10 CFR Part 50, Section 50.46, facility operation shall therefore be within all the limits and restrictions

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT

*of both this Technical Specification change and the ECCS evaluation, including the proposed Technical Specifications, submitted on August 5, 1974, unless modified by the Director of Regulation pursuant to 10 CFR Part 50, Section 50.46 (a)(2)(v).

3.5.A BASES

Core Spray and LPCI Subsystems

This specification assures that adequate emergency cooling capability is available whenever irradiated fuel is in the reactor vessel.

Based on the loss-of-coolant analysis included in General Electric Topical Report NEDO-10329 and the sensitivity studies given in Supplement 1 thereto and subsection 6.7 of the FSAR and the Philadelphia Electric Company letter dated August 26, 1971, and in accordance with the AEC's "Interim Acceptance Criteria for Emergency Core Cooling Systems" published on June 19, 1971, any of the following cooling systems provides sufficient cooling to the core to dissipate the energy associated with the loss-of-coolant accident, to limit calculated fuel clad temperature to less than 2300°F to assure that core geometry remains intact, and to limit clad metal-water reaction to less than 1%; the two core spray subsystems; or either of the two core spray subsystems and two RHR pumps operating in the LPCI mode with operable LPCI injection valves.

The limiting conditions of operation in Specifications 3.5.A.1 through 3.5.A.6 specify the combinations of operable subsystems to assure the availability of the minimum cooling systems noted above.

Core spray distribution has been shown, in full-scale tests of systems similar in design to that of Peach Bottom 2 and 3, to exceed the minimum requirements by at least 25%. In addition, cooling effectiveness has been demonstrated at less than half the rated flow in simulated fuel assemblies with heater rods to duplicate the decay heat characteristics of irradiated fuel. The accident analysis is additionally conservative in that no credit is taken for spray coolant entering the reactor before the internal pressure has fallen to 105 psig.

The LPCI subsystem is designed to provide emergency cooling to the core by flooding in the event of a loss-of-coolant accident. This system functions in combination with the core spray system to prevent excessive fuel clad temperature. The LPCI subsystem and the core spray subsystem provide adequate cooling for break areas of approximately 0.2 square feet up to and including the double-ended recirculation line break without assistance from the high pressure emergency core cooling subsystems.

3.5 BASES (cont'd.)

H. Engineered Safeguards Compartments Cooling and Ventilation

One unit cooler in each pump compartment is capable of providing adequate ventilation flow and cooling. Engineering analyses indicate that the temperature rise in safeguards compartments without adequate ventilation flow or cooling is such that continued operation of the safeguards equipment or associated auxiliary equipment cannot be assured. Ventilation associated with the High Pressure Service Water Pumps is also associated with the Emergency Service Water pumps, and is specified in Specification 3.9.

I. Average Planar LHGR

This specification assures that the peak cladding temperature following the postulated design basis loss-of-coolant accident will not exceed the 2300°F limit specified in the Interim Acceptance Criteria (IAC) issued in June 1971 considering the postulated effects of fuel pellet densification.

The peak cladding temperature following a postulated loss-of-coolant accident is primarily a function of the average heat generation rate of all the rods of a fuel assembly at any axial location and is only dependent secondarily on the rod to rod power distribution within an assembly. Since expected local variations in power distribution within a fuel assembly affect the calculated peak clad temperature by less than $\pm$ 20 F relative to the peak temperature for a typical fuel design, the limit on the average linear heat generation rate is sufficient to assure that calculated temperatures are below the IAC limit.

J. Local LHGR

This specification assures that the linear heat generation rate in any rod is less than the design linear heat generation even if fuel pellet densification is postulated. The power spike penalty specified is based on the analysis presented in Section 3.2.1 of the GE topical report NEDM-10735 Supplement 6, and assumes a linearly increasing variation in axial gaps between core bottom and top, and assures with a 95% confidence, that no more than one fuel rod exceeds the design linear heat generation rate due to power spiking.

PEACH BOTTOM ATOMIC POWER STATION

UNIT 2

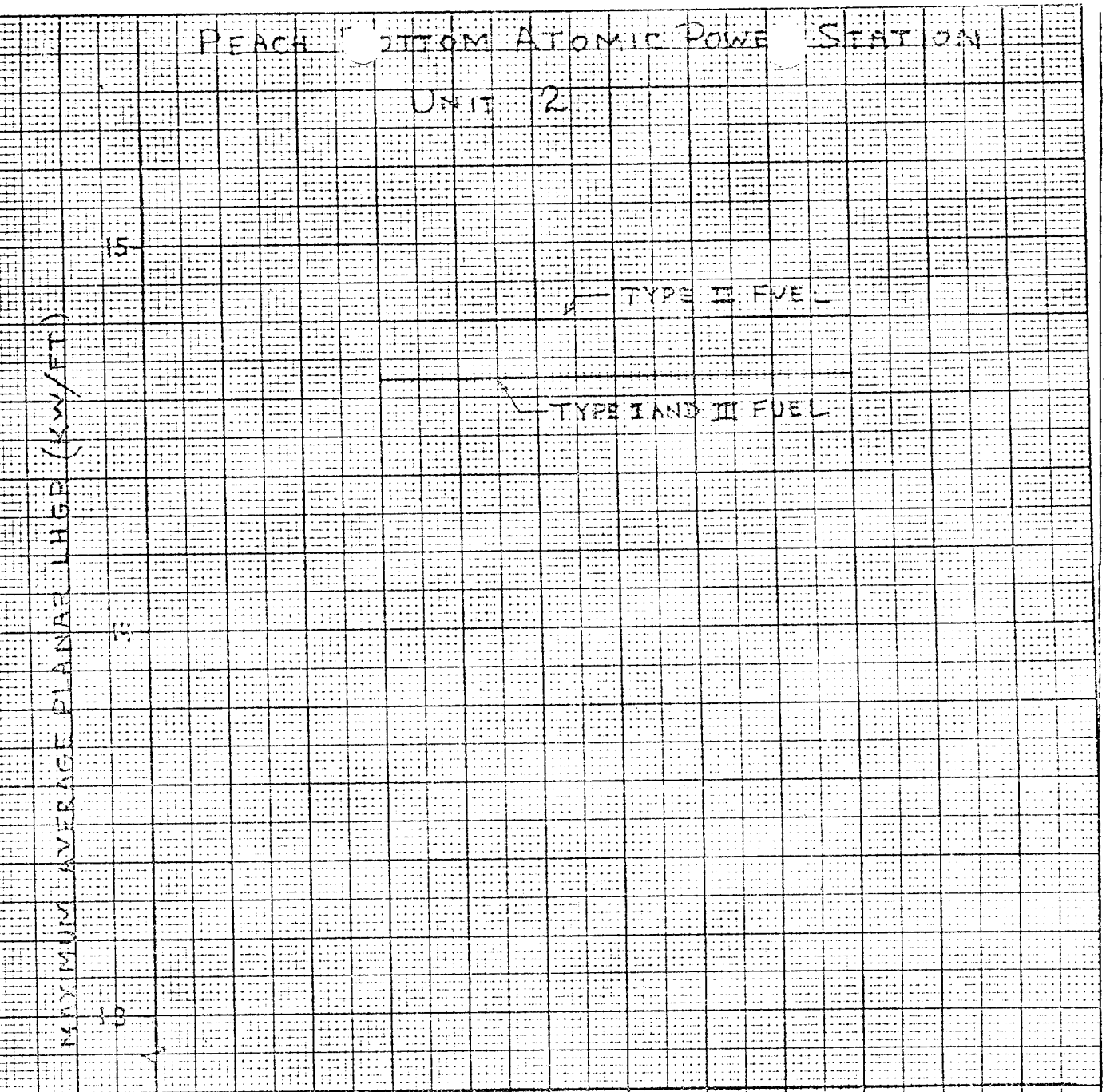

FIGURE 3.5.1

MAXIMUM ALLOWABLE AVERAGE PLANAR LHGR

SAFETY EVALUATION BY THE DIRECTORATE OF LICENSING

SUPPORTING AMENDMENT NO. 4 TO LICENSE NO. DPR-44

(CHANGE NO. 5 TO THE TECHNICAL SPECIFICATIONS)

PHILADELPHIA ELECTRIC COMPANY

PEACH BOTTOM ATOMIC POWER STATION, UNIT NO. 2

DOCKET NO. 50-277

Introduction

By letter dated July 12, 1974, Philadelphia Electric Company (PECo) proposed a change in the Technical Specifications of Facility Operating Licenses DPR-44 and DPR-56 for Peach Bottom Atomic Power Station, Units 2 and 3. The proposed change would replace the current maximum average planar linear heat generation rate (MAPLHGR) curves with revised curves of higher value, which were computed using the GEGAP III model for pellet-clad gap thermal conductance. GEGAP III is a calculational model which incorporates significant modifications to previously used calculational methods. These modifications include the incorporation of time-dependent fuel densification, time-dependent gap closure, and gap closure effects due to cladding creepdown. Because of the nature of the modifications in the GEGAP III calculational model, a notice will be issued stating that the Commission is considering its application to Peach Bottom Atomic Power Station, Units 2 and 3.

In order to allow operating flexibility during the period when the Commission is considering PECo's July 12, 1974 submittal, the staff has reanalyzed the MAPLHGR curve in the present Technical Specifications of Unit 2 and has determined a revised curve which applies up to an average planar exposure (fuel burnup) of 9000 MWD/T.based upon the more accurate data concerning gap closure due to pellet cracking and time dependent fuel densification which has become available since the Technical Specifications for Peach Bottom Atomic Power Station, Units 2 and 3 were issued. This improved data base is a limited part of the changes involved in the request to modify the MAPLHGR curves based on GEGAP III.

Evaluation

The staff has recalculated the fuel temperature response to the design basis loss-of-coolant accident for Peach Bottom Atomic Power Station, Unit 2 and has determined new MAPLHGR curves for the three fuel types presently in use.

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The 2300°F peak clad temperature of these curves (Figure 3.5.1.A of the revised Technical Specifications) maintain the Interim Acceptance Criteria (IAC) during a loss-of-coolant accident (LOCA) while allowing steady state power operation at higher average planar linear heat generation rates.

In performing their calculations the staff used the same evaluation methods previously used in development of the present Technical Specifications but which have been refined to more accurately reflect the actual physical conditions within the fuel. When the MAPLHGR curves for the present Technical Specifications were prepared, the staff adopted an excessively conservative posture regarding time dependent densification and pellet-cladding gap closure due to pellet relocation. The staff recognized, at that time, that gpp closure would occur due to pellet cracking and that the evidence for this phenomenon was persuasive. But no consideration was given to this factor in the original limiting conditions for operation for the Peach Bottom facility.

The staff's current calculation modifies the previously performed calculation by incorporating pellet densification based on actual fuel burnup and a reasonable gap closure due to pellet cracking and relocation. Of the two effects gap closure is the dominant effect. For constant operating conditions, the consideration of fuel pellet-clad gap closure increases the calculated theremal conductance for the gap, reduces the calculated fuel pellet stored energy and reduces the calculated peak clod temperature following a LOCA. Conversely for a constant calculated post-LOCA peak cäad temperature the MAPLHGR can be increased when gap closure due to pellet cracking and relocation is considered.

The recalculated MAPLHGR values using previously used calculational methods, maintain calculated peak clad temperatures within the limitations of the IAC and consequently provide assurance of adequate ECCS performance in the event of a LOCA. The changes do not increase the probability or consequences of any accidents previously considered or do not significantly affect safety margins.

On August 5, 1974, Philadelphia Electric Company submitted an Emergency Core Cooling System (ECCS) evaluation and proposed changes to the Technical Specifications in accordance with 10 CFR Part 50, Section 50.46. Upon submittal of the ECCS and proposed Technical Specifications, 10 CFR Part 50, Section 50.46(a)(2)(iv) required that the facility shall be operated within the limits of both the proposed and approved Technical Specifications. In order to satisfy 10 CFR Part 50, Section 50.46, operation shall therefore be within the limits and restrictions of both this Technical Specification change and the proposed Technical Specifications submitted on August 5, 1974, unless modified by the Director of Regulation pursuant to 10 CFR 50.46(a)(2)(v).

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the change does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the change does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) 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.

Original Signed

D. M. Elliott
Operating Reactors Branch #3
Directorate of Licensing

Original Signed

George Lear, Chief
Operating Reactors Branch #3
Directorate of Licensing

Date: OCT 16 1974

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UNITED STATES ATOMIC ENERGY COMMISSION

DOCKET NO. 50-277

PHILADELPHIA ELECTRIC COMPANY

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY

OPERATING LICENSE

Notice is hereby given that the U. S. Atomic Energy Commission (the Commission) has issued Amendment No. 4 to Facility Operating License No. DPR-44 issued to Philadelphia Electric Company which revises the Technical Specifications for operation of the Peach Bottom Atomic Power Station, Unit No. 2 located in Peach Bottom, York County, Pennsylvania. The amendment is effective as of its date of issuance.

The amendment permits operation with revised maximum average planar linear heat generation rate curves up to an average planar exposure of 9,000 MWD/T.

The application for the amendment complies 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 amendment.

For further details with respect to this action, see (I) the application for amendment dated July 12, 1974, (2) Amendment No. 4 to License No. DPR-44, with Change No. 5, and (3) the Commission's related

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Safety Evaluation. 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 the Martin Memorial Library, 159 E. Market Street, York, Pennsylvania 17401.

A notice of a related proposed change in Technical Specifications was recently published in the Federal Register.

A copy of items (2) and (3) may be obtained upon request addressed to the U. S. Atomic Energy Commission, Washington, D. C. 20545, Attention: Deputy Director for Reactor Projects, Directorate of Licensing - Regulation.

Dated at Bethesda, Maryland, this 16th day of October, 1974.

FOR THE ATOMIC ENERGY COMMISSION

Original Signed

George Lear, Chief
Operating Reactors Branch #3
Directorate of Licensing

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SURNAME ➤						
DATE ➤						