

BEFORE THE

UNITED STATES NUCLEAR REGULATORY COMMISSION

In the Matter of :
PHILADELPHIA ELECTRIC COMPANY : Docket No. 50-278

APPLICATION FOR AMENDMENT
OF
FACILITY OPERATING LICENSE
DPR-56

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142f; and (c) removing page 140d due to a reduction of material. The revisions are needed for the next fuel cycle (cycle 8).

This Amendment will make the following pages in the Peach Bottom Unit 3 Technical Specifications identical to the same pages in the current Unit 2 Technical Specifications: 1, 11, 13, 15, 16, 17, 18, 133b, 140 and 140b.

This Application consists of three categories of changes. Category I involves the operating limits for all fuel types for Cycle 8 operation, and associated operational restraints. This category of changes concerns thermal-hydraulic considerations to ensure reactor safety. Category II is to decrease the slope of the Average Power Range Monitor scram and rod block setpoints. Category III is administrative changes, primarily to the Bases.

DISCUSSION OF PROPOSED CATEGORY I REVISIONS:

Changes to the Technical Specifications are being requested to specify the operating limits for all fuel types for Cycle 8 operation, including upgrading the Safety Limit Minimum Critical Power Ratio (MCPR). Licensee also proposes to add an operating restriction by limiting the Rod Block Monitor (RBM) rod block trip setting to a maximum of 107% to ensure that reactor operation is within the bounds of the analyses presented in General Electric Company Document No. 23A5889, "Supplemental

Relcad Licensing Submittal for Peach Bottom Atomic Power Station Unit 3, Reload 7, Cycle 8," dated January 1988, which is filed herewith and incorporated herein by reference. The proposed changes are indicated by a vertical bar in the page margins (or by the substitution of new figures). The Category I changes are summarized below.

<u>Page</u>	<u>Change</u>
9	Change MCPR from 1.07 to 1.04 for two loop operation and from 1.08 to 1.05 for single loop operation.
73	Add 107% RBM rod block trip limit.
10, 11a, 40, 74	Specify Limiting Power Density for new fuel.
133a	Revise LCO to address APLHGRs for multiple lattice fuel; specify MAPLHGR Reduction Factors for new fuel; specify Limiting Power Density for new fuel.
133c	Revise constants (μ and σ) used to calculate adjusted analysis mean scram time.

<u>Page</u>	<u>Change</u>
133d, 133e	Specify MCPRs for new fuel (standard and increased core flow conditions)
142, 142a	MCPR vs τ figure for new fuel.
142e, 142f	MAPLHGR vs Exposure figure for new multiple lattice fuel.

SAFETY ASSESSMENT FOR CATEGORY I REVISIONS:

The proposed changes on Page 9 revise the Safety Limit MCPR in accordance with Amendment 14 to the General Electric Standard Application for Reactor Fuel which was approved by the NRC in the letter from Ashok C. Thadani (NRC) to J. S. Charnley (GE), "Acceptance for Referencing of Amendment 14 to General Electric Licensing Topical Report NEDE-24011-P-A, 'General Electric Standard Application for Reactor Fuel'", dated December 27, 1987.

New fuel type, GE8X8EB, is planned for Cycle 8 operation. Proposed changes on Pages 133d, 133e, 142, and 142a identify the MCPR operating limits for the Cycle 8 fuel. An analysis of the safety considerations involved in the reactor refueling and the Cycle 8 MCPR operating limits for all fuel types is set forth in General Electric Company Document No. 23A5889, "Supplemental Reload Licensing Submittal for Peach

Bottom Atomic Power Station Unit 3, Reload 7, Cycle 8," previously referenced.

The proposed changes to the constants used to calculate the adjusted analysis mean scram time on Page 133c conform to Amendment 11 to the General Electric Company Standard Application for Reactor Fuel which was approved by the NRC in the letter from G. C. Lainas (NRC) to J. S. Charnley (GE), "Acceptance for Referencing of Licensing Topical Report, NEDE-24011-P-A, 'GE General Licensing Reload Report', Supplement to Amendment 11", dated March 22, 1986.

The proposed change to page 73 which would add a restriction on the flow biased RBM setpoint (107% maximum), ensures that increased core flow operations are within the bounds of the Rod Withdrawal Error analysis set forth in General Electric Company Document No. 23A5889. This restriction was incorporated into the Unit 2 Technical Specifications by Amendment No. 123, issued September 11, 1987.

The proposed changes incorporate the limiting power density of 14.4 kw/ft for GE8X8EB fuel on Pages 10, 11a, 40, 74 and 133a, the single-loop Maximum Average Planer Linear Heat Generation Rate (MAPLHGR) reduction factor of 0.73 for GE8X8EB fuel on Page 133a; and curves of the most and least limiting MAPLHGR versus planar average exposure for GE8X8EB fuel presented on Pages 142e and 142f, and referred to on Page 133a. Licensee also proposes to revise LCO 3.5.I on page 133a to address APLHGR limits for the new multiple lattice fuel types. LCO 3.5.I has

been revised to be identical with the Unit 2 Technical Specification as amended by Amendment No. 123. This change ensures that conservative limits are applied when the process computer is not operable. The results of a safety analysis for these APLHGR limits is set forth in: 1) General Electric Company Document NEDO-24082, "LOCA Analysis for Peach Bottom Atomic Power Station Unit 3", Errata and Addenda Sheet No. 7, dated January, 1988, which is filed herewith and incorporated herein by reference and 2) General Electric Company Document NEDE-24082-P-1, Revision 1, "Loss-of-Coolant Accident Analysis for Peach Bottom Atomic Power Station Unit 3, Supplement 1", dated January 1988 (which provides the specific APJHGR limits as well as bundle descriptions for the GE8X8EB fuel to be loaded for Cycle 8), which is filed herewith and incorporated herein by reference.

General Electric Company has advised Licensee that the latter document (NEDE-24082-P-1) contains information that it considers confidential and proprietary. Accordingly, the Licensee hereby requests that this document be withheld from public disclosure in accordance with the provisions of Section 2.790 of the Commission's Regulations. An executed affidavit of General Electric Company setting forth the grounds to support this request is filed herewith.

SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION FOR CATEGORY I

REVISIONS:

The NRC has provided guidance concerning the application of the standards for determining whether license amendments involve significant hazards considerations. An example (51 FR 7751, example iii) of a change that involves no significant hazards consideration is a change relating to a nuclear reactor core reloading, if there are no significant changes to the acceptance criteria for the Technical Specifications; the analytical methods used to demonstrate conformance with the Technical Specifications and regulations are not significantly changed; and the NRC has previously found such methods acceptable.

The proposed revisions incorporate changes to the operating limits resulting from Reload 7, and the new fuel assemblies have already been found acceptable by the NRC. The NRC has previously approved GE8X8EB fuel generically as documented by letter, C. O. Thomas (NRC) to J. S. Charnley (GE), "Acceptance for Referencing of Licensing Topical Report NEDE-24011-P-A-6, Amendment 10, 'General Electric Standard Application for Reactor Fuel'", dated May 28, 1985 and by letter, H. N. Berkow (NRC) to J. S. Charnley (GE), "Acceptance for Approval of Fuel Designs Described in Licensing Topical Report NEDE-24011-P-A-6, Amendment 10 for Extended Burnup Operation", dated December 3, 1985. The NRC has also previously approved the application of GEMINI analysis methods, used in Document No.

23A5889, to reload licensing as documented by letter, G. C. Lainas (NRC) to J. S. Charnley (GE), "Acceptance for Referencing of Licensing Topical Report NEDE-24011-P-A, 'GE Generic Licensing Reload Report', Supplement to Amendment 11", dated March 22, 1986.

The Category I changes consist of six items (A through F) and separate Significant Hazards Consideration Determinations are provided below for each item.

A. Upgraded Safety Limit MCPR

- i) The proposed revisions do not involve a significant increase in the probability or consequences of an accident previously evaluated.

The Safety Limit MCPR is set such that no fuel damage is calculated to occur if the limit is not violated. It is determined using the NRC approved General Electric Thermal Analysis Basis (GETAB), which is a statistical model that combines uncertainties in operating parameters with uncertainties in the methods used to calculate critical power.

Upgrading the Safety Limit MCPR to 1.04 (1.05 for single recirculation loop operation) has been approved by the NRC for application to D-lattice plants operating with the second successive reload core of

high bundle R-factor fuel types. This determination applies to Unit 3 since it is a D-lattice plant and all fuel types to be loaded for Cycle 8 operation (BP/P8X8R, LTA and GE8X8EB) are high bundle R-factor fuel types.

Because the new Safety Limit MCPR is set such that no fuel damage is calculated to occur and thereby accomplishes the same purpose as the previous limit, this change does not increase the probability or consequences of any accident previously evaluated.

- ii) The proposed revisions do not create the possibility of a new or different kind of accident from any accident previously evaluated.

Because the Safety Limit MCPR cannot initiate an accident and imposing the new limit requires no changes in the current mode of operation, this change does not create the possibility of a new or different kind of accident than previously evaluated.

- iii) The proposed revisions do not involve a significant reduction in a margin of safety.

Upgrading the Safety Limit MCPR maintains the margin of safety established by the current limit. Both limits have received previous NRC approval in

NEDE-24011-P-A. Thus, this change does not involve a significant reduction in the margin of safety.

B. GE8X8EB MAPLHGRs

- i) The proposed revisions do not involve a significant increase in the probability or consequences of an accident previously evaluated.

10CFR50.46 establishes acceptance criteria for fuel and Emergency Core Cooling Systems (ECCS). MAPLHGR limits are established to ensure that the acceptance criteria are met.

This change provides MAPLHGR limits for the BD319A and BD321A (GE8X8EB) fuel assemblies. The MAPLHGRs have been calculated using NRC approved methods and the results of the analysis (General Electric Company Document NEDE-24082-P-1, previously referenced) demonstrate that the acceptance criteria of 10CFR50.46 are met with substantial margin. This change therefore does not increase the probability or consequences of an accident previously evaluated (LOCA).

- ii) The proposed revisions do not create the possibility of a new or different kind of accident from any accident previously evaluated.

Because MAPLHGR limits can not initiate an accident and imposing the limits does not require any changes to the current mode of operation, this change does not create the possibility of a new or different kind of accident than previously evaluated.

- iii) The proposed revisions do not involve a significant reduction in a margin of safety.

The acceptance criteria of 10CFR50.46 establish the margins of safety for fuel and the ECCS. Calculations using NRC approved methods described in NEDE-24082-P-1 yield results well within these acceptance criteria. The maximum peak cladding temperature (PCT) for GE8X8EB fuel assemblies is evaluated to be ≤ 2089 F for a bounding value of MAPLHGR = 14.0 kw/ft, providing 111 F margin to the 2200 F limit. The actual MAPLHGR operating limits for the BD319A and BD321A fuel assemblies are ≤ 13.2 kw/ft, which results in a PCT for those fuels of ≤ 1980 F. Since the maximum PCT for previous reloads of P8X8R fuel is 1954 F, the proposed amendment does not result in a reduction in the margin of safety.

C. Constants Used to Determine τ

- i) The proposed revisions do not involve a significant increase in the probability or consequences of an accident previously evaluated.

The constants used to calculate the adjusted analysis mean scram time (τ) are the mean and standard deviation of the scram speed data base used in the determination of NRC approved MCPR adjustment factors. These new constants result in the calculation of a smaller and therefore more restrictive τ . Plants unable to meet the τ criterion must increase their operating limit MCPR. Plants that meet the τ criterion operate with a MCPR limit defined in the Technical Specifications.

In summary, the MCPR operating limit is set such that fuel damage is not calculated to occur during a transient. The criterion is applied to verify that the limit is appropriate. Since the new constants result in a more restrictive τ , this change does not involve an increase in the probability or consequences of an accident previously evaluated.

- ii) The proposed revisions do not create the possibility of a new or different kind of accident from any accident previously evaluated.

Based on the definition of τ , τ cannot initiate an accident, and establishing τ does not require any changes to the current mode of operation; thus, this change does not create the possibility of a new or different kind of accident than previously evaluated.

- iii) The proposed revisions do not involve a significant reduction in a margin of safety.

The change in the constants used to calculate τ , results in a more restrictive criterion for applying the appropriate MCPD operating limit. The margin of safety is provided by the MCPD limit, which is increased if the τ criterion is not met. Therefore, this change does not result in a reduction in the margin of safety.

D. LHGR Limit for GE8X8EB Fuel

- i) The proposed revisions do not involve a significant increase in the probability or consequences of an accident previously evaluated.

In NUREG-0800, "Standard Review Plan for 4.2, Fuel System Design, Revision 2, July, 1981, the NRC provides acceptance criteria for fuel designs under accident conditions. Evaluations of the GE8X8EB design with the higher (14.4 kw/ft) LHGR limit using NRC approved methods described in NEDE-24011-P-A have been performed. The results of these evaluations are documented in NEDE-24011-P-A, and demonstrate that the NRC acceptance criteria are met with the higher LHGR limit. Because the acceptance criteria in NUREG-800 are all met, the proposed change does not increase the probability or consequences of an accident previously evaluated.

- ii) The proposed revisions do not create the possibility of a new or different kind of accident from any accident previously evaluated.

Because the LHGR limit cannot initiate an accident, and imposing LHGR limits does not require any changes in the mode of operation, the possibility of a new or different kind of accident than previously evaluated is not created.

- iii) The proposed revisions do not involve a significant reduction in a margin of safety.

The margin of safety is defined by the NRC acceptance criteria of NUREG-0800. The NRC has reviewed and approved General Electric evaluations demonstrating that the GE8X8EB design is within the acceptance criteria with a LHGR of 14.4 kw/ft. Therefore, the proposed amendment does not involve a reduction in the margin of safety.

E. New Operating Limit MCPRs

- i) The proposed revisions do not involve a significant increase in the probability or consequences of an accident previously evaluated.

The operating limit MCPR is set such that the safety limit MCPR cannot be violated in the unlikely event of a transient. The operating limit MCPR is determined by adding the delta-CPR for the worst transient to the safety limit MCPR. The transient delta-CPR is calculated using NRC approved methods described in NEDE-24011-P-A. The limiting abnormal operational transients have been re-evaluated in detail for standard conditions: generator load rejection without bypass, loss of 100 degrees F feedwater heating, rod withdrawal error and feedwater controller failure. The limiting abnormal operational transients, generator load rejection without bypass and feedwater

controller failure, were re-evaluated in detail for operation at Increased Core Flow with or without Final Feedwater Temperature Reduction. The feedwater controller failure transient was also re-evaluated in detail for operation in the Extended Load Line Limit Analysis region. The Cycle 8 operating limits are based on the results given in General Electric Document No. 23A5889, previously referenced.

Operation above these limits means that no fuel damage is calculated to occur in the event of a transient. Since Cycle 8 operating limits accomplish the same purpose as the previous limits, this change does not increase the probability or consequences of an accident previously evaluated.

- ii) The proposed revisions do not create the possibility of a new or different kind of accident from any accident previously evaluated.

Because the operating limit MCPR cannot initiate an accident and imposing the MCPR limit does not require a change in the current mode of operation, the possibility of a new or different kind of accident than previously evaluated is not created.

- iii) The proposed revisions do not involve a significant reduction in a margin of safety.

The operating limit MCPR is set to prevent calculated fuel damage during the worst transient. The delta-CPR for the worst transient is determined using NRC approved methods and procedures described in NEDE-24011-P-A. Margin is included in the delta-CPR for the worst transient by assuming conservative input parameters and by conservatively treating uncertainties. Margin is also included in the determination of the safety limit MCPR.

Changing the operating limit MCPR does not reduce the margin of safety included in the delta-CPR and safety limit MCPR calculations.

F. RBM 107% Clamp

- i) The proposed revisions do not involve a significant increase in the probability or consequences of an accident previously evaluated.

The rod withdrawal error analysis results reported for standard operating conditions in General Electric Document No. 23A5889 are not affected by operation at Increased Core Flow, assuming that the RBM is clamped at 107%. Previously, this operating restriction (RBM clamped at 107% prior to Increased Core Flow operation) has been imposed by procedure. Adding this

restriction to the Technical Specifications provides more assurance of safe operation and, therefore this change does not increase the probability or consequences of an accident previously evaluated.

- ii) The proposed revisions do not create the possibility of a new or different kind of accident from any accident previously evaluated.

Clamping the RBM setpoint impacts only the rod withdrawal error analysis which is set forth in General Electric Document No. 23A5889; thus, the possibility of a new or different kind of accident is not created.

- iii) The proposed revisions do not involve a significant reduction in a margin of safety.

The rod withdrawal error analysis results reported in General Electric Document No. 23A5889 assume the RBM setpoint is clamped at 107%. Since this proposed revision specifies this restriction in the Technical Specifications, greater assurance will be provided that there will be no reduction in a margin of safety.

DISCUSSION OF PROPOSED CATEGORY II REVISIONS:

Licensee proposes to change the slope of the flow biased Average Power Range Monitor (APRM) scram and rod block setpoints from 0.66 to 0.58 (on pages 9, 9A, 10, 11, 11a, 16, 37, 40, 73 and 74) to provide increased operating flexibility during power ascension. The proposed changes are indicated by a vertical bar in the page margins (or by the substitution of new figures).

SAFETY ASSESSMENT FOR CATEGORY II REVISIONS:

An analysis of the safety considerations involved in this change is set forth in General Electric Company Document No. 23A5889, previously referenced, which concluded that operation with a slope of 0.58 (operation in extended load line limit analysis region) is within allowable design limits. This safety analysis refers to analyses to support operation in the extended load line limit analysis region set forth in General Electric Document NEDC-31298, "General Electric Boiling Water Reactor Extended Load Line Limit Analysis for Peach Bottom Unit 2, Cycle 7 and Peach Bottom Unit 3, Cycle 7", dated May 1986, which was previously filed to support Amendment No. 123 (issued September 11, 1987) to Facility Operating License No. DPR-44 for Peach Bottom Atomic Power Station, Unit 2 and is incorporated herein by reference.

SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION FOR CATEGORY II

REVISIONS:

The NRC has provided guidance concerning the application of the standards for determining whether license amendments involve significant hazards considerations by providing examples (51 FR 7751). An example (iv) of a change that involves no significant hazards consideration is "a relief granted upon demonstration of acceptable operation from an operating restriction that was imposed because acceptable operation was not yet demonstrated."

These proposed revisions fit this example since the effect of the change in slope of the flow biased APRM scram and rod block setpoints is to provide a slightly increased extended load line analysis region, operation in which is justified by analyses documented in NEDC-31298 and confirmed in Document No. 235889.

It has been determined, based on the following reasons, that the proposed revisions do not involve significant hazards considerations.

- i) The proposed revisions do not involve a significant increase in the probability or consequences of an accident previously evaluated.

The change in APRM scram and rod block setpoint equations was evaluated using NRC approved procedures and methods. The results of this evaluation are demonstrated in NEDC-31298, previously referenced. Application of this change in APRM scram and rod block setpoint equations to Cycle 8 is confirmed in General Electric Document No. 23A5889, previously referenced.

In NEDC-31298, the impact of the new APRM scram and rod block equations on overpressure protection, stability, loss of coolant accident, containment, reactor internals, and anticipated transients without scram (ATWS) events was evaluated. The results of these evaluations demonstrate that all design limits identified in the FSAR are met.

Because operation with the APRM scram and rod block setpoint equation is well within the bases reviewed and approved by the NRC in the FSAR, this change does not increase the probability or consequences of an accident previously evaluated.

- ii) The proposed revisions do not create the possibility of a new or different kind of accident from any accident previously evaluated.

The impact of changing the APRM scram and rod block setpoint equations has been considered for all transients and accidents identified in the FSAR. The possibility of a new or different kind of accident from any accident previously evaluated is not created.

- iii) The proposed revisions do not involve a significant reduction in a margin of safety.

NEDC-31298 demonstrates that the change in slope of the APRM scram and rod block setpoint equations is within the limits identified in the FSAR. Analyses documented in General Electric Company Document No. 23A5889 confirm that the operating limit MCPs set forth in General Electric Company Document No. 23A5889 bound operation with the new equations. Thus, a margin of safety is not significantly reduced.

DISCUSSION OF PROPOSED CATEGORY III REVISIONS:

Administrative changes are requested to 1) add the definition of APLHGR on Page 1; 2) modify the Bases on Pages 13 and 15 to include reference to "Peach Bottom Atomic Power Station Units 2 and 3 Single-Loop Operation", NEDO-24229-1, May 1980; 3) modify the Bases on Page 140 to incorporate a new paragraph regarding APLHGR operating limits for multiple lattice fuel types; 4) modify the Bases on Pages 15, 17, 18, 33, 140b, 140c and 140d to eliminate redundant information that is subject to

periodic revision due to amendment of "General Electric Standard Application for Reactor Fuel", NEDE-24011-P-A. These proposed changes are similar to those previously approved for Peach Bottom Unit 2, Cycle 8. Page 140d is deleted due to a reduction of material.

Licensee also proposes to delete the MAPLHGR reduction factors for 7X7, 8X8, PTA and 8X8R fuel types from page 133a because these fuel types will not be used in the Cycle 8 core, and to correct a typographical error on page 133b. Specification 3.5.K is incorrectly identified on page 133b as 3.5.K.1.

The proposed changes are indicated by a vertical bar in the page margins.

SAFETY ASSESSMENT FOR CATEGORY III REVISIONS:

The proposed administrative changes will not affect plant operations. The proposed changes merely delete unnecessary information, modify supporting information in the Bases or add supporting information to the Bases to clarify the Technical Specifications. The only Category III changes to the Limiting Conditions for Operation are the removal of the MAPLHGR reduction factors for fuel types not being used in Cycle 8 and the correction of the typographical error on page 133b. The remainder of the Category III changes are in the Bases and Definitions.

SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION FOR CATEGORY

III REVISIONS:

The NRC has provided guidance concerning the application of the standards for determining whether license amendments involve significant hazards considerations by providing examples (51 FR 7751). An example (i) of a change that involves no significant hazards considerations is "a purely administrative change to technical specifications: for example, a change to achieve consistency throughout the technical specifications, correction of an error, or a change in nomenclature".

The proposed revisions are purely administrative because they do not add, delete or modify any operating restrictions that are relevant to Cycle 8 operation as discussed above.

It has been determined, based on the following reasons, that the proposed revisions do not involve significant hazards considerations.

- i) The proposed revisions do not involve a significant increase in the probability or consequences of an accident previously evaluated because they do not affect operations, plant equipment, or any safety-related activity. Thus, the administrative changes cannot affect the probability or consequences of any accident.

- ii) The proposed revisions do not create the possibility of a new or different kind of accident from any accident previously evaluated because, as discussed previously, these changes are purely administrative and, therefore, can not create the possibility of any accident.

- iii) The proposed revisions do not involve a significant reduction in a margin of safety because the changes do not affect any safety-related activity or equipment. These changes are purely administrative in nature and increase the probability that the Technical Specifications are correctly interpreted by adding clarifying information and deleting inappropriate information. Thus, these changes cannot reduce a margin of safety.

Environmental Impact:

An environmental impact assessment is not required for the changes requested by this Application because the requested changes conform to the criteria for "actions eligible for categorical exclusion" as specified in 10 CFR 51.22(c)(9). The requested changes are typical of past reload amendments which the Commission has judged not to require an environmental impact assessment. The Application involves no significant hazards consideration as demonstrated in the preceding sections. The Application involves no significant change in the types or

significant increase in the amounts of any effluents that may be released offsite, and there is no significant increase in individual or cumulative occupational radiation exposure.

Conclusion:

The Plant Operating Review Committee and the Nuclear Review Board have reviewed these proposed changes to the Technical Specifications and have concluded that they do not involve an unreviewed safety question or a significant hazards consideration and will not endanger the health and safety of the public.

Respectfully submitted,

By *John Ballinger*
Vice President

COMMONWEALTH OF PENNSYLVANIA :
 : SS.
COUNTY OF PHILADELPHIA :

J. W. Gallagher, being first duly sworn, deposes and says:

That he is Vice President of Philadelphia Electric Company, the Applicant herein; that he has read the foregoing Application for Amendment of Facility Operating License DFR-56 and knows the contents thereof; and that the statements and matters set forth therein are true and correct to the best of his knowledge, information and belief.

Jan. Gallagher
Vice President

Subscribed and sworn to
before me this 1st day
of July, 1988

Judith Y. Franklin
Notary Public

JUDITH Y. FRANKLIN
Notary Public, Phila., Phila. Co.
My Commission Expires July 28, 1991