

PHILADELPHIA ELECTRIC COMPANY

NUCLEAR GROUP HEADQUARTERS

355-65 CHESTERBROOK BLVD.

WAYNE, PA 19087-5691

(215) 640-6000

March 12, 1991

Docket No. 50-353

License No. NPF-85

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

SUBJECT: Limerick Generating Station, Unit 2
Technical Specifications Change Request

Gentlemen:

Philadelphia Electric Company is submitting Technical Specifications Change Request No. 90-16-2, in accordance with 10 CFR 50.90, requesting an amendment to the Technical Specifications (TS) (Appendix A) of Operating License No. NPF-85. Information supporting this Change Request is contained in Attachment 1 to this letter, and the proposed TS replacement pages are contained in Attachment 2.

This submittal requests changes to TS Sections 2.1.2, 3.2.1, 3.2.3, and the pertinent TS Bases to reflect changes to the Minimum Critical Power Ratio (MCPR) Safety Limit as a result of changes in reload fuel type and to reflect the revised computer methods used to calculate thermal limits.

If you have any questions regarding this matter, please contact us.

Very truly yours,



G. J. Beck
Manager, Licensing
Nuclear Engineering and Services

GHS/eas:3033

Attachments

cc: T. T. Martin, Administrator, Region I, USNRC
T. J. Kenny, USNRC Senior Resident Inspector, LGS
T. M. Gerusky, Director, PA Bureau of Radiological Protection

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COMMONWEALTH OF PENNSYLVANIA :
: ss.
COUNTY OF PHILADELPHIA :

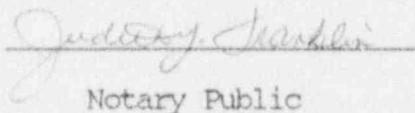
G. M. Leitch, being first duly sworn, deposes and says:

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 No. NPF-85 (Technical Specifications Change Request No. 90-16-2) to reflect changes to the Minimum Critical Power Ratio (MCPR) Safety Limit as a result of changes in reload fuel type and to reflect the revised computer methods used to calculate thermal limits, 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.

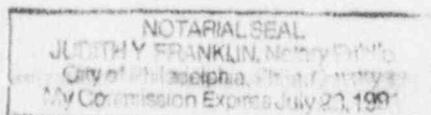


Vice President

Subscribed and sworn to
before me this 12th day
of MARCH 1991.



Notary Public



ATTACHMENT 1

LIMERICK GENERATING STATION
Unit 2

Docket No. 50-353

License No. NPF-85

TECHNICAL SPECIFICATIONS CHANGE REQUEST

"Minimum Critical Power Ratio Safety Limit/Revised Calculational Methods Changes"

Supporting Information for Changes - 6 pages

Philadelphia Electric Company (PECO), Licensee under Facility Operating License NPF-85 for Limerick Generating Station (LGS), Unit 2, requests that the Technical Specifications (TS) contained in Appendix A of the Operating License be amended as proposed herein to reflect changes to the Minimum Critical Power Ratio (MCPR) Safety Limit as a result of changes in reload fuel type and to reflect the revised computer methods used to calculate thermal limits as previously approved by the NRC. The proposed TS changes are indicated by a vertical bar in the margin of TS pages xviii, 2-1, 3/4 2-1, and 3/4 2-8, and Bases pages B 2-1, B 3/4 2-1, B 3/4 2-2, B 3/4 2-3, and B 3/4 2-5 for LGS, Unit 2, and are contained in Attachment 2.

We request the changes proposed herein be effective upon issuance of the Amendment.

This Change Request provides a discussion and description of the proposed TS changes, a safety assessment of the proposed TS changes, information supporting a finding of No Significant Hazards Consideration, and information supporting an Environmental Assessment.

Discussion and Description of the Proposed Changes

Implementation of this Change Request involves the proposed TS changes described below.

The first proposed TS change would revise the current MCPR Safety Limit of 1.06 to a new limit of 1.07 for two recirculation loop operation (1.07 to 1.08 for single recirculation loop operation). This increased limit would provide additional conservatism to account for possible uncertainties in power distribution in reload reactor cores. The proposed MCPR Safety Limit is in accordance with Revision 9 of "General Electric Standard Application for Reactor Fuel," (GESTAR-II), NEDE-24011-P-A-9, September 1988 (Reference 1) and was approved by the NRC in a letter from Ashok C. Thadani (NRC) to J. S. Charnley (GE), "Acceptance for Referencing of Amendment 18 to General Electric Licensing Topical Report NEDE-24011-P-A-9, 'General Electric Standard Application for Reactor Fuel'," dated May 12, 1988 (Reference 4).

The second proposed TS change would substitute new computer methods (i.e., GEMINI/ODYN) for the current computer methods (i.e., GENESIS/ODYN) as the basis for calculating thermal limits. TS changes to reflect the GEMINI/ODYN computer methods and multiple lattice fuel are proposed to the Average Planar Linear Heat Generation Rate (APLHGR) Bases Section 3/4.2.1, the APLHGR Limiting Condition for Operation (LCO) 3.2.1, and the MCPR LCO 3.2.3. These changes are proposed in accordance with Revision 9 to GESTAR-II and were approved by the NRC in References 5 and 7. These proposed changes are identical to the current LGS Unit 1 TS as previously approved for Unit 1 by the NRC (see Reference 6).

Below is a discussion of the proposed TS changes.

MCPR SAFETY LIMIT

The fuel cladding integrity safety limit is set such that no fuel damage is calculated to occur if the limit is not violated. Since the parameters which result in fuel damage are not directly observable during reactor operation, the thermal hydraulic conditions resulting in a departure from nucleate boiling have been used to mark the beginning of the region where fuel damage could occur. Although it is recognized that a departure from nucleate boiling would not necessarily result in damage to Boiling Water Reactor (BWR) fuel rods, the critical power at which boiling transition is calculated to occur has been adopted as a convenient limit. However, the uncertainties in monitoring the core operating state and in the procedure used to calculate the critical power result in an uncertainty in the value of critical power. Therefore, the fuel cladding integrity safety limit (i.e., the MCPR Safety Limit) is defined as the critical power ratio on the limiting fuel assembly for which more than 99.9% of the fuel rods in the core are expected to avoid boiling transition considering the power distribution within the core and all uncertainties.

The MCPR Safety Limit is determined using the NRC approved General Electric Thermal Analysis Basis (GETAB) described in References 1 and 2 for two recirculation loop operation. The MCPR Safety Limit is increased by 0.01 for single recirculation loop operation as discussed in Reference 3.

A MCPR Safety Limit of 1.07 for two recirculation loop operation (1.08 for single recirculation loop operation) has been previously approved by the NRC for application to C-lattice plants operating with a reload reactor core of GE8x8NB (i.e., GE9B) fuel (see Reference 1, Table 4-2). LGS Unit 2 is a C-lattice plant and the reload fuel for the second cycle of operation will be GE9B fuel, with the exception of twelve Qualification Fuel Bundles (QFBs). However, these QFBs will be loaded in non-limiting locations as described in our letter to the NRC dated March 11, 1991, such that the QFBs will have an insignificant impact on the core wide MCPR Safety Limit.

GEMINI/ODYN COMPUTER METHODS

Amendment 11 to GESTAR-II revises the document to include an updated version of the OLYN computer code among the calculational techniques used for plant transient analyses and updates the manner in which calculational uncertainties are treated in obtaining core operating limits. This new approach is the GEMINI/ODYN computer methodology and is similar to the previously approved GENESIS/ODYN computer methodology. The changes to the OLYN calculational model include:

1. improved neutronics methods,
2. inclusion of GESTR-M Fuel Performance Model,
3. improved Bulkwater Model
4. improved Upper Plenum Model, and
5. improved Steam Separator Mass Storage Model.

Data provided to the NRC on the results of comparisons of the old and new ODYN computer code calculations for the Peach Bottom Atomic Power Station turbine trip tests showed that the new ODYN results (i.e., GEMINI/ODYN) provide generally better agreement with the test data than did the old ODYN (i.e., GENESIS/ODYN) calculations. Due to the increased accuracy of the new ODYN calculations and a revised manner in which computer code uncertainties are handled in obtaining the Option A and Option B MCPR operating limits, the Statistical Adjustment Factors (SAFs) used in obtaining the MCPR operating limit 95/95 value (i.e., that value which assures a 95% probability with 95% confidence that the critical power will not fall below the MCPR Safety Limit) for pressurization events have changed. These SAFs result in improvements to the 95/95 MCPR operating limits while maintaining the same margin of safety.

A separate change that also affects the MCPR operating limit is an expansion of the database used for determining the scram speed distribution (i.e., used to derive the analytical control rod insertion time). This results in new values of the mean and standard deviation of the scram speed database. These values are used to determine the value of TAU as shown in proposed TS Section 3.2.3. The calculation of TAU is used to demonstrate that the LGS Unit 2 scram speed distribution is consistent with that used in the calculation of the 95/95 MCPR operating limit. If scram speed is not demonstrated by test to comply with that used in the 95/95 MCPR operating limit calculation, then a more conservative MCPR operating limit that does not include full credit for the statistically evaluated scram times must be used. The determination of the more conservative MCPR operating limit is done in the same way that it is currently done with the exception of the new values for the mean and standard deviation of the scram speed database.

Changes in the wording in the TS Bases and the TS LCO for the APLHGR and in the TS LCO for MCPR is also being proposed. These proposed TS changes are administrative in nature and reflect the GEMINI/ODYN computer methods and multiple lattice fuel.

Safety Assessment

The MCPR Safety Limit is set such that no fuel damage is calculated to occur if the limit is not violated. LGS Unit 2 is a C-lattice plant and the reload fuel for the second cycle of operation will be GE9B fuel. The proposed MCPR Safety Limit was determined using NRC approved methodology for C-lattice plants operating with GE9B reload fuel. The use of this methodology ensures that the proposed MCPR Safety Limit maintains the same level of conservatism regarding calculational uncertainties, and therefore, the same margin of safety as that for the current fuel. Operation of the plant based on the proposed MCPR Safety Limit will ensure that fuel cladding integrity is maintained. The proposed changes to the APLHGR TS Bases, APLHGR TS LCO, and MCPR TS LCO reflect the use of this revised NRC approved methodology for calculating thermal limits, which ensures that the same level of conservatism is maintained. The proposed TS changes are to analytical values and methods, and do not physically affect the fuel. Additionally, the proposed TS changes do not alter the design or function of plant equipment, nor do they introduce any new operating scenarios, configurations, or failure modes.

Information Supporting a Finding of No Significant Hazards Consideration

We have concluded that the proposed changes to the LGS TS, which revise the MCPR Safety Limit to reflect the reload fuel type and the APLHGR LCO, MCPR LCO, and APLHGR Bases to reflect the revised methodology for calculating thermal limits, do not constitute a Significant Hazards Consideration. In support of this determination, an evaluation of each of the three standards set forth in 10 CFR 50.92 is provided below.

1. The proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed changes to the MCPR Safety Limit and the thermal limit calculational methods are changes to analytical values and methods, and, in themselves, cannot initiate an accident. The MCPR Safety Limit is set such that no fuel damage is calculated to occur if the limit is not violated and is determined based on the revised NRC approved methodology. The use of this methodology ensures that the same level of conservatism is maintained with respect to calculational uncertainties. Operation of the plant based on the proposed MCPR Safety Limit will ensure that fuel cladding integrity is maintained. Therefore, the proposed TS changes would not cause an increase in the probability or consequences of any accident previously evaluated.

2. The proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed TS changes are to analytical values and methods and do not physically affect the fuel, and therefore, in themselves, cannot initiate any accident or cause any type of fuel malfunction. The proposed TS changes do not alter the design or function of any plant equipment, nor do they introduce any new operating scenarios, configurations, or failure modes that would create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The proposed changes do not involve a significant reduction in a margin of safety.

The margin of safety is based upon the methods used to determine the MCPR Safety Limit and the other thermal limits. The proposed TS changes are to the value of the MCPR Safety Limit as determined by these methods and to the calculational methods themselves as reflected in the proposed APLHGR TS LCO and Bases, and the MCPR TS LCO. These changes have been reviewed and approved by the NRC and will maintain the same margin of safety.

Information Supporting an Environmental Assessment

An environmental assessment is not required for the changes proposed by this Change Request because the requested changes conform to the criteria for "actions eligible for categorical exclusion," as specified in 10CFR51.22(c)(9). The requested changes will have no impact on the environment. The requested changes do not involve a significant hazards consideration as discussed in the preceding section. The requested changes do not involve a significant change in the types or significant increase in the amounts of any effluents that may be released offsite. In addition, the proposed changes do not involve a significant increase in individual or cumulative occupational radiation exposure.

Conclusion

The Plant Operations Review Committee and the Nuclear Review Board have reviewed these proposed changes to the TS 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.

References

1. "General Electric Standard Application for Reactor Fuel," NEDE-24011-P-A-9, September 1988,
2. "General Electric BWR Thermal Analysis Basis (GETAB): Data, Correlation and Design Application," NEDO-10958-A, January 1977.
3. "Single Loop Operation Analysis for Limerick Generating Station Units 1," NEDC-31629P, September 1988.
4. Ashok C. Thadani (NRC) to J. S. Charnley (GE), "Acceptance for Referencing of Amendment 18 to General Electric Licensing Topical Report NEDE-24011-P-A-9, 'General Electric Standard Application for Reactor Fuel'," dated May 12, 1988.
5. 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.
6. Safety Evaluation by the Office of Nuclear Reactor Regulation, NRC, supporting Amendment No. 7 to Facility Operating License No. NPF-39, Philadelphia Electric Company, Limerick Generating Station, Unit 1, Docket No. 50-352, dated August 14, 1987.
7. Ashok C. Thadani (NRC) to J. S. Charnley (GE), "Acceptance for Referencing of Amendment 19 to General Electric Licensing Topical Report NEDE-24011-P-A-9, 'General Electric Standard Application for Reactor Fuel', dated April 7, 1987," November 17, 1987.