2.0 SAFETY LIMITS (SLs)

2.1 SLs

2.1.1 Reactor Core SLs

2.1.1.1 With the reactor steam dome pressure < 785 psig or core flow < 10% rated core flow:

THERMAL POWER shall be ≤ 25% RTP.

2.1.1.2 With the reactor steam dome pressure ≥ 785 psig and core flow ≥ 10% rated core flow:

MCPR shall be ≥ 1.07 for two recirculation loop operation or ≥ 1.08 for single recirculation loop operation.

2.1.1.3 Reactor vessel water level shall be greater than the top of active irradiated fuel.

2.1.2 Reactor Coolant System (RCS) Pressure SL

Reactor steam dome pressure shall be ≤ 1325 psig.

2.2 SL Violations

With any SL violation, the following actions shall be completed:

2.2.1 Within 1 hour, notify the NRC Operations Center, in accordance with 10 CFR 50.72.

2.2.2 Within 2 hours:

2.2.2.1 Restore compliance with all SLs; and

2.2.2.2 Insert all insertable control rods.

2.2.3 Within 24 hours, notify the plant manager, the corporate executive responsible for overall plant nuclear safety, and the offsite review committee.

(continued)

2.0 SAFETY LIMITS (SLs)

2.1 SLs

2.1.1 Reactor Core SLs

2.1.1.1 With the reactor steam dome pressure < 785 psig or core flow < 10% rated core flow:

THERMAL POWER shall be ≤ 25% RTP.

2.1.1.2 With the reactor steam dome pressure ≥ 785 psig and core flow ≥ 10% rated core flow:

MCPR shall be ≥ ~~1.12~~ 1.07 for two recirculation loop operation or ≥ ~~1.14~~ 1.08 for single recirculation loop operation.

2.1.1.3 Reactor vessel water level shall be greater than the top of active irradiated fuel.

2.1.2 Reactor Coolant System (RCS) Pressure SL

Reactor steam dome pressure shall be ≤ 1325 psig.

2.2 SL Violations

With any SL violation, the following actions shall be completed:

2.2.1 Within 1 hour, notify the NRC Operations Center, in accordance with 10 CFR 50.72.

2.2.2 Within 2 hours:

2.2.2.1 Restore compliance with all SLs; and

2.2.2.2 Insert all insertable control rods.

2.2.3 Within 24 hours, notify the plant manager, the corporate executive responsible for overall plant nuclear safety, and the offsite review committee.

(continued)

ATTACHMENT 1

Edwin I. Hatch Nuclear Plant - Unit 2
Request to Revise Technical Specifications:
Safety Limit Minimum Critical Power Ratios (SLMCPR)

Affidavit of Proprietary Information

GE Nuclear Energy

General Electric Company
P. O. Box 780, Wilmington, NC 28402

Affidavit

I, Glen A. Watford, being duly sworn, depose and state as follows:

(1) I am Manager, Nuclear Fuel Engineering, General Electric Company ("GE") and have been delegated the function of reviewing the information described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding.

(2) The information sought to be withheld is contained in the attachment, *Additional Information Regarding the Cycle Specific SLMCPR for Edwin I. Hatch Nuclear Plant Unit 2 Cycle 16, August 9, 1999.*

(3) In making this application for withholding of proprietary information of which it is the owner, GE relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4) and 2.790(a)(4) for "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (Exemption 4). The material for which exemption from disclosure is here sought is all "confidential commercial information," and some portions also qualify under the narrower definition of "trade secret," within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).

(4) Some examples of categories of information which fit into the definition of proprietary information are:

a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by General Electric's competitors without license from General Electric constitutes a competitive economic advantage over other companies;

b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;

c. Information which reveals cost or price information, production capacities, budget levels, or commercial strategies of General Electric, its customers, or its suppliers;

d. Information which reveals aspects of past, present, or future General Electric customer-funded development plans and programs, of potential commercial value to General Electric;

e. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in both paragraphs (4)a. and (4)b., above.

(5) The information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GE, and is in fact so held. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in (6) and (7) following. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by GE, no public disclosure has been made, and it is not available in public sources. All disclosures to third parties including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence.

(6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge. Access to such documents within GE is limited on a "need to know" basis.

(7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his delegate), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GE are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.

(8) The information identified in paragraph (2) is classified as proprietary because it contains details of GE's Safety Limit methodology and the corresponding results which GE has applied to actual core designs with GE's fuel.

The development of the methods used in these analyses, along with the testing, development and approval of the supporting methodology was achieved at a significant cost, on the order of several million dollars, to GE.

(9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GE's competitive position and foreclose or reduce the availability of profit–making opportunities. The Safety Limit analysis is part of GE's comprehensive BWR safety and technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC–approved methods.

The research, development, engineering, analytical, and NRC review costs comprise a substantial investment of time and money by GE.

The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

GE's competitive advantage will be lost if its competitors are able to use the results of the GE experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to GE would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive GE of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing these very valuable analytical tools.

State of North Carolina)
County of New Hanover) SS:

Glen A. Watford, being duly sworn, deposes and says:

That he has read the foregoing affidavit and the matters stated therein are true and correct to the best of his knowledge, information, and belief.

Executed at Wilmington, North Carolina, this 12th day of August, 1999

Glen A. Watford
General Electric Company

Subscribed and sworn before me this 12th day of August, 1999

Joan M. Anderson
Notary Public, State of North Carolina

My Commission Expires 10/08/2001

ATTACHMENT 2

Edwin I. Hatch Nuclear Plant - Unit 2
Request to Revise Technical Specifications:
Safety Limit Minimum Critical Power Ratios (SLMCPR)

Nonproprietary Version of the Basis for Change Request

Enclosure 1

Edwin I. Hatch Nuclear Plant - Unit 2
Request to Revise Technical Specifications:
Safety Limit Minimum Critical Power Ratios (SLMCPR)

Basis for Change Request

PROPOSED CHANGES

SNC requests that the Technical Specifications (TS) contained in Appendix A to the Plant Hatch Unit 2 Operating License NPF-5 be amended to revise Technical Specifications Section 2.1.1.2 to reflect changes in the Safety Limit Minimum Critical Power Ratios (SLMCPR), which are based on the application of GE's new, NRC-approved methodology for calculating SLMCPRs .

BACKGROUND

The proposed changes involve revising the SLMCPRs contained in Section 2.1.1.2 of the Plant Hatch Unit 2 TS. In the course of calculating a cycle-specific SLMCPR for another utility, it was determined that the GESTAR II (*General Electric Standard Application for Reactor Fuel,* NEDE-24011-P-A-11[1], and U. S. Supplement NEDE-24011-P-A-11-US[1], November 17, 1995) fuel type generic SLMCPR may be non-conservative when applied to some core and fuel designs. To rectify this deficiency, GE proposed, and the NRC accepted, a new procedure for determining cycle-specific SLMCPRs (Reference 1). GE also proposed, and the NRC has accepted, the application of reduced power distribution uncertainties in the calculation of SLMCPRs for plants using the 3D MONICORE model in the process computer for core monitoring (Reference 1).

DISCUSSION OF THE PROPOSED CHANGE

GENE's calculation for the plant-specific SLMCPR values for Unit 2 Cycle 16 is based upon recently approved methods and procedures for calculating SLMCPRs each operating cycle for plants using the 3D MONICORE system. The procedures incorporate cycle-specific parameters into the analysis which include the preliminary reference core loading and the actual bundle parameters evaluated at the projected exposure distribution based on projected control blade patterns for the rodded burn through the cycle. The analysis considers the full cycle exposure range to determine the most limiting point(s). At these exposure point(s), conservative variations of the projected control blade patterns are used to maximize the number of bundles that contribute rods calculated to be susceptible to boiling transition in order to obtain a conservative calculation of the SLMCPR. The calculation also includes the application of reduced power distribution uncertainties associated with the 3D MONICORE core monitoring system. This calculation resulted in a Cycle 16 SLMCPR value of 1.07 for two loop operation (TLO), and 1.08 for single loop operation (SLO). The current Unit 2 SLMCPR TS value for Cycle 15 TLO is 1.12; the SLO value is 1.14.

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[1] Revision 11 has since been superseded by Revision 13, dated August, 1996. All the Revision 13 material pertinent to this application is unchanged from Revision 11. For purposes related to evaluation of this application, Revisions 11 and 13 may be considered equivalent and used interchangeably.

EVALUATION

The proposed changes revise the Technical Specifications to reflect changes in the SLMCPRs due to the plant-specific evaluation performed by GENE for Unit 2, Reload 15, Cycle 16. The new SLMCPRs were calculated using new, NRC-approved methods and procedures (Reference 1). The procedures incorporate plant-cycle specific parameters which include: 1) the expected reference loading pattern, 2) conservative variations of projected control blade patterns, 3) the actual bundle parameters, and 4) the full cycle exposure range. The procedures also include the use of reduced power distribution uncertainties associated with the process computer system.

The SLMCPR is set such that no mechanistic 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 and 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 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 procedures used to calculate the critical power result in an uncertainty in the value of the critical power. Therefore, the SLMCPR is defined as the CPR in 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 SLMCPRs for Cycle 16 at Unit 2 are 1.07 for two loop operation and 1.08 for single loop operation.

Comparison of Hatch Unit 2 Cycle 16 and 15 SLMCPR Values

Table 1 summarizes the relevant input parameters and results of the SLMCPR determination for the Hatch-2 Cycle 16 and 15 cores. The SLMCPR evaluations were performed using NRC approved methods and uncertainties (Reference 1). These evaluations yield different calculated SLMCPR values because different inputs were used. The quantities that have been shown to have some impact on the determination of the safety limit MCPR (SLMCPR) are provided.

In comparing the Hatch-2 Cycle 16 and Cycle 15 SLMCPR values it is important to note the impact of the differences in the core and bundle designs. These differences are summarized in Table 1.

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The uncontrolled bundle pin-by-pin power distributions were compared between the Hatch-2 Cycle 16 bundles and the Cycle 15 bundles. Pin-by-pin power distributions are characterized in terms of R-factors using the NRC approved methodology (Reference 2). [[----------
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As indicated in Table 1, the NRC approved (Reference 1) revised power distribution uncertainties have been assumed for the Hatch-2 Cycle 16 analyses. For the Cycle 15 case, the standard GETAB power distribution uncertainties were used. [[----------.]]

Summary

[[----------]] have been used to compare quantities that impact the calculated SLMCPR value. Based on these comparisons, the conclusion is reached that the Hatch-2 Cycle 16 core/cycle has a flatter core MCPR distribution [[----------]] and substantially more peaked in-bundle power distributions [[----------]] than what was used to perform the Cycle 15 SLMCPR evaluation.

The calculated 1.07 Monte Carlo SLMCPR for Hatch-2 Cycle 16 is consistent with what one would expect [[----------]] the 1.07 SLMCPR value is appropriate.

Based on all of the facts, observations and arguments presented above, it is concluded that the calculated SLMCPR value of 1.07 for the Hatch-2 Cycle 16 core is appropriate. It is reasonable that this value is 0.04 lower than the 1.11 value calculated for the previous cycle. (Note: the current TS value of 1.12 is greater than the calculated value of 1.11 for Cycle 15.)

For single loop operations (SLO) the calculated safety limit MCPR for the limiting case is 1.08 [[----------.]]

Table 1

Comparison of the Hatch-2 Cycle 16 and Cycle 15 SLMCPR

[[

QUANTITY, DESCRIPTION	Hatch-2 Cycle 15	Hatch-2 Cycle 16

]]

CONCLUSION

Based on all of the information presented above, it is concluded that the calculated SLMCPR values of 1.07 and 1.08, for two loop and single loop operation, respectively, for the Hatch-2 Cycle 16 core are appropriate.

REFERENCES:

1. Letter, Frank Akstulewicz (NRC) to Glen A. Watford (GE), "Acceptance for Referencing of Licensing Topical Reports NEDC-32601P, *Methodology and Uncertainties for Safety Limit MCPR Evaluations*; NEDC-32694P, *Power Distribution Uncertainties for Safety Limit MCPR Evaluation*; and Amendment 25 to NEDE-24011-P-A on Cycle Specific Safety Limit MCPR," (TAC Nos. M97490, M99069 and M97491), March 11, 1999.

2. Letter, Thomas H. Essig (NRC) to Glen A. Watford (GE), "Acceptance for Referencing of Licensing Topical Report NEDC-32505P, Revision 1, *R-Factor Calculation Method for GE11, GE12 and GE13 Fuel*," (TAC No. M99070 and M95081), January 11, 1999.