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July 19, 1994

Docket No. 50-366 HL-4651

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

Edwin I. Hatch Nuclear Plant - Unit 2
Request to Revise Technical Specifications
For Traversing Incore Probe (TIP) Operability Requirements

Gentlemen:

In accordance with the provisions of 10 CFR 50.90, as required by 10 CFR 50.59(c)(1), Georgia Power Company (GPC) hereby proposes a change to the Plant Hatch Unit 2 Technical Specifications, Appendix A to Operating License NPF-5.

The proposal involves a change to the Plant Hatch Unit 2 Specification for the Traversing In-Core Probe (TIP) system.

Specifically, the proposed change would revise the Technical Specification 3.3.6.6 requirement for all TIP machines to be operable, to allow less than four machines to be operable. The data normally supplied by the inoperable unit would be supplied by either substituting data from traverses of symmetric locations or utilizing normalized TIP readings calculated by a process computer code.

Enclosure 1 provides a detailed description of the proposed change and the circumstances necessitating the change.

Enclosure 2 provides the basis for our determination that the proposed change does not involve a significant hazards consideration. This enclosure also provides an evaluation of the environmental assessment criteria given in 10 CFR 51.21.

Enclosure 3 provides page change instructions for incorporating the proposed change. The proposed Technical Specifications pages follow Enclosure 3. Also included are the marked up pages.

Due to its urgent nature, we request the proposal be processed as an emergency amendment in accordance with 10 CFR 50.91 (a)(5) with approval being granted prior to August 9, 1994. We also request that, once approved, the amendment be issued with an immediate effective date.

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In accordance with the requirements of 10 CFR 50.91, the designated state official will be sent a copy of this letter and all applicable enclosures.

Mr. J. D. Woodard states he is Senior Vice President of Georgia Power Company and is authorized to execute this oath on behalf of Georgia Power Company, and to the best of his knowledge and belief, the facts set forth in this letter are true.

GEORGIA POWER COMPANY

By: J. D. Woodard

Sworn to and subscribed before me this 19th day of July, 1994.

Sherry Ann Mitchell
Notary Public

MY COMMISSION EXPIRES DECEMBER 15, 1996

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Enclosures:
1) Description and Justification of Proposed Change
2) 10 CFR 50.92 Evaluation
3) Page Change Instructions

cc: (See next page.)

cc: *Georgia Power Company*
Mr. H. L. Sumner, Nuclear Plant General Manager
NORMS

U.S. Nuclear Regulatory Commission, Washington, D.C.
Mr. K. Jabbour, Licensing Project Manager - Hatch

U.S. Nuclear Regulatory Commission, Region II
Mr. S. D. Ebneter, Regional Administrator
Mr. B. L. Holbrook, Senior Resident Inspector - Hatch

State of Georgia
Mr. J. D. Tanner, Commissioner - Department of Natural Resources

Enclosure 1

Edwin I. Hatch Nuclear Plant - Unit 2
Request to Revise Technical Specifications
For Traversing Incore Probe (TIP) Operability Requirements

Description and Justification of Proposed Change

Background

Plant Hatch, Unit 2 has four gamma sensitive Traversing In-Core probe (TIP) machines that are used to periodically determine the power distribution in the core and to calibrate the Local Power Range Monitors (LPRMs). The TIP system consists of four independent gamma photon detection units. Each unit contains a miniature ion chamber which is driven from outside the primary containment by a motor drive mechanism. The detector is attached to the drive mechanism by means of a flexible drive cable. Operation of the drive mechanism causes the ion chamber to be inserted into or retracted from the reactor core within individual TIP guide tubes.

The TIP system provides a signal proportional to the axial neutron flux at 31 radial core locations. This signal provides the following:

a. Reliable calibration of the LPRM flux amplifier gains to compensate for changes in LPRM detector sensitivity which accompany prolonged neutron exposure.

b. Accurate core wide flux shapes to the computer so power and exposure distributions can be calculated, and

c. Accurate substitute inputs to the computer where LPRMs have failed.

The 31 LPRM strings are divided between the four TIP machines with one common LPRM assembly connected to all four TIPs for cross-channel calibration. Each TIP unit uses an indexing device to route the detector to the desired LPRM assembly.

The Unit 2 Technical Specifications require normalization of the TIP detectors (process computer program OD1) every 31 effective full power days (EFPD). In addition, the Technical Specifications also require performing an LPRM calibration once every 1000 effective full power hours (EFPH). This calibration also requires an OD1.

On Monday, July 11, with Unit 2 operating at 100% rated thermal power, Plant Hatch shift personnel were performing an OD1 for the purpose of completing the TIP normalization required to be performed every 31 EFPD. Nearing completion of the OD1, personnel were unable to place the 'D' TIP into channel 9. It had apparently stuck in channel 8, indicating a problem with the indexing mechanism. The indexing mechanism is located inside the primary containment (drywell), which is not accessible at the present

power level. Therefore, repairing the TIP would require a severe reduction in power to enable drywell entry. Based on the last completed LPRM calibration, the next one is to be completed no later than August 9, 1994. This date is based on 1000 EFPH plus the 25% surveillance grace period allowed per Technical Specification 4.0.2. If the surveillance is not performed by this time, it will be necessary to declare the Average Power Range Monitors (APRMs) inoperable and, thus, enter an immediate reactor shutdown per Technical Specification 3.3.1.b, Action 3. However, GPC believes that the LPRM calibration can be accurately performed with only three TIPs as opposed to the four required by Technical Specification 3.3.6.6. Accordingly, we ask that this request be processed as expeditiously as possible with approval prior to August 9, 1994.

The problem with the 'D' TIP could not have been foreseen because prior to July 11, all TIPs had been operable. Plant Hatch has had problems with the indexing mechanism in the past; however, they have been unique with a different cause for each failure. General Electric has written Technical Reports documenting these problems in an effort to prevent their recurrence.

Subsequent to discovery of the problem, efforts to return the 'D' TIP unit to operable status were initiated. These efforts have been led by Plant Engineering with vendor representatives on-site as well. We have performed tests to verify proper voltage to the indexer motor and to verify proper motor winding resistance as well as over-voltage tests on the indexing mechanism. We have also conducted a reverse motor test in an attempt to free the indexer; however, this was unsuccessful. All methods to repair the TIP without drywell access were exhausted on Friday, July 15. On July 12th, we began to investigate the possibility of running the TIP normalization with less than the Technical Spececification required number of TIPs. During cycle 10 operation of Unit 2, we obtained concurrence from the NRC to operate with only three TIPs operable. However, the situation is now different because the 'D' TIP machine contains several TIP measurement locations which do not have corresponding symmetric locations. We cannot, therefore, employ the same methodology, used in cycle 10, to obtain data for the inaccessible locations. Discussions were held on July 14 and 15 with General Electric to review the proposed methodology for obtaining data for the non-symmetrical, inaccessible channels. Efforts to prepare the Technical Specifications submittal began in earnest on July 14; it was submitted for Plant Review Board (PRB) approval on July 18. The PRB's questions were satisfactorily answered on July 19, at which time they recommended approval of the submittal. Long term plans are to repair/replace the indexer at the next cold shutdown. The damaged indexer will be examined by Plant Engineering, as well as the vendor, to determine the root cause of failure. After the root cause is found, corrective actions will be initiated, which may include design modifications to prevent future failures.

If a cold shutdown is not encountered prior to completion of the current operating cycle, the problem will be corrected no later than the end of the scheduled Unit 2 Fall 1995 refueling outage.

Justification

BWR power operation relies upon readings from fixed in-core neutron detectors known as Local Power Range Monitors (LPRMs). LPRMs are small fission chambers with an approximately linear response to the local neutron flux and, thus, local thermal power. The current Surveillance Requirement to calibrate the LPRMs periodically employs a second set of movable detectors known as the Traversing In-Core Probe (TIP) system.

The required LPRM calibration relates a known power distribution, as measured by the TIP system, to the then existing LPRM readings. When the LPRMs are normalized to one another, to the TIP readings, and to a plant heat balance calculation, the LPRMs allow determination of the local power in six inch increments axially (nodes) along the 31 LPRM strings.

Outputs from the calibrated LPRMs are used in the Reactor Protection System (Average Power Range Monitor), the Rod Worth Minimizer, the Rod Block Monitor, and the Process Computer. Accuracy requirements for the power distribution are defined by GESTAR-II, (NEDE-24011-P-A-10, Section 4.3.1.1.1) and GE Fuel Bundle Designs, NEDE-31152, which are part of the present reactor fuel licensing basis. In particular, Table 3-3 of NEDE-31152 requires the TIP readings to have a root mean square (rms) uncertainty of no more than 8.7% for reload cores. The attending Table 3-3 comment states that this is a nodal power uncertainty which also applies to the power distribution as determined by the LPRM system. Thus, the accuracy in nodal power as determined by the LPRM system between TIP sets must also meet the 8.7% rms uncertainty.

Theoretical advances in process computer monitoring include the development of new mathematical techniques and algorithms combining three dimensional reactor physics theory with on-line core data, e.g., LPRM readings. One such methodology, currently in use for Hatch 2, employs an adaptive learning algorithm using on-line, as well as historical, core data inputs to improve power calculations within the reactor physics model. This is accomplished by effectively modifying the neutron leakage terms to force the calculated power distribution to match the measured power distribution as determined by the TIP system. Subsequent calculations use the adaptive coefficients and LPRM readings during monitoring between TIP sets. The methodology is capable of calculating

substitute normalized TIP data and utilizing it when measured TIP data is missing. This reactor physics methodology was used to study the effect of operating with a failure to scan strings assigned to a TIP machine due to TIP machine failure. Detailed statistical comparisons of calculational results to identical calculations results with TIP machine failure showed a TIP machine Out-of-Service Uncertainty of 1.8%. Since this small additional uncertainty, when combined with all the other uncertainties associated with the core monitoring, yields an overall uncertainty well below 8.7%, it was concluded that plants can be operated, including performance of LPRM calibration, with a total of eight TIP measurement locations out of service indefinitely (equivalent to the maximum number of locations in a single TIP machine).

Technical Specification 3.3.6.6 for Plant Hatch Unit 2 currently requires that all four TIP machines and their associated hardware (TIP detector drive, readout equipment, and indexing mechanism) be operable. It also requires that all four detectors be calibrated in a common location. If these requirements are not met for each TIP unit, then the TIP system, in accordance with Technical Specification 3.3.6.6 is inoperable and cannot be used for recalibration of any LPRM detector or for monitoring core thermal limits (APLHGR, LHGR, or MCPR). This specification is being revised to permit the TIP system to be considered operable with less than four TIP machines operable.

The proposed amendment will allow the utilization of substitute TIP data in lieu of data from inaccessible locations. The substitute data will be derived from either symmetric TIP locations (under certain core conditions) or from normalized TIP data as calculated by the on-line core monitoring system. The action statement of Technical Specification 3.3.6.6 is modified to allow substitute TIP data to be utilized when data is not available. If the reactor is operating in an octant symmetric (type A) sequence, certain LPRM strings will have symmetric counterparts which have comparable readings due to the symmetry of the core loading and the control rod pattern. The symmetric TIP data from accessible locations may be substituted for inaccessible locations provided the core is octant symmetric and the total core TIP uncertainty for the present cycle has been measured to be less than 8.7 percent.

Certain TIP locations which lie on the axis of symmetry do not have symmetric counterparts and some symmetric pairs are monitored by the same TIP machine. Should these locations be inaccessible, TIP data will be generated by computer modeling of the core conditions using the on-line core monitoring system described earlier in this discussion, with the calculated data normalized to the available real data. Use of the computer modeling method is not limited to the locations which lie on the axis of symmetry, nor does it require octant symmetry. The computer modeling method may be

used to generate substitute TIP data for any TIP channel. Analysis supports the use of this method for the generation of substitute TIP data for a total of eight TIP measurement locations (equivalent to the maximum number of locations in a single TIP machine).

The Action Statement additions are intended to prevent load reductions or shutdowns which may be required by certain inoperable TIP equipment. The two proposed methods (using symmetric counterparts and/or a computer modeling method using a 3-dimensional core simulator) of using substitute TIP data are not new innovations and have been used at other BWRs.

Furthermore, it is noted that the new Technical Specifications, submitted to the NRC in February of this year, does not include TIP system requirements for Unit 1 or Unit 2. TIP system requirements will be included in the Technical Requirements Manual and will ultimately require less than four TIPs to be operable for thermal limit monitoring and LPRM calibration. Plant Hatch, as the lead BWR-4 plant, is scheduled to implement the improved Technical Specifications in spring of 1995.

Enclosure 2

Edwin I. Hatch Nuclear Plant - Unit 2
Request to Revise Technical Specifications
For Traversing Incore Probe (TIP) Operability Requirements

10 CFR 50.92 Evaluation and Environmental Assessment

The Commission has provided standards in 10 CFR 50.92(c) for determining whether a significant hazards consideration exists. A proposed amendment to an operating license does not involve a significant hazards consideration if operation of the facility, in accordance with the proposed amendment, would not: 1) involve a significant increase in the probability or consequences of an accident previously evaluated, 2) create the possibility of a new or different kind of accident from any accident previously evaluated, or 3) involve a significant reduction in the margin of safety.

Georgia Power Company has reviewed the proposed amendment and determined that its adoption would not result in a significant hazards consideration.

Basis for Proposed No Significant Hazards Consideration Determination:

The change does not involve a significant hazards consideration for the following reasons:

1) *The proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.*

   The TIP system is not used to prevent, or mitigate the consequences of, any previously analyzed accident or transient, nor are any assumptions made in any accident analysis relative to the operation of the TIP system. No other safety related system is affected by this change.

   The use of substitute values from symmetric TIP locations or from calculations performed by the on-line computer core monitoring system does not affect the consequences of plant transients previously evaluated in the FSAR, because the total core TIP reading (nodal power) uncertainty remains less than 8.7%. Thus, the MCPR safety limit is not affected.

2) *The proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.*

The proposed change does not involve the installation of any new equipment, or the modification of any equipment designed to prevent or mitigate the consequences of accidents or transients. Therefore, the change has no effect on any accident initiator, and no new or different type of accidents are postulated to occur.

3) *The proposed amendment does not result in a significant reduction in the margin of safety.*

The total core TIP reading uncertainties will remain within the assumptions of the licensing basis, thus, the margin of safety to the MCPR safety limits is not reduced. The ability of the computer to accurately represent nodal powers in the reactor core is not compromised. The ability of the computer to accurately predict the LHGR, APLHGR, MCPR, and its ability to provide for LPRM calibration, is not compromised. Therefore, the margin of safety is not significantly reduced.

Environmental Assessment

This proposed Technical Specifications change has been evaluated against the criteria for and identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.21. Georgia Power Company has determined that the proposed changes meet the criteria for categorical exclusion as provided for under 10 CFR 51.22(c)(9), based on the following:

1) The proposed change involves no Significant Hazards Consideration. (Refer to the Significant Hazards Consideration section of this enclosure.)

2) There is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite. The proposed changes do not affect the generation of any radioactive effluents nor do they affect any of the permitted release paths.

3) There is no significant increase in individual or cumulative occupational radiation exposure.

Accordingly, the proposed change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Based on the above discussion and pursuant to 10 CFR 51.22(b), no environmental assessment or environmental impact statement need be prepared in connection with issuance of an amendment to the Technical Specifications incorporating the proposed changes of this request.