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50-366

HL-4587

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

Edwin I. Hatch Nuclear Plant
Request to Revise Technical Specifications:
Alleviation of RPV Thermal Stratification

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 changes to the Plant Hatch Unit 1 and Unit 2 Technical Specifications, Appendix A to Operating Licenses DPR-57 and NPF-5. The following changes to the Technical Specifications are proposed:

1. Lower the anticipated transient without scram-recirculation pump trip (ATWS-RPT) setpoint by approximately 2 feet 2 inches to minimize the potential for recirculation pump trips following reactor scrams.

2. Allow restarting the recirculation pump following an RPT when the temperature differential between the coolant at the reactor bottom head and the reactor steam dome cannot be obtained, provided certain conditions are met.

Enclosure 1 provides a description of the proposed changes, an explanation of the basis for each change, and the circumstances necessitating the changes. Enclosure 2 details the bases for GPC's determination the proposed changes do not involve a significant hazards consideration. Enclosure 3 provides page change instructions for incorporating the proposed changes. Following Enclosure 3 are the proposed Technical Specifications pages and the associated markups of the existing pages.

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It is our expectation that these proposed changes, if approved, will be issued in the Improved Technical Specification (ITS) format prior to GPC's scheduled implementation of the new Technical Specifications in March of 1995. However, these changes need not be considered in the review of the conversion, nor included in the initial ITS Safety Evaluation Report. Revised pages, in the new format, will be provided after the conversion amendment is issued and prior to March, 1995.

This is being submitted as a cost beneficial licensing action (CBLA). If a thermally stratified condition were to develop in the reactor vessel following an unplanned reactor trip, and a depressurization to atmospheric conditions was required, a delay in restart for at least 24 hours could occur. Such events actually occurred at Plant Hatch in August of 1992 and October of 1993. A conservative estimate of the replacement power cost is approximately $128,000 for a day of lost generation.

To allow time for procedure revisions and orderly incorporation into copies of the Technical Specifications, GPC requests the proposed amendments, once approved by the NRC, be issued with an immediate effective date and implementation concurrent with the ITS.

In accordance with the requirements of 10 CFR 50.91, a copy of this letter and all applicable enclosures will be sent to the designated state official of the Environmental Protection Division of the Georgia Department of Natural Resources.

Mr. J. T. Beckham, Jr. states he is duly 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.

Sincerely,

J. T. Beckham, Jr.

Sworn to and subscribed before me this 13th day of October, 1994.

Doris Delene Brown
Notary Public

My Commission Expires MY COMMISSION EXPIRES NOVEMBER 3, 1997

OCV/et

HL-4587

Enclosures:

1) Basis for Change Request
2) 10 CFR 50.92 Evaluation
3) Revision Insertion Instructions

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

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

U.S. Nuclear Regulatory Commission, Region II
S. D. Ebneter, Regional Administrator
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
Request to Revise Technical Specifications:

Basis for Change Request

Background

Plant Hatch operating experience shows that following a reactor scram, coincident with a recirculation pump trip (RPT), the bottom head region of the reactor experiences a rapid cooldown. Several factors that influence the occurrence and the magnitude of the rapid cooldown are as follows:

1. The recirculation pumps are no longer available to force circulation through the reactor pressure vessel (RPV) and effect mixing.

2. The make-up water injected into the vessel following a scram is relatively cold.

3. The flow of cold water from the control rod drive (CRD) system increases following a scram.

4. Reactor water clean-up system suction flow from the bottom head region is either not available due to a system isolation or insufficient to allow adequate mixing and prevent cooldown.

The cooldown presents the operating crew with two problems:

A. The reduction in metal temperatures in the bottom head region, while the steam dome temperature remains near rated, causes an approach toward the Technical Specifications pressure/temperature limits.

B. The reduction in bottom head coolant temperatures prevents the restart of the recirculation pumps if the temperature difference between the bottom head drain and the steam dome exceeds the Technical Specifications limit of 145°F. The bottom head drain line temperature is used as a representation of coolant temperature in the bottom head region. If the drain line temperature indicator is not available, for example because of instrument malfunction or lack of forced circulation through the line, the temperature differential cannot be determined. If the temperature differential exceeds 145°F, or cannot be confirmed, the only recourse for the operating crew is to depressurize the RPV to, or close to, atmospheric pressure.

Enclosure 1
Basis for Change Request

This submittal addresses two approaches to alleviating these problems:

- Reduce the probability of an RPT.
- Provide alternatives to the drain line temperature measurement, if the recirculation pumps do trip.

Georgia Power Company believes these proposed changes will aid in preventing thermal stratification and unnecessary thermal cycles resulting from the rapid cooldown of the bottom head region and the reduction in reactor pressure to atmospheric conditions.

Furthermore, Georgia Power Company considers this a cost beneficial licensing action (CBLA) because of the potential for increased downtime caused by the need to depressurize the RPV to close to atmospheric conditions. As evidenced by the events at Plant Hatch of August 27, 1992 and October 22, 1993 (Licensee Event Reports, 50-321/1992-23 and 50-321/1993-13), the cooldown can result in startup delays of 24 hours or more. The cost in replacement power is conservatively estimated at $128,000 per day of lost generation.

Proposed Change 1

To decrease the probability of RPTs, Georgia Power Company (GPC) proposes to reduce the low water level anticipated transient without scram (ATWS)-RPT setpoint from -47 inches to -73 inches. The -47 inch setpoint appears in current Unit 1 Technical Specifications Table 3.2-9 and Unit 2 Technical Specifications Table 3.3.9.1-2.

General Electric specifically evaluated this change against existing plant transient and accident analyses and concluded that lowering the trip setpoint is acceptable.

Basis for Proposed Change 1

The ATWS-RPT is supplied by the analog transmitter trip system (ATTS). The trip logic, which consists of a high reactor steam dome pressure portion and a low water level portion, initiates an RPT to add negative reactivity following events in which a reactor scram does not occur (but should have) to lessen the effects of the event.

General Electric (GE) performed a specific evaluation for Plant Hatch to assess the effect of lowering this setpoint. All potentially affected safety analyses were evaluated. It was determined that the most limiting ATWS event is the loss of feedwater (LOFW). GE analyzed the LOFW event using approved analytical methods (REDY). The results showed that, 1.) reactor power

stabilizes at an acceptable level with the lower ATWS-RPT setpoint, and 2.) the RPV water level is adequately recovered. Thus, lowering the setpoint does not result in unstable or unacceptably high reactor power levels, or a severe reduction in RPV water level such that fuel integrity is threatened. Further, none of the three primary ATWS criteria (peak RPV pressure, peak fuel cladding temperature, and peak suppression pool temperature) are challenged by lowering the ATWS-RPT water level trip setpoint.

General Electric also evaluated the effects of lowering the setpoint on other safety analyses, namely loss of coolant accident (LOCA) and transient analyses. The present LOCA analysis (SAFER/GESTR) assumes that the recirculation pumps run back and trip at -47 inches. Tripping the recirculation pumps later in the event (at -73 inches) is more conservative because more cooling is provided to the fuel. Transient (minimum critical power ratio (MCPR)) analyses do not take credit for the ATWS-RPT trip. Therefore, changing the low water level trip does not affect the transient analyses.

Proposed Change 2

When the temperature differential between the reactor steam dome and the vessel bottom head cannot be confirmed, restarting the recirculation pumps within 30 minutes following the RPT, provided drive flow is above 40% of rated prior to the recirculation pump trip, no HPCI or RCIC injection occurs, and feedwater temperature remains above 300°F since the time of the recirculation pump trip is also acceptable. GPC proposes to implement this alternative method by adding the appropriate requirements to Unit 1 Technical Specification 3.6.E and Unit 2 Technical Specification 3.4.1.3.

Basis for Proposed Change 2

The present Technical Specifications prevent restarting the recirculation pumps unless the temperature differential between the reactor steam dome and the vessel bottom head is within 145°F to avoid thermal fatigue on the CRD penetration stub tubes in the bottom head. The thermal fatigue results from a thermal shock caused by the rush of hot water over the relatively cold stub tubes during the restart of the recirculation pumps.

When the temperature differential cannot be confirmed, an alternative is to restart the recirculation pumps within 30 minutes of the RPT, provided drive flow in either loop was above 40% of rated prior to the pump trip. This alternative would be used only in situations where neither HPCI nor RCIC injection occurs and feedwater temperature does not decrease below 300°F.

Enclosure 1
Basis for Change Request

General Electric performed an evaluation of the above proposed change and determined that, based on a review of BWR startup test data, the 30-minute restart allowance is acceptable. The startup test data show that stratification up to the 145°F level does not develop until 1 hour following the RPT. Restarting the pumps, with the noted caveats, assures sufficient mixing in the lower plenum to avoid thermal stratification and maintains the differential temperature between the steam dome and the bottom head within 145°F. GE also verified that no plant safety analysis or transient is affected by this change. Therefore, GPC believes Proposed Change 2 is acceptable for implementation at Plant Hatch.

Enclosure 2

Edwin I. Hatch Nuclear Plant
Request to Revise Technical Specifications:

10 CFR 50.92 Evaluation

In 10 CFR 50.92(c), the NRC provides the following standards to be used in determining the existence of a significant hazards consideration:

> ...a proposed amendment to an operating license for a facility licensed under § 50.21(b) or § 50.22 or for a testing facility involves no 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; or (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 license amendment request and determined its adoption does not involve a significant hazards consideration based on the following discussion.

Basis for no significant hazards consideration determination

Proposed Change 1

Proposed Change 1 does not involve a significant hazards consideration, because it does not:

1. **Involve a significant increase in the probability or consequences of an accident previously evaluated.**

   Lowering the ATWS-RPT trip will not increase the probability of occurrence of any design basis accident or transient, since this change does not physically affect any component of the reactor coolant pressure boundary (RCPB). Therefore, the probability of a LOCA event is not increased. Lowering the ATWS-RPT water level setpoint does not increase the probability of an ATWS event, since no component of the CRD system or the reactor protection system is being physically altered by this change. Also, the operation of these two systems is not affected.

Reducing the setpoint may require installation of new slave trip units; however, this addition does not increase the probability of occurrence of accidents or transients. The new trip units will be functionally identical to other slave trip units already in use at Plant Hatch and are within the design capabilities of ATTS. In conclusion, no safety-related plant system or component is being affected in a manner that would render it more susceptible to failure.

Lowering the setpoint does not result in an increase of the consequences of a previously evaluated accident. GE reviewed the proposed reduction and determined the results of the ATWS event with the lowered setpoint remain acceptable. An approved analytical method (REDY) was used to evaluate a bounding ATWS event -- LOFW. The results indicate that reactor power with the new ATWS-RPT setpoint remains stable, with no unacceptable power spikes. Hot and cold reactor shutdowns can still be ultimately attained.

The consequences of non-ATWS events are not increased. For LOCA events, reducing the recirculation pump low water level trip setpoint allows the recirculation pumps to run longer. The forced circulation provided by the recirculation pumps keeps the fuel cooler for a longer period of time. The ECCS-LOCA analysis assumes the pumps trip and coastdown early in the event. Therefore, lowering the ATWS-RPT makes the ECCS-LOCA analysis more conservative and, as a result, it does not need to change.

Based on the above discussion, Proposed Change 1 does not constitute an increase in the probability or consequences of a previously analyzed accident.

2. **Create the possibility of a new or different kind of accident from any previously evaluated.**

Lowering the ATWS-RPT trip will not alter the design or operation of any safety-related system. The change may require adding new slave trip units to ATTS; however, the new trip units will be functionally identical to the equipment already in use at Plant Hatch. Furthermore, the addition of this slave trip unit is within the design capabilities of ATTS.

Since no new operating modes, accident scenarios, or failure modes are introduced, Proposed Change 1 does not create the possibility of a new type of accident.

3. **Involve a significant reduction in the margin of safety.**

As stated previously, reducing the ATWS-RPT low water level setpoint will not cause unacceptable results for ATWS events. Specifically, the LOFW event is bounding for all ATWS events. An evaluation using approved analytical methods indicates that reducing the ATWS-RPT setpoint will not result in power instabilities or unacceptable power spikes, or prevent the mitigation of an ATWS event. (Reference Enclosure 1, Proposed Change 1.)

The ATWS-RPT aids in maintaining level above the top of the active fuel. The reduction of core flow reduces the neutron flux and thermal power and, therefore, the rate of coolant boil-off. However, the setpoint reduction does not significantly reduce the margin of safety since a substantial margin remains to the top of the active fuel.

For non-ATWS events, delaying the RPT will provide a slight improvement in the current ECCS-LOCA analysis, thereby improving the margin of safety.

The margin of safety for transients is not reduced because plant transient (MCPR) analyses do not take credit for the ATWS-RPT trip.

Proposed Change 2

Proposed Change 2 does not involve a significant hazards consideration, because it does not:

1. **Involve a significant increase in the probability of occurrence or the consequences of a previously analyzed accident.**

Allowing a recirculation pump restart within 30 minutes of a trip, when the temperature differential is unknown, will not increase the probability of occurrence of a previously analyzed accident because this change does not physically alter the RCPB. Additionally, the proposed change does not alter the design or function of any safety-related systems.

Furthermore, no recirculation system equipment is being changed as a result of this amendment. The start circuitry and trip circuitry remains unaffected. Operation of the recirculation system with the reactor at power is also unaffected. As a result, the probability of the chapter 14 and 15 events dealing with the recirculation system are not increased; i.e., trip of one or both recirculation pumps, recirculation pump seizure, recirculation flow controller failure, etc.

The purpose of the 145°F temperature differential requirement is to avoid thermal shock caused by hot water on the cold CRD stub tubes during recirculation pump restart. If the temperature differential is unable to be determined, restart within 30 minutes of the trip will not increase the probability or severity of thermal fatigue on the stub tubes. As discussed in Enclosure 1, Basis for Proposed Change 2, stratification will not develop within a 30-minute period following pump trip; thus, the temperature differential will not exceed 145°F. Additional caveats are provided to insure the required temperature differential is met. These involve certain conditions of ECCS injection, feedwater temperature, and drive flow.

General Electric verified that this provision for recirculation pump restart will not affect any plant safety analysis, including radiological analysis. Therefore, the consequences of previously analyzed events are not increased.

2. **Create the possibility of a new or different kind of accident from any accident previously evaluated.**

The proposed recirculation pump restart provisions do not introduce any new plant operating modes, accident scenarios, or equipment failure modes. All other requirements for recirculation pump restart; e.g., those addressing equipment protection and power oscillations, will continue to apply.

3. **Involve a significant reduction in the margin of safety.**

The 145°F differential temperature requirement is in place to avoid thermal fatigue on the CRD stub tubes and the in-core housing welds. Allowing the early restart with the listed caveats, when temperature indication is not available, is acceptable because the conditions for re-start insure that a stratified condition has not yet developed. Thus, the cooler vessel structures at the vessel bottom will not experience a severe thermal shock resulting from exposure to hot water following the pump restart.

This change will actually aid in preventing the development of a stratified condition, since the recirculation pumps will be restarted before a stratified condition can develop, thereby helping to maintain RCPB integrity. In the past, it has often been necessary to depressurize the RPV to atmospheric pressure before the required temperature differential was met. Proposed Change 2 should reduce the number of times depressurization is required, thus avoiding unnecessary thermal cycles on the RPV. Therefore, the margin of safety regarding the protection of RPV components from severe thermal stresses and the integrity of the RCPB has not been reduced, and may actually increase.

The margin of safety in existing plant analyses is not reduced, because none of the analyses are adversely affected as a result of allowing the pump restart within 30 minutes of the RPT, as indicated in GE's review of plant transient and accident analyses.

Enclosure 3

Edwin I. Hatch Nuclear Plant
Request to Revise Technical Specifications:

Revision Insertion Instructions

Page	Instruction
Unit 1	
3.2-20	Replace
3.6-3	Replace
Bases Figure 2.1-1	Replace
Unit 2	
B 3/4 3-6	Replace
3/4 3-67	Replace
3/4 3-68	Replace
3/4 3-69	Replace
3/4 4-3	Replace