



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 154 TO
FACILITY OPERATING LICENSE DPR-57
AND AMENDMENT NO. 92 TO
FACILITY OPERATING LICENSE NPF-5

GEORGIA POWER COMPANY
OGLETHORPE POWER CORPORATION
MUNICIPAL ELECTRIC AUTHORITY OF GEORGIA
CITY OF DALTON, GEORGIA

EDWIN I. HATCH NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-321 AND 50-366

1.0 INTRODUCTION

By letter dated September 9, 1986, Georgia Power Company (the licensee) requested modifications to the Technical Specifications (TS) for the Edwin I. Hatch Nuclear Plant, Units 1 and 2. The requested changes would:

1. Lower the minimum water level required for continued plant operation and change the point of measurement of water level from the river gauge to the pump intake structure;
2. Provide for an alternate determination of equivalent river water level when a temporary weir is in place;
3. Change the water level at which an increased frequency of level surveillance is required;
4. Delete the pump throttling requirement for Unit 1; and
5. Amend the Technical Specification Bases to reflect the above changes.

Based upon a preliminary review of the licensee's request, the NRC staff forwarded a request for additional information to the licensee on March 6, 1987. The licensee responded to this request by letter dated May 8, 1987. After further staff review and several conference calls between the staff reviewers and licensee representatives, the licensee submitted additional information regarding the requested change by letter dated December 15, 1987. In the December 15 letter, in response to concerns raised by the staff, the licensee proposed additional TS changes which would require throttling of the plant service water pumps in the event the water level, as measured in the pump well of the intake structure, drops below 61.2 feet MSL (Mean Sea Level).

2.0 EVALUATION

Each of the proposed changes is discussed separately below.

(1) Lower the minimum water level required for continued plant operation and change the point of measurement of water level from the river gauge to the pump intake structure.

The existing TS are based upon water level as measured at the river gauge, and include an allowance for a possible decrease in water level between the river and the pump well of the intake structure to allow for partial blockage of the trash rack by debris. Measurement of the water level in the pump well would be a more direct and technically correct measurement, since pump operation is dependent upon the water level in the pump well. The request to move the point of measurement from the river gauge to the pump well is, therefore, acceptable.

The existing TS minimum water level of 61.7 feet MSL, below which the plant must be shutdown, is based upon the requirements for full-power operation, assuring adequate submergence of the Plant Service Water (PSW) pumps to preclude problems with vortexing and to provide adequate Net Positive Suction Head (NPSH). The licensee argues that the minimum water level should be established based upon the requirement for safe-shutdown cooling of the plant rather than full-power operation. The staff agrees.

The actual PSW pump suction elevation is at 57.2 feet MSL. Data from the pump manufacturer (Johnson Pump) indicate that 48 inches of submergence over the pump suction bell is required to provide adequate NPSH and preclude vortexing when the pumps are delivering their rated capacity of 3,500 gallons per minute (gpm). The minimum water level in the pump well for maximum capacity PSW pump operation is thus 57.2 feet plus the 4 feet of required submergence, or 61.2 feet. The existing TS require a minimum water level of 61.7 feet, as measured at the river gauge, to allow for a 0.5 foot drop in level across the trash rack.

When the plant is operating at full power, only three of the four PSW pumps are required, each delivering approximately 7,840 gpm. Shutdown cooling of the plant requires only one PSW pump, delivering approximately 4,500 gpm.

The licensee proposes to change the minimum water level to 60.7 feet MSL, as measured in the pump well. This is an actual reduction of 0.5 feet from the minimum pump well level contemplated by the existing TS, and 0.5 feet lower than the minimum level required for full-capacity PSW pump operation.

Data from the pump manufacturer indicate that while 48 inches of submergence is required for full capacity PSW pump operation (8,500 gpm), only 32 inches of submergence is required when the pumps are delivering 7,000 gpm. The minimum allowed water level sought by the licensee (60.7 feet MSL) provides 42 inches (3.5 feet) of submergence for the PSW pumps which is more than enough for the pumps to operate at a reduced flow of 7,000 gpm, and considerably more than would be required for one pump to operate at the approximate 4,500 gpm for shutdown cooling.

To preclude the possibility of sustaining pump damage under low head conditions, the December 15, 1987 letter from the licensee proposed an additional specification that would require throttling of the PSW pump output to 7,000 gpm at any time the water level is less than 61.2 feet MSL. This throttling of the pump output would reduce the required submergence to 32 inches (per the pump manufacturer) and would preclude damage due to pump cavitation. The licensee's proposal to throttle the pump output to 7,000 gpm when the water level is less than 61.2 feet MSL is, therefore, acceptable.

In summary, the result of these proposed changes would be to: (1) change the point of measurement of the water level from the river gauge to the pump well; (2) require that the PSW pumps be throttled to 7,000 gpm at any time the water level is less than 61.2 feet MSL; and (3) require plant shutdown when the water level decreases to less than 60.7 feet MSL. The minimum required water level for 7,000 gpm PSW pump operation is 59.9 feet MSL (57.2 feet MSL pump suction elevation plus 32 inches, or 2.7 feet, required submergence) which is less than the 61.2 feet MSL elevation at which the pumps must be throttled to 7,000 gpm. Further, the minimum water level for 4,500 gpm PSW operation required for shutdown cooling is even less than the 59.9 feet required for 7,000 gpm pump output. However, the proposed TS will require plant shutdown if the water level decreases below 60.7 feet MSL, which provides a margin of at least 0.8 feet. Therefore, the minimum water levels proposed by the licensee (61.2 feet MSL for pump throttling and 60.7 feet MSL for plant shutdown) are conservative and acceptable.

The licensee also examined historical river water levels and the possible effect of high winds on the water level. The lowest flow of record in the Altamaha River is 1430 cubic feet per second (cfs) which corresponds to a river water level of 61.8 feet MSL. The hypothetical minimum flow at the Plant Hatch site is 950 cfs which corresponds to a river level of 60.8 feet MSL. Using a water level of 59.9 feet MSL, the licensee calculated the maximum reduction in water level caused by a 100-year extreme wind (106 miles per hour) to be 0.9 feet, but such extreme winds would be of short duration (about one minute) and would be expected to have a negligible effect on pumping. Further, such winds would result from meteorological systems that normally are accompanied by rain, which would result in an increase in the water level in the river. The staff calculates that the hypothetical low river water level (60.8 feet MSL) in combination with the level reduction based upon the 100-year recurrent extreme wind would result in a river water level of 60.1 feet MSL, which still is above the 59.9 feet required for PSW pump operation at 7,000 gpm. We thus conclude that the minimum river water level that could result from a combination of a hypothetical low flow and an extreme wind is still sufficient to assure adequate shutdown cooling for the plant. To assure that the actual river water level is closely monitored, the licensee proposes to verify the level every 12 hours during periods when the level has dropped below 61.7 feet MSL. This surveillance frequency will assure that the licensee is aware of a falling water level such that the pump throttling at 61.2 feet MSL and orderly plant shutdown at 60.7 feet MSL could take place if needed.

Overall, the staff concludes that the licensee's proposal to lower the TS minimum water level required for continued plant operation from 61.7 feet MSL as measured at the river gauge to 60.7 feet MSL as measured in the pump well is acceptable.

(2) Provide for an alternate determination of equivalent river water level when a temporary weir is in place.

Shortly after the licensee submitted its original request in September of 1986, a temporary weir was erected across the river downstream of the pump intake structure. Installation of the weir increased the effective water level at the intake structure. The weir was removed during later, high river flow conditions. However, it is possible that future low flow conditions could again require the installation of a weir. If so, since the requested TS minimum level would now be based upon safe shutdown considerations, the licensee proposes to add a requirement that during periods of operation with a weir installed, an additional reading of river water level will be taken at a point not affected by the weir and correlated to the level in the pump well. This would assure that, should the weir suddenly be destroyed, the actual water level will be sufficient for safe-shutdown of the plant. The requested change is, therefore, acceptable.

(3) Change the water level at which increased frequency of level surveillance is required.

The TS now require that when the river water level is less than 62.5 feet MSL, the frequency of water level surveillance will be increased to every 12 hours. Above this level, the surveillance frequency is biweekly. In line with reduction to 61.2 feet MSL for pump throttling and to 60.7 feet MSL for plant shutdown, the licensee proposes to reduce the level at which increased surveillance is required to 61.7 feet MSL. This action level leaves a 0.5 foot margin to the pump throttling level and a 1.0 foot margin to the shutdown level, which is sufficient to preclude these levels being attained unnoticed. The change is, therefore, acceptable.

(4) Delete the PSW pump throttling requirement for Unit 1.

The licensee originally proposed to delete the PSW pump throttling requirement from the Unit 1 TS. However, after discussions between the staff reviewers and licensee representatives, the licensee's December 15, 1987 letter changed this request to require PSW pump throttling when the water level drops to less than 61.2 feet MSL. This is discussed more fully in (1) above. Such throttling of PSW pumps during low flow conditions would protect the pumps from damage due to cavitation and would help assure pump availability for safe-shutdown requirements. The modified change request is, therefore, acceptable.

(5) Amend the Technical Specification Bases to reflect the changes made to the TS.

The Bases explain the reasoning behind the TS. This change is, therefore, acceptable.

The staff letter of March 6, 1987 requested clarification of the different water levels required for the PSW pumps and for the Reactor Heat Removal (RHR) service water pumps, which also take suction from the pump well of the river water intake structure. The licensee's letter of May 8, 1987 explained that the RHR service water pumps can operate at a lower water level than the PSW

pumps and that the minimum level specified for PSW pump operation is therefore controlling. The data from the pump manufacturer confirm that the RHR service water pumps require only 35 inches of submergence for full flow operation as compared to the 48-inch submergence required by the PSW pumps. This question, therefore, is satisfactorily resolved.

We conclude that the changes requested by the licensee in its September 9, 1986 letter, as supplemented by its May 8, 1987 letter, and as modified by its December 15, 1987 letter are acceptable.

3.0 ENVIRONMENTAL CONSIDERATIONS

The staff prepared an Environmental Assessment concerning the proposed amendments. It was published in the Federal Register on May 10, 1988 (53 FR 16603).

Pursuant to its Environmental Assessment and the requirements of 10 CFR 51.32, the Commission determined that the issuance of the amendments will have no significant impact on the environment.

4.0 CONCLUSION

Notice of opportunity for a prior hearing was published in the Federal Register on November 12, 1986 (51 FR 41036). No requests for a hearing were received.

We have concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: Lawrence P. Crocker, PDII-3/DRP-1/II

Dated: May 12, 1988

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May 4, 1988

DOCKET NO. 50-321
50-366

MEMORANDUM FOR: Rules and Procedures Branch
Division of Rules and Records
Office of Administration

FROM: Office of Nuclear Reactor Regulation

SUBJECT: Hatch Nuclear Plant, Units 1 and 2 (Georgia Power Company, et al)

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- Notice of Receipt of Partial Application for Construction Permit(s) and Facility License(s); Time for Submission of Views on Antitrust Matters.
- Notice of Consideration of Issuance of Amendment to Facility Operating License.
- Notice of Receipt of Application for Facility License(s); Notice of Availability of Applicant's Environmental Report; and Notice of Consideration of Issuance of Facility License(s) and Notice of Opportunity for Hearing.
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May 12, 1988

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50-366

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