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September 23, 1986

Director of Nuclear Reactor Regulation
Attention: Mr. D. Muller, Project Director
BWR Project Directorate No. 2
Division of Boiling Water Reactor Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

NRC DOCKETS 50-321, 50-366
OPERATING LICENSES DPR-57, NPF-5
EDWIN I. HATCH NUCLEAR PLANT UNITS 1 AND 2
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
REGARDING SDV VENT AND DRAIN VALVE CLOSURE TIMES

Gentlemen:

By letter of June 12, 1986, Georgia Power Company (GPC) was requested to provide additional information in regard to proposed Technical Specifications for Scram Discharge Volume (SDV) vent and drain valve closure times. The NRC questions and GPC responses are hereby provided:

NRC Question 1:

Your letter of June 14, 1984 indicates that extensive modifications would be required to meet a 30 second closure time for the Scram Discharge Volume (SDV) vent and drain valves. Your letter of September 13, 1985 seems to indicate that the necessary plant modifications have been made. If they have been made, then we do not understand why you can't agree with the 30 second closure limit. If they have not been made, quantify your estimate of "extensive modifications": For example, approximate amount of additional piping, extent of modification labor (in man-hours or dollars), length of time for completing the modifications.

GPC Response 1:

As explained in GPC's letter of June 14, 1984, two types of modifications were considered in order to meet the 30 second closure time requirement. The "minor" modification involved replacing the solenoids which actuate the SDV vent and drain valves with solenoids having a larger exhaust port, and, therefore, quicker response time. The "major" modification involved assignment of new, independent

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solenoids for each vent and drain valve, and installation of associated air piping. The "minor" modification was performed on both units, and did result in closure times of less than 30 seconds for the vent and drain valves for both units. However, there was very little margin to the 30 second time limit. (The limiting valve closed in 29.95 seconds.) GPC is proposing a closure time value of 45 seconds for two reasons: 1) The 30 second value does not provide enough margin to the actual closure times (following the "minor" modification), and 2) Analyses have been performed justifying longer closure times. GPC has no present plans to proceed with the "major" modification.

NRC Question 2:

Your analysis of valve closure times seems to be predicated on the assumption that the water level in the SDV during normal operation prior to a scram is zero, i.e., the volume does not contain water. However, considerations of drainage piping flow resistance due to friction, as well as a postulated single failure (such as a closed drain valve), could lead to a non-zero water level within the SDV. In view of the above, indicate the maximum potential water level that could accumulate within the SDV prior to a scram.

GPC Response 2:

During normal operation the SDV vent and drain valves are open and the SDV would be empty. If for any unspecified reason the drain valve was closed, the maximum water level that could accumulate within the SDV prior to a scram with rods out is that level which would result in an SDV high high level scram signal. This value is 71 gallons for Unit 1 and 57 gallons for Unit 2. The SDV high high level scram is designed to scram the reactor while enough free volume, with appropriate margin, exists in the SDV to accommodate the volume of water which will be discharged from the upper side of the CRD pistons through the scram outlet valves during scram. This ensures that all rods are fully inserted prior to SDV fillup.

Following a scram and prior to scram reset, the scram outlet valves will remain open and the SDV vent and drain valves will be closed. Under these conditions, the SDV will fill with water. When the scram is reset, the scram outlet valves close, stopping inflow into the SDV. Also, the vent and drain valves open, allowing the SDV to drain. Postulated additional scram signals immediately following scram reset provide the limiting case since the SDV would be nearly full at the time of the subsequent scram signal. A shorter closure time value actually

exacerbates this condition, since it allows less time for the SDV to drain from the initial scram prior to re-closure of the vent and drain valves. The important consideration is that this condition could only occur with all rods in (from the initial scram). Consideration of single failure is not appropriate since SDV overfill is not associated with a design basis accident. The pertinent point is that, with certain assumptions, it can be demonstrated that the SDV will overfill, but this condition can only occur after all rods are in and the SDV has performed its function. The proposed 45 second closure time limit is designed to preclude SDV overfill for normal scrams. No closure time limit will preclude SDV overfill for all postulated conditions including multiple scram signals and single failures. The consequences of SDV overfill in these remote situations are water in the vent lines, increased discharges to radwaste, and potential radiological concerns in the reactor building. These consequences are undesirable from an operational standpoint but do not represent design basis considerations.

NRC Question 3:

Your letter of November 18, 1985 provides stall flow measurements made over two full cycles of operation. This information was used as a basis for establishing a maximum post-LOCA CRD leakage. Provide justification that the stall flow value and hence your estimates of maximum post-LOCA CRD seal leakage will not be exceeded. Include a discussion of the error bounds of the data that relates the stall flow to post-LOCA flow.

GPC Response 3:

Previous GPC letters have addressed stall flow criteria for CRD rebuild. These criteria provide a high degree of confidence that excessive post-scram leakage by the CRD seals will not occur. CRD seals tend to degrade gradually with time. As long as the maintenance criteria are preserved, there is no reason to believe that CRD seal leakage will increase significantly over the values provided in our letter of November 18, 1985. It is not possible to guarantee that the stall flows provided could not be exceeded by some small degree in future cycles. However, calculations using conservative assumptions show that adequate SDV margin is preserved to accommodate some increase in average seal leakage for a 45 second vent and drain valve closure time. No information is available regarding error bounds for the data that correlate stall flow to post-scram flow. The correlation was excerpted from General Electric Topical Report NEDO-24342.

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NRC Question 4:

The General Electric report "Relaxation of Scram Discharge Volume Vent and Drain Valve Closure Times" dated December 1984 and your letter of December 22, 1983 list the Unit 1 SDV capacity as 482 gallons. Your letter of January 6, 1986 lists SDV capacities of 549 gallons for Unit 1 and 636 gallons for Unit 2. Explain these differences and provide detailed information (e.g. calculations) that will permit verification of the "as built" volume of the SDV for each unit.

GPC Response 4:

The FSAR specifies 482 gallons as the Unit 1 SDV capacity. This is a conservative, licensing basis value used by General Electric. The SDV capacity designated in the FSAR is based on a specific "volume per drive" criterion which provides the minimum SDV volume, with appropriate margin, to ensure the scram function, which is a requirement for design basis events. For consideration of non-design basis events such as SDV overfill, it is appropriate to use the actual, as-built volume rather than the FSAR volume. The volumes of 549 gallons for Unit 1 and 636 gallons for Unit 2 are based on as-built calculations performed by our Architect/Engineer. As always, these calculations are available for NRC inspection at the offices of our Architect/Engineer.

If you desire further information, please contact this office.

Sincerely,

L. T. Gucwa

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c: Georgia Power Company
Mr. J. P. O'Reilly
Mr. J. T. Beckham, Jr.
Mr. H. C. Nix, Jr.
GO-NORMS

U. S. Nuclear Regulatory Commission
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