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the southern electric system

NED 83-629

December 22, 1983

Director of Nuclear Reactor Regulation
Attention: Mr. John F. Stolz, Chief
Operating Reactors Branch No. 4
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

NRC DOCKET 50-321
OPERATING LICENSE DPR-57
EDWIN I. HATCH NUCLEAR PLANT UNIT 1
SCRAM DISCHARGE VOLUME VENT AND DRAIN VALVE CLOSURE TIMES

Gentlemen:

Enclosed is additional information in regard to our letter of December 14, 1983, which requested substitution of longer values for Scram Discharge Volume vent and drain valve closure times. Closure times for these valves were originally specified in proposed Technical Specification changes dated September 19, 1983. It has since been determined that the originally proposed closure time values cannot be met without further modifications to the scram discharge system. The closure times proposed in the December 14, 1983 letter do not meet acceptance criteria contained in the NRC's Generic Safety Evaluation Report (SER) on the BWR Scram Discharge System, dated December 1, 1980.

The enclosed qualitative analysis performed by our Architect/Engineer considers possible mechanisms resulting in hydrodynamic forces in the scram system, and their relation to vent and drain valve closure times, as discussed in the SER. It is the conclusion of the analysis that there is no evidence that the hydrodynamic forces which may be present for valve closure at 120 seconds will be significantly different than those forces which may be present at 30 seconds.

It is noted that the NRC SER contained requirements that any deviation from stated criteria be submitted to the NRC for advance approval. Through an oversight, the required submittal was not made. If the enclosed qualitative analysis is not sufficient justification for demonstrating acceptable deviation from the SER, we request a delay in implementation pertaining to valve closure times.

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Temporary operation with the longer valve closing times will not result in any threat to public health or safety. All remaining scram discharge system modifications on Unit 1 are functional. Inboard vent and drain valves will continue to operate with the same closure times as in the past. Operation with these closure times for several years has not resulted in damage to the SDV or its supports (see attachment). Only the newly installed outboard valves will be subject to longer closing times, and the only purpose of these valves is to isolate the SDV following the unlikely failure of the inboard valves. Therefore, we believe it would be reasonable to allow continued operation with the longer closure times pending resolution of this concern.

Your expeditious resolution of this concern would be appreciated in order to prevent shutdown of the unit. Please contact this office if further information is desired.

Very truly yours,



L. T. Gucwa

REB/

Enclosure

xc: J. T. Beckham, Jr.
H. C. Nix, Jr
Senior Resident Inspector, Plant Hatch
J. P. O'Reilly (NRC-Region II)

Attachment to Letter dated December 22, 1983 (Scram Discharge Volume
Vent and Drain Valve Closure Times

The mechanisms discussed by the NRC by which hydrodynamic forces could be generated in the SDV due to delayed valve closure (Ref. Dec. 1, 1980 NRC SER Para 1.3.3) have been reviewed:.

It has to be noted that the primary concern of the hydrodynamic loads was possible damage to the float level switches which was observed in certain plants where the float taps were connected directly to the vent or drain lines. At Hatch, the piping arrangement was modified such that the float taps connect directly to the 8 inch diameter SDV. This design precludes the possibility of creating a high differential pressure or flow through the float switch during a scram or scram reset which might otherwise damage the float.

The NRC describes two possible mechanisms specifically related to valve closure which could result in water hammer in the SDV. The first mechanism involves high flow rates through the vent and drain lines followed by valve closure. The second mechanism involves hot water entering the SDV and in part flashing to steam followed by valve closure. The NRC indicates that upon valve closure the SDV will pressurize causing collapse of the steam and possible water hammer. Another likely cause for steam collapse is the mixing of steam with relatively cold water in the SDV resulting from the initial rod insertion. This may possibly result in some chugging within the SDV. The apparent effect that delayed valve closure has on both mechanisms is that it allows hot water to enter the SDV. Flashing of this hot water will tend to pressurize the SDV prior to isolation and could cause high flow through the vent and drain line or result in the steam bubble collapse described above. Hot water could enter the SDV, due to CRD seal leakage, before 30 seconds following a scram as well as after. The initial scram takes approximately 6 seconds and will discharge mostly cold water into the SDV. Depending on the actual quantity of discharge, the SDV will be half to mostly full (SDV Volume Hatch Unit 1 = 482 gal.). Thereafter, hot reactor coolant driven by reactor pressure will leak by the CRD seals at up to 4 1/2 GPM/rod (617 GPM total) and will enter the SDV. (Refer to NUREG-0803). Since the gravity drain rate of the SDV is on the order of 12 GPM, the SDV will tend to pressurize due to this CRD seal leakage. This pressurization will occur before the water initially discharged into the SDV has a chance to drain out of the SDV.

It should be noted that the Hatch units have not experienced any SDV damage due to the hydrodynamic loads. As part of I&E Bulletin 79-14 walkdown, a support for the vent discharge line in the vicinity of the hub was found bent--that damage was attributed to an installation error.

Since the mechanisms identified by the NRC as causing water hammer in the SDV can occur prior to 30 seconds, as well as after, the longer valve closure times should not introduce any additional hydrodynamic forces. We conclude, therefore, that the acceptance criteria for valve closure provided (60 seconds for inboard valves, 120 seconds for outboard valves) are satisfactory.