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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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Edwin I. Hatch Nuclear Plant
Generic Letter 96-06
Response to Request for Additional Information

Ladies and Gentlemen:

By an electronic message dated May 13, 2003, the NRC staff issued request for additional information (RAI) questions in regard to the Edwin I. Hatch Nuclear Plant Generic Letter 96-06 response dated April 7, 2003. The Enclosure provides the NRC Questions and the SNC Response for each of the additional requests.

This letter contains no NRC commitments. If you have any questions, please advise.

Sincerely,

H. L. Sumner, Jr.

HLS/IL/daj

Enclosures: Response to May 13, 2003 Request for Additional Information

cc: Southern Nuclear Operating Company
Mr. J. D. Woodard, Executive Vice President
Mr. G. R. Frederick, General Manager – Plant Hatch
Document Services RTYPE: CHA02.004

U. S. Nuclear Regulatory Commission
Mr. L. A. Reyes, Regional Administrator
Mr. S. D. Bloom, NRR Project Manager – Hatch
Mr. D. S. Simpkins, Senior Resident Inspector – Hatch

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Edwin I. Hatch Nuclear Plant
Generic Letter 96-06
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Enclosure

Response to May 13, 2003
Request for Additional Information

Enclosure
Response to May 13, 2003, Request for Additional Information

NRC Question No.1

In response no. 4, the licensee stated that due to the short duration of the waterhammer event, the waterhammer loads are not combined with seismic or other occasional loads. However, a review of the Unit 1 Final Safety Analysis Report (FSAR) section A.3.1 and the Unit 2 FSAR section 3.9.2 indicates that these loads are required to be combined and evaluated. While the occurrence of waterhammer in the service water piping due to the specific events discussed in Generic Letter (GL) 96-06 may not have been previously evaluated, GL 96-06 was issued to ensure that these events are evaluated in accordance with the licensing basis for the plant. Therefore, the postulation of these events and the resultant waterhammer in this system should not be considered to be beyond the licensing basis. This would therefore require that the methodology outlined in the plant FSAR be followed regarding the combination of loads, even though some of the loads may occur over a very short time period. Accordingly, please provide an evaluation summary of the structural analysis for analyzed waterhammer event in the nuclear service cooling water system in combination with other appropriate loads, according to the plant FSAR.

SNC Response

This postulated waterhammer event is not applicable for Unit 2. Regarding Hatch Unit 1, the containment cooling system does not experience waterhammer unless a loss-of-coolant accident (LOCA) with a concurrent loss of offsite power (LOSP) has occurred (a concurrent LOCA/LOSP is the deterministic licensing basis). An LOSP or a LOCA will not lead to a waterhammer event in the containment cooling system at Hatch. While it is clear the Hatch licensing basis considers a LOCA with concurrent LOSP, it is not necessary from a licensing perspective to consider a concurrent LOCA/LOSP and seismic event. It is certainly not required to assume a concurrent LOCA/LOSP and a seismic event timed to occur at the exact instant following a LOCA/LOSP to maximize loads. It is also clear that reactor coolant pressure boundary piping (postulated to rupture and initiate the LOCA) is designed to withstand a seismic event; hence the earthquake is not postulated to cause the LOCA. Confusion is caused by the fact that many containment loads have been developed considering LOCA and an operating basis earthquake (OBE), plus deadweight, thermal, etc. However, these loads are combined using methods (e.g., square root sum of the squares [SRSS] such that the additional loads are de-phased.

This is a new event, and its consequences have been analyzed using our current licensing basis. However, the seismic and waterhammer loads are not required to be combined in the containment cooling system. This position is further supported by Unit 1 FSAR section 12.3. At Hatch, the seismic event is expected to last only 20 to 30 seconds, with the strongest motion expected only within the first 4 to 6 seconds. This postulated waterhammer event does not occur until about 38 seconds after the LOCA. This time is based on the sequence of pump restart following the LOSP and the time following pump start for the column closure waterhammer event. So, even if a LOCA/LOSP were combined with a seismic event, waterhammer and seismic loads for the containment cooling system would not occur at the same time. Note also that the only function of the containment cooling system is to maintain its pressure boundary in the LOCA event. This is satisfied for all credible load combinations for Hatch Unit 1. Hatch Unit 1 FSAR section A.3.1 does not provide requirements for combining waterhammer loads resulting from a LOCA/LOSP with seismic loads.

Enclosure
Response to May 13, 2003, Request for Additional Information

NRC Question No. 2

In response no. 4, the licensee stated that, when nuclear service cooling water system pipe supports were determined to exceed allowable limits, they were removed from the analysis, while the actual supports were left in place. The staff has generally not accepted this method of analysis, except in cases involving evaluation of interim operability. This is due to the uncertainty in how and when overloaded supports would actually fail and whether the actual response could be greater than for the analysis with the failed supports removed. With supports removed from the analysis, but not from the actual piping system, the analyzed structural frequencies could be significantly different than those in the actual configuration, which could result in underestimation of the structural response. As discussed above in question 1, the waterhammer event being addressed is a licensing basis occurrence, and the piping supports, in addition to the piping itself, should meet allowable stresses. Therefore, please provide an evaluation summary of the piping and piping support analysis, consistent with the actual configuration, which demonstrates that the appropriate allowable stresses are not exceeded.

SNC Response

The analysis of piping supports during waterhammer loading indicated that some supports exceeded stress allowables due to the waterhammer loads. These supports were removed from the analysis model, which was then iterated until a configuration was achieved with the piping and remaining supports which were within the allowable stresses. This iterative process means that the piping system was analyzed in many configurations corresponding to the different numbers of supports remaining. Therefore, the change in analyzed structural frequencies and its affect on structural response between the "actual" configuration, and configurations with fewer supports, has been considered. Note also that supports removed from the model inherently would be expected to absorb some of the waterhammer energy prior to exceeding allowable stresses. However, this was not considered in the model, and as such, the load on the remaining supports was maximized by the loading model.