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Mr. Ronald C. Haynes, Administrator
U. S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Region I
631 Park Avenue
King of Prussia, Pennsylvania 19406

Dear Mr. Haynes:

SIGNIFICANT CONSTRUCTION DEFICIENCY
UNDERESTIMATED ANNULUS PRESSURIZATION LOADS
HOPE CREEK GENERATING STATION

On October 28, 1982, a verbal report was made to Region I, Office of Inspection and Enforcement representative, Mr. L. Norrholm, advising of a potentially significant construction deficiency concerning annulus pressurization loads higher than previously calculated. The following report is provided in accordance with the requirements of 10CFR50.55(e).

As a part of the analysis needed to address the NRC's generic concern regarding asymmetrical loads on the Reactor Pressure Vessel (RPV) due to pipe breaks at the vessel nozzles, Bechtel in January, 1979 calculated the recirculation outlet line break mass release rate based on a 50/50% (annulus/drywell) flow split. This calculation also generated the force-time histories which were subsequently transmitted to General Electric and used to determine annulus pressurization (AP) response spectra at various locations, to include the RPV and RPV internals.

Using the AP response spectra, GE analyzed the loads imposed on the RPV, RPV internals and GE supplied piping attached to the vessel. Consequently, several design modifications were implemented to accommodate these loads.

During preparation of the Hope Creek FSAR, Bechtel identified an error in the manner in which they had applied the GE methodology for calculating the mass release rate for the recirculation outlet line break in their analysis of January, 1979, which resulted in underestimation of the AP loads.

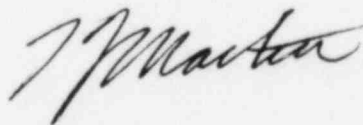
If the error had gone undetected and if the postulated AP event occurred, vibratory loads on the RPV, RPV internals and surrounding structures would have been higher and in some cases could have caused stresses to exceed the design parameters. This could have adversely affected safe shutdown of the plant through possible impairment to the control rod drive and/or ECCS systems. This deficiency is therefore determined reportable in accordance with 10CFR50.55(e).

Bechtel is incorporating a design modification to provide a flow diverter for the recirculation system outlet which will only allow 25% of the flow into the annulus as compared with the 50% assumed in January, 1979.

Correctly applying GE's mass relief rate methodology, Bechtel recalculated the force-time histories based on the 25/75% flow split. The revised force-time histories and loads were compared with the 1979 histories and loads to ensure that the intended design modification results in lower forces on the RPV and bioshield. Evaluation of the combined effect shows the forces are lower for the revised loads, except locally at the flow diverter attachment. Consequently, GE and Bechtel have concluded that the use of the previously generated AP response spectra is conservative for the Hope Creek plant given the flow split of 25/75%.

An independent technical review of design calculations generated by the Engineering Group involved has been performed to ensure that similar errors do not exist. Based on the results of this review we conclude that this was an isolated occurrence and, consequently, no procedural changes are considered necessary to prevent recurrence.

Very truly yours,



cc: Office of Inspection and Enforcement
Division of Reactor Construction - Inspection
Washington, D. C.

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