



October 12, 1979

Mr. Harold R. Denton, Director  
Office of Nuclear Reactor Regulation  
Attn: Mr. O. D. Parr, Chief  
Light Water Reactors Branch No. 3  
Division of Project Management  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Serial No. 810/092879  
PSE&C/GLP:mac:wang  
Docket No. 50-339

Dear Mr. Denton:

We have reviewed your letter of September 28, 1979 requesting additional information concerning "Temperature Effects on Level Instrument Reference Legs." We are not able at this time to respond to each item in your letter in the detail that you have requested. We will describe the actions we are taking on each item in order to have an adequate response by October 26, 1979.

Item 1

Describe the liquid level measuring systems within containment that are used to initiate safety actions or are used to provide post-accident monitoring information. Provide a description of the type of reference leg used, i.e., open column or sealed reference leg.

Response 1

The following liquid level measuring systems inside containment are used to initiate safety actions.

A. Steam Generator Narrow Range Water Level

Open reference Leg, D/P System

- 1) High-high steam generator level - Turbine trip and feedwater isolation.
- 2) Low steam generator water level coincident with steam flow-feed flow mismatch - Reactor Trip.
- 3) Low-low Steam Generator Water Level - Reactor Trip and Auxiliary Feedwater Pump Initiation.
- 4) Post Accident Monitoring.

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B. Pressurizer Water Level

Sealed Reference Leg

- 1) High Level - Reactor Trip
- 2) Post Accident Monitoring

Item 2

Provide an evaluation of the effect of post-accident ambient temperatures on the indicated water level to determine the change in indicated level relative to actual water level. This evaluation must include other sources of error including the effects of varying fluid pressure and flashing of reference leg to steam on the water level measurements.

Response 2

Westinghouse has provided a table of corrections for temperature effects on the Steam Generator Level; they have been requested to address the other concerns in Item 2 and to supply the appropriate information for each condition.

We have requested the same information for effects on sealed reference legs.

Item 3

Provide an analysis of the impact that the level measurement errors in control and protection systems (2 above) have on the assumptions used in the plant transient and accident analysis. This should include a review of all safety and control setpoints derived from level signals to verify that the setpoints will initiate the action required by the plant safety analyses throughout the range of ambient temperatures encountered by the instrumentation, including accident temperatures. If this analysis demonstrates that level measurement errors are greater than assumed in the safety analysis, address the corrective action to be taken. The corrective actions considered should include design changes that could be made to ensure that containment temperature effects are automatically accounted for. These measures may include setpoint changes as an acceptable corrective action for the short term. However, some form of temperature compensation or modification to eliminate or reduce temperature errors should be investigated as a long-term solution.

Response 3

We have requested Westinghouse to review the plant transient and accident analysis to determine if present analyses are still valid or if setpoint changes are required to maintain adequate protection system settings to ensure that the plant remains within its design parameters.

Westinghouse is pursuing a long-term fix for temperature effects by correcting level measurement signals with a temperature signal.

For the short-term, we have insulated the Steam Generator Reference Legs so that setpoint change will not be required at this time. The magnitude of the setpoint change would cause inadvertant trips when starting up and shutting down the Unit. The reference legs insulation will provide a sufficient time lag such that tripping will occur before a significant temperature error is introduced. The long-term monitoring would then have to be corrected using the results of Item 2. The insulation is being installed per Westinghouse recommendations.

Item 4

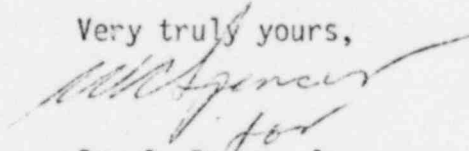
Review and indicate the required revisions, as necessary, of emergency procedures to include specific information obtained from the review and evaluation of Items 1, 2, and 3 to ensure that the operators are instructed on the potential for and magnitude of erroneous level signals. Provide a copy of tables, curves, or correction factors that would be applied to post-accident monitoring systems that will be used by plant operators.

Response 4

Tables, curves, or correction factors will be included in the emergency procedures and operators will be instructed in the use of the above. The aforementioned information will be provided when Westinghouse completes Items 2 & 3.

Should you require further information prior to our final response, please contact us.

Very truly yours,



Sam C. Brown, Jr.  
Senior Vice President - Power Station  
Engineering and Construction

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