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November 26, 1996

Mr. Nicholas J. Liparulo, Manager  
Nuclear Safety and Regulatory Analysis  
Nuclear and Advanced Technology Division  
Westinghouse Electric Corporation  
P.O. Box 355  
Pittsburgh, Pennsylvania 15230

SUBJECT: COMMENTS ON THE AP600 DETECTION OF REACTOR COOLANT PRESSURE BOUNDARY LEAKAGE

Dear Mr. Liparulo:

The Nuclear Regulatory Commission (NRC) staff has recently been attempting to close out the review of various AP600 standard safety analysis report (SSAR) chapters which have relatively few remaining open items identified in the open item tracking system. During the review of AP600 SSAR Chapter 5, the staff has been concentrating its effort on leak detection instrumentation to ensure that the design is capable of detecting reactor coolant pressure boundary leakage of 0.5 gpm which is used as a criteria for leak-before-break piping analyses. In a telephone conversation with your staff on November 22, 1996, it was noted that the reactor coolant system (RCS) leak detection capability of containment atmosphere radioactivity monitor (gaseous N13/F18) instrumentation is only effective above 20 percent power. Therefore, use of this instrument for leak detection does not appear to be appropriate for modes 2, 3, or 4, as well as mode 1 below 20 percent. The staff also notes that the use of a gaseous N13/F18 monitor is inconsistent with technical specification requirements which states that the containment atmosphere radioactivity monitor shall be operable in modes 1, 2, 3, and 4.

Upon further consideration, the staff has some additional concerns about the design capabilities of AP600 leak detection system. Besides the containment atmosphere radiation monitor, the other required RCS leak detection instrument (per technical specifications) is the containment sump level monitor. Condensate from the containment fan coolers, floor drains, and the containment shell gutter drains is normally directed to the containment sump. The containment sump level instrumentation is capable of detecting level changes equivalent to 0.5 gpm leak rate increase within one hour. However, this capability would be circumvented should the containment shell gutter system be redirected to the in-containment refueling water storage tank, such as would occur with the actuation of the passive residual heat removal system (PRHR). Since the PRHR system can be operational in modes 2, 3, or 4, the use of the containment sump level monitor to detect unidentified reactor coolant pressure boundary leakage can not be assured under all anticipated operational conditions.

Because of the importance of the leak detection system for assuring the validity of the leak-before-break applications used in the AP600 RCS piping design, it is the staff's opinion that Westinghouse should give these concerns a high priority.

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During the November 22, 1996, telephone conference on this subject, the staff also noted several editorial errors in the SSAR section on leak detection. The definition of identified leakage provided in Section 5.2.5 is inconsistent with technical specification and is incorrect. In addition, the referenced applicable technical specifications in Section 5.2.5.7 are incorrect.

If you have any questions regarding this matter, you can contact me at (301) 415-1141.

Sincerely,

original signed by:

William C. Huffman, Project Manager  
Standardization Project Directorate  
Division of Reactor Program Management  
Office of Nuclear Reactor Regulation

Docket No. 52-003

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Docket No. 52-003  
AP600

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