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August 31, 1983

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Docket Nos: 50-390
and 50-391

Mr. H. G. Parris
 Manager of Power
 Tennessee Valley Authority
 500 A Chestnut Street, Tower II
 Chattanooga, Tennessee 37401

Dear Mr. Parris:

Subject: Fire Protection Issues at the Watts Bar
 Nuclear Plant, Units 1 & 2

After review of TVA's July 26, 1983, submittal and subsequent discussions with your staff, the NRC staff cannot find sufficient justification for changing its position regarding the supervision of fire alarm and detection circuits, including those from fire alarm panels to fire suppression system actuating mechanisms. The basis for this position as stated in the Watts Bar Safety Evaluation Report (NUREG-0847, June 1982) has not been altered by the additional information provided by your staff. Our principal concern is that without electrical supervision, a single break or ground fault condition could render a fire protection system inoperative without warning. The resulting degradation of fire safety would be undiscovered for periods up to one month in length.

In addition, we have evaluated your December 13, 1982, and July 26, 1983, position that the piping for pre-action type sprinkler systems is supervised via pressure switches downstream of the system control valves. Based on our review, the NRC staff has determined that pressure switches do not constitute acceptable pipe supervision per NFPA 13. Our evaluation of this item is enclosed.

If you have any questions concerning this matter, please contact the project manager, T. J. Kenyon, at (301) 492-7266.

Sincerely,

Thomas M. Novak, Assistant Director
 for Licensing
 Division of Licensing

Enclosure:
 As stated

cc: See next page.
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DATE	8/23/83	8/23/83	8/23/83	8/23/83	8/24/83		

WATTS BAR

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Air Supervision of Pre-Action
Sprinkler Systems

The applicant in the Watts Bar Fire Protection Program Evaluation of April 18, 1977, states that the automatic sprinkler systems will be in conformance to the requirements of NFPA Standard No. 13. Section 5-3.5.2 of NFPA 13 states that "sprinkler piping of pre-action system containing more than 20 heads shall be automatically supervised." Region II observed that the pre-action systems for the cable spreading room and at elevation 755 ft. of the control building are not supervised.

By letter dated December 3, 1982, to Region II the applicant stated that the systems are supervised by pressure switches located downstream of the system control valves. The switches provide alarm annunciation in the Main Control Room anytime a control valve opens.

A major concern with pre-action-type sprinkler systems is the integrity of piping. In conventional wet and dry pipe sprinkler systems, a pipe rupture would be apparent soon after it occurred, due to water leakage or loss of air pressure. Loss of pipe integrity on pre-action systems would in all likelihood be apparent only after the deluge valve tripped and water entered the system. This limitation is critical to the effectiveness of the system during a fire since a pipe break upstream from the fire would reduce/prevent water from being discharged onto it. In addition, undiscovered pipe cracks or breaks negate the protection against inadvertent actuations of the pre-action system. They have the potential to cause adverse impacts on water sensitive electronic components, due to water discharge if the deluge valve is inadvertently opened. Consequently, effective supervision is necessary to discover the loss of pipe integrity at an early stage.

The applicant's use of pressure switches does not satisfy the pipe supervision requirements of NFPA 13 because these switches are designed to detect water flow and not loss of pipe integrity as required. However, supervision via low air pressure maintained in the piping, with an appropriate low air pressure alarm, does conform to Section 5-3.5.2 of NFPA. This type of supervision has been utilized by the applicant for other pre-action systems in the plant.

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