

June 19, 1990

Docket No. 50-390

Mr. Oliver D. Kingsley, Jr.
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Tennessee Valley Authority
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Dear Mr. Kingsley:

SUBJECT: WATTS BAR UNIT 1 - COMMENTS ON THE TVA RESPONSE TO GENERIC LETTER 88-17 WITH RESPECT TO EXPEDITIOUS ACTIONS FOR LOSS OF DECAY HEAT REMOVAL (TAC NO. 69792)

By letters dated January 6, February 2 and May 31, 1989, you responded to NRC Generic Letter (GL) 88-17. You indicated that you will implement the guidance of GL 88-17 prior to fuel load. We find that your response appears to meet the intent of the GL on expeditious actions, but lacks some of the details requested in Enclosure 2 of the GL. Hence, we request that you consider several observations as described in the enclosed document.

There is no need for you to respond to the observations. Our review of your program enhancements is ongoing and will be addressed in a future letter.

Sincerely,

Original signed by

Peter S. Tam, Senior Project Manager
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Division of Reactor Projects I/II
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cc: As stated

cc w/enclosure:
See next page

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Generic Letter 88-17 Response Review Results

Generic Letter (GL) 88-17 was issued on October 17, 1988 to address the potential loss of decay heat removal (DHR) during nonpower operation. In the GL, we requested (1) a description of your efforts to implement the eight recommended expeditious actions of the GL and (2) a description of the enhancements, specific plans and a schedule for implementation of the six recommended program enhancements.

The NRC staff has reviewed your response to Generic Letter 88-17 on expeditious actions in the letters of January 6, 1989, February 2, 1989 and May 31, 1989. Your letter of February 10, 1989 also included the response for programmed enhancements. This response will be reviewed at a later time. You have indicated that you will implement GL 88-17 in one phase and that commitments made will be in place at fuel load. We find that your response appears to meet the intent of the GL for expeditious actions but lacks some of the details requested in Enclosure 2 of GL 88-17. Your response to some items is brief and therefore does not allow us to fully understand your actions taken in response to GL 88-17. You may wish to consider several observations in order to assure yourselves that the actions are adequately addressed:

1. In regard to the Diablo Canyon event, related events, lesson learned and training, you state that "the training specified in the generic letter will be provided for Watts Bar operations personnel during the 1989 Requalification Training Classes." This brief statement does not give an outline or discussion of the training program and does not specifically

state that maintenance personnel are also included in any of the training. The item was intended to include all personnel who can affect reduced inventory operation.

2. Regarding containment closure you state that "procedures and administrative controls will be developed and procedure changes will be made to reasonably assure containment closure can be achieved within the time at which a core uncovering could result from a loss of RHR coupled with an inability to initiate alternate cooling or addition of water to the RCS inventory." These times should be based on analysis. You have not referred to an analysis or stated what the time frame for containment closure is. Until plant specific calculations have been completed, Generic Letter 88-17 applies and states that "containment penetrations including the equipment hatch, may remain open provided closure is reasonably assured within 2.5 hours of initial loss of DHR." This closure time will be less if there are vent areas totaling greater than 1 square inch in the cold leg (see Enclosure 2, Section 2.2.2 of GL 88-17).
3. In some plants the quick closure of the equipment hatch is achieved by the installation of a reduced number of bolts. If you plan to use less than the full complement of bolts for sealing the equipment hatch then you should first verify that you can make a proper seal of the periphery mating surfaces to meet the closure criteria.
4. As previously discussed with you for the Sequoyah plant, we agree that because of the "inverted top hat" style of upper reactor internals, and the potential of degrading the sealing system between the reactor vessel and its head, an exception to the containment closure requirements when the reactor vessel head is being reinstalled after refueling is acceptable. This will allow Watts Bar to substitute a five foot value below the reactor vessel flange instead of three foot for the implementation of administration controls for containment closure. The

other recommendations in the generic letter regarding independent level instrumentation and additional coolant injection should be met any time the RCS is below three feet of the reactor vessel flange.

5. In your letter of May 31, 1989 you stated that your plan for RCS level monitoring include wide range, narrow range and backup indication. For the wide range indication your plan is to use the Reactor Vessel Level Indication System (RVLIS). The range of indication will be from above the vessel flange to near the bottom of the hot leg. This is further described in your letter of February 2, 1989 as a system that infers RCS level from sensing the differential pressure between the hot leg and the top of the reactor vessel head. The RVLIS is stated to provide alarm and indication functions in the control room. The accuracy of this system was not provided. For the narrow range which encompasses the inside diameter of the hot leg pipe, you have stated that TVA has not yet decided which of the level system options, as listed in the letter of February 2, 1989, that you will use. For the backup indication, you state in the letter of May 31, 1989, that a sight gauge will be utilized for both the narrow and wide range indications. The range of the sight gauge will be from above the vessel flange to below the hot leg. In your letter of February 2, 1989 this system is further described being vented to the atmosphere or the pressurizer. The pressure tap location is not specified. You state that this system has no alarm function but is accurate over a wide range. However, the value of accuracy is not specified. There is no indication that the readings can be monitored in the control room. If monitored from a location other than the control room the guidelines of GL 88-17 in Section 2.4 of Enclosure 2 should be followed which states that there must be provision for providing immediate water level values to an operator in the control room if significant changes occur. The observations should be recorded at an interval no greater than 15 minutes during normal conditions. From your description it can not be determined if this sight gauge is a tygon tube. If so,

walking the tygon tube following installation to verify lack of kinks or loop seals is necessary. Experience shows that periodic walkdowns are needed after installation. We recommend daily walkdowns when the tygon tube is in use, with an additional walkdown immediately prior to its being placed in use. When two or more level instruments are in place, care should be taken to resolve any discrepancy between the measurement systems. Also, the pressure of the reference leg should approximate the pressure of the void in the hot leg or be compensated to obtain the correct level value.

6. For the expeditious action regarding provision of at least two available or operable means of adding inventory to the RCS that are in addition to pumps that are a part of the normal DHR systems, you have stated that you will have two means from the following six sources. These sources are two Safety Injection pumps, two Centrifugal Charging pumps, gravity feed from the Refueling Water Storage Tank (RWST), or possibly some other source, provided that the flow from the selected source is adequate and a reasonably reliable flow path is available. As you indicate, calculations will need to be performed to determine the flow rate necessary to make up the boil off which could occur when the RCS is in a reduced inventory condition. You have not described the injection path. This should be provided in a procedure. As alluded to in Enclosure 2, Section 2.2.2 of GL 88-17, if openings totaling greater than 1 square inch exist in the cold legs, reactor coolant pumps and crossover piping of the RCS, the core can uncover quickly when pressurized under loss of RHR conditions. If this situation should arise, it is generally more effective to inject makeup water into the hot leg rather than the cold leg.
7. You have not stated the use of any specific vent openings on the hot side of the RCS to relieve RCS pressurization except to state that a detensioned reactor vessel head is being considered. Calculations need to be performed, as you have stated, to verify the effectiveness of RCS

openings. Even for relatively large hot side openings in the RCS, pressurization to several psi can still result. For example, with removal of a pressurizer manway large steam flows in combination with flow restrictions in the surge line and lower pressurizer hardware may still lead to pressurization.

In Enclosure 3 of your February 2, 1989 letter you have listed 26 commitments regarding GL 88-17 for Watts Bar. In a number of them you indicate calculations and analyses are needed before decision can be made for implementation. Since you have indicated that TVA's action in response to GL 88-17 will be implemented in a single-phased program for both expeditious action and programmed enhancements, it is expected that your completed actions including calculations and analyses, will be available prior to operating in a reduced inventory condition.

There is no need to respond to the above observations.

As you are aware, the expeditious actions you have briefly described are an interim measure to achieve an immediate reduction in risk associated with reduced inventory operation, and these will be supplemented and in some cases replaced by programmed enhancements. You have indicated that you plan to implement GL 88-17 in a one-phase program by the time of fuel load. We intend to audit both your response to the expeditious actions and your programmed enhancement program. The areas where we do not fully understand your responses as indicated above may be covered in the audit of expeditious actions.

This closes out the staff review of your responses to the expeditious actions listed in the GL. The area of programmed enhancements will be addressed in a separate letter.

Principal contributor

H. Balukjian