September 29, 2000

Mr. J. A. Scalice
Chief Nuclear Officer
and Executive Vice President
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

SUBJECT: BROWNS FERRY UNIT 2, PROPOSED RISK-INFORMED INSERVICE INSPECTION PROGRAM, REQUEST FOR ADDITIONAL INFORMATION (TAC NO. MA8873)

Dear Mr. Scalice:

By letter dated June 1, 2000, you submitted a proposed risk-informed inservice inspection program for Browns Ferry Unit 2. The staff is currently reviewing your request. The reviewers have determined that additional information is needed. The reviewers' questions are attached.

For the staff to complete its safety evaluation by the requested date, your response addressing these issues is needed by October 16, 2000.

These questions were discussed with Ted Achorn of your staff, in a telecon on September 25, 2000. If you have any questions regarding this issue, please contact me at 301-415-3026.

Sincerely,

/RA by Leonard A. Wiens for/
William O. Long, Senior Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-260

Enclosure: Request for Additional Information

cc w/enclosure: See next page

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REQUEST FOR ADDITIONAL INFORMATION ON BFN2 RI-ISI
BROWNS FERRY UNIT 2, RISK-INFORMED INSERVICE INSPECTION

Materials and Chemical Engineering Branch Questions:

1. Please provide the following information:
   a. When does the current 10-year inspection interval start and end?
   b. When does the current inspection period start and end?
   c. What cumulative percentage of inspections have been completed for the current interval?

2. The implementation of a risk-informed inservice inspection (RI-ISI) program for piping should be initiated at the start of a plant's 10-year inservice inspection interval consistent with the requirements of the American Society of Mechanical Engineers (ASME) Code Section XI, Edition and Addenda committed to by the Owner in accordance with 10 CFR 50.55a. However, the implementation may begin at any point in an existing interval as long as the examinations are scheduled and distributed to be consistent with ASME XI requirements, e.g., the minimum examinations completed at the end of the three inspection intervals under Program B should be 16%, 50%, and 100%, respectively, and the maximum examinations credited at the end of the respective periods should be 34%, 67%, and 100%.

   It is our view that it is a virtual necessity that the programs for the risk-informed inspections and for the balance of the inspections be on the same interval start and end dates. This can be accomplished by either implementing the RI-ISIs at the beginning of the interval or merging RI-ISIs into the program for the balance of the inspections if the RI-ISIs are to begin during an existing ISI interval. One reason for this view is that it eliminates the problem of having different Codes of record for the RI-ISIs and and for the balance of the inspections. A potential problem with using two different interval start dates and hence two different Codes of record would be having two sets of repair/replacement rules depending upon which program identified the need for repair (e.g., a weld inspection versus a pressure test).

   In addition, with the change to an RI-ISI program the Code minimum and maximum percentages of examination per period still apply to the RI-ISIs. For example, if a licensee is interested in starting the RI-ISIs during the second period, either the RI-ISIs or the Code required inspections should satisfy the second period minimum/maximum percentages. The code required percentages would have already been satisfied for the first period.

   Please describe your implementation plan with respect to the above discussion.

3. Will the RI-ISI program be updated every 10 years and submitted to the U.S. Nuclear regulatory Commission (NRC) consistent with the current ASME XI requirements?

4. Under what conditions will the RI-ISI program be resubmitted to the NRC before the end of any 10-year interval?

Enclosure

Probabilistic Safety Assessment Branch Questions

5. The Westinghouse Commercial Atomic Power (WCAP) methodology requires that inspections for augmented programs should be credited in the "without ISI calculations" used to determine the risk significance of the segments. That is, the weld failure probability calculated for welds currently inspected in the Categories B through G under the current intergranular stress-corrosion cracking program should include the reduction in failure likelihood caused by these inspections. Did you include the inspections of the B through G welds while calculating the "without ISI calculations"? What was the frequency of the inspection used as input for each of the different Categories B through G?

6. Our approval for the selection of only one "applicable" case ("with operator action" or "without operator action" for core damage frequency/large early release frequency (CDF/LERF)) for the Brown's Ferry 3 change in risk calculation was based on the simplicity of the actions that had to be performed and the time available for the operators to perform the action. Please describe the operator actions selected as the "applicable case" when the change in risk calculations were performed. In so far as these operator actions are covered in more detail in Question 7 below, they may be described in the answer to question 7.

7. On page 7 of your submittal you note that assigning segments with a risk reduction worth (RRW) >1.001 (instead of 1.005) as HSS was approved in lieu of doing a sensitivity study. We approved this in lieu of the sensitivity study and not as a extra defense in depth consideration as implied on page 17 of your submittal. Therefore, in your methodology, there is no difference between a segment with a RRW >1.005 and one with a RRW >1.001 although you seem to differentiate them in your submittal.

   a. In general, reduction of a high safety significance (HSS) to a low safety significance (LSS) by the expert panel requires careful consideration and justification. Page 18 of your submittal states that the expert panel placed six segments in LSS based on the ease of the operator action. Please describe each individual action, the detection mechanisms, and the time available for these actions.
   b. Review of your Attachment 1 indicates that there are seven segments that have RRW >1.001 without operator action that are not listed HSS, not six as page 18 of your submittal states. The seven are 2-067-003, 2-067-004, 2-067-005, 2-067-007, 2-071-011, 2-074-008, 2-074-009. Please explain this discrepancy.

8. Does the High Energy Evaluation discussed in the Browns Ferry 2 submittal evaluate the spatial effects of the failure of high pressure piping that is normally on stand-by at low pressure? If not, how were the spatial effects of this piping evaluated?

9. Page 22 states that all locations identified for examination are already identified under existing programs. On page 24 you state that in some instances locations may be found for which it is not possible to examine >90%. If you are already inspecting all the RI-ISI locations in your current programs, please explain how such a weld might be found.

10. Please explain the LLO initiating event in Table 3.3-2 and the associated table entries. The values given seem inconsistent with the the other entries.

11. You state that although all your RI-ISI locations are currently being inspected, the application is risk neutral when the change in CDF and LERF is evaluated. There are other risk criteria that must be met for a WCAP RI-ISI application contained in Section 4.4.2 of the WCAP. Please provide us with the results of your evaluation that allowed you to state that the risk/safety evaluation criteria in 4.4.2 of the WCAP are met.

12. Risk informed regulation requires that all risk contributors are included in the decision-making process, including shutdown and external event initiators. The WCAP methodology requires that when you are only using an internal events probability risk assessment, the expert panel should be provided with information on how the failures of the pipe segments could affect functions relied upon to mitigate external events. Please provide a sample of the information that the expert panel received to help them incorporate external events into their decision making process.

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Tennessee Valley Authority

BROWNS FERRY NUCLEAR PLANT

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