January 14, 2003

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: SEQUOYAH UNIT 2 — TECHNICAL ASSESSMENT OF MINOR REACTOR VESSEL HEAD MATERIAL WASTAGE (TAC NO. MB4579)

Dear Mr. Scalice:

The purpose of this letter is to communicate the U.S. Nuclear Regulatory Commission (NRC) understanding of the technical issues related to the discovery of minor wastage of the Sequoyah Nuclear Plant Unit 2 (SQN2) reactor pressure vessel (RPV) head. In addition, this letter includes the bases for the NRC staff's assessment that the Tennessee Valley Authority's (TVA's, the licensee's) decision to restart the unit after inspection, evaluation and cleaning of the wastage area provided reasonable assurance that public health and safety were maintained.

On December 26, 2002, at 4:20 p.m., SQN2 tripped from 100 percent power as a result of low reactor coolant system (RCS) flow. The low RCS flow was the result of a trip of Reactor Coolant Pump No. 3 (RCP3) due to a ground in the RCP motor winding. After the unit tripped, all systems responded as designed and the unit was taken to Mode 3 (hot standby). TVA initiated an investigation to locate the source of minor RCS or other containment systems leakage. During this inspection TVA found an accumulation of boric acid at a leak in a reactor vessel level indication system (RVLIS) compression fitting. That leakage seeped through seams in the insulation, onto the RPV head, causing minor material wastage of the RPV head. The material wastage area was about 5 inches long and 5/16-inch wide with a maximum depth of 1/8-inch. Additional TVA inspection identified a less-significant leak through a canopy seal weld on an empty control rod drive mechanism penetration. The Senior Resident Inspector at SQN2 monitored the activities, investigations and repair efforts in accordance with the Reactor Oversight Program.

In light of the ongoing generic issue discussed in Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity," NRC staff assessed the information available from TVA's examination of the RPV head wastage area. This information included TVA's preliminary Engineering Evaluation of leaks and the minor wastage of the RPV head.

A conference call between NRC and your staff was held on January 3, 2003. During this call, no immediate safety concerns were identified and TVA answered the staff's questions satisfactorily. The questions discussed in the conference call were transmitted to you in a letter dated January 3, 2003 [ADAMS Accession Number ML030030863]. Mr. Pedro Salas of your staff agreed to respond on the docket within 30 days. The questions are attached and identify the scope of the staff's concerns.

The cognizant NRC staff organizations concluded: (1) that the structural integrity of the RPV was acceptable and no immediate safety concerns existed, (2) that the generic implications should be reviewed for a possible information notice, and (3) that the projected consequences, had the leakage not been discovered until the next scheduled refueling outage, should be addressed. A question related to the last item was included with the letter that was issued to you on January 3, 2003.

As a result of satisfactory inspection activities by NRC regarding the minor extent of the condition, the repair of both leaks, the adequacy of the initial RPV structural integrity evaluation, and the lack of immediate safety concerns, NRC staff found that TVA's actions to address the minor RPV head wastage issue provided reasonable assurance that public health and safety were maintained and it was, therefore, acceptable for SQN2 to start up as scheduled.

The NRC staff appreciates your staff's prompt and effective assistance in resolving staff concerns and questions in this matter. Should you have any questions or concerns, please feel free to contact Ms. Eva Brown at (301) 415-2315 or Mr. Raj Anand at (301) 415-1146.

Sincerely,

/RA/

Raj K. Anand, Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-328

Enclosure: Conference Call Questions

cc w/encl: See next page

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Sincerely,

/RA/

Raj K. Anand, Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

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Mr. J. A. Scalice
Tennessee Valley Authority

SEQUOYAH NUCLEAR PLANT

cc:
Mr. Karl W. Singer, Senior Vice President
Nuclear Operations
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Mr. James E. Maddox, Acting Vice President
Engineering & Technical Services
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Mr. Richard T. Purcell
Site Vice President
Sequoyah Nuclear Plant
Tennessee Valley Authority
P.O. Box 2000
Soddy Daisy, TN 37379

General Counsel
Tennessee Valley Authority
ET 11A
400 West Summit Hill Drive
Knoxville, TN 37902

Mr. Robert J. Adney, General Manager
Nuclear Assurance
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Mr. Mark J. Burzynski, Manager
Nuclear Licensing
Tennessee Valley Authority
4X Blue Ridge
1101 Market Street
Chattanooga, TN 37402-2801

Mr. Pedro Salas, Manager
Licensing and Industry Affairs
Sequoyah Nuclear Plant
Tennessee Valley Authority
P.O. Box 2000
Soddy Daisy, TN 37379

Mr. D. L. Koehl, Plant Manager
Sequoyah Nuclear Plant
Tennessee Valley Authority
P.O. Box 2000
Soddy Daisy, TN 37379

Senior Resident Inspector
Sequoyah Nuclear Plant
U.S. Nuclear Regulatory Commission
2600 Igou Ferry Road
Soddy Daisy, TN 37379

Mr. Lawrence E. Nanney, Director
Division of Radiological Health
Dept. of Environment & Conservation
Third Floor, L and C Annex
401 Church Street
Nashville, TN 37243-1532

County Executive
Hamilton County Courthouse
Chattanooga, TN 37402-2801

Ms. Ann P. Harris
341 Swing Loop Road
Rockwood, Tennessee 37854

CONFERENCE CALL QUESTIONS

REACTOR PRESSURE VESSEL HEAD MATERIAL WASTAGE

SEQUOYAH NUCLEAR PLANT, UNIT 2

DOCKET NO. 50-328

1. There are apparently two leak sources: (1) through an RVLIS [reactor vessel level indication system] mechanical joint and (2) through a conoseal or CRDM [control rod drive mechanism] penetration. What was the impact of these two separate leakage sources (i.e., what was the extent of the degradation)? How long have there been leaks from these two sources and how was that determined?

2. It was communicated that degradation on the upper head is somewhat groove-like, about 5-inches long, and 1/8-inch deep. This morphology is not typical for wastage caused by boric acid; please provide more details to describe the morphology of the degradation. Is the extent of the degradation consistent with expectations with respect to head temperatures, exposure time, etc.?

3. What is the trend of RCS [reactor coolant system] unidentified leakage since the last refueling outage and how well does the amount of boron recovered correlate to the known trend of RCS unidentified leakage? What is the location of insulation seams in the vicinity of this degradation? What is the distance between the leaking RVLIS mechanical joint and the top of the reactor vessel head? What is the approximate temperature of this joint? What is the general equipment configuration in the area of this joint with respect to ventilation in the area and the leak path for the leaking RCS fluid given ventilation in the area?

4. Explain why the Westinghouse fatigue evaluation focuses on one additional startup and shutdown cycle.

5. How was the extent of the degradation evaluated? For example, it looks like some borated water could have contacted the RV flange bolts. How was this assessed if the bolts were not removed for inspection?

6. What caused TVA [Tennessee Valley Authority] to inspect the RV head? Was there a licensing commitment, TS [Technical Specification] requirement, or some other vehicle that caused them to inspect? What was the amount of unidentified leakage at the time of shutdown? When was the last time TVA inspected the head and what did the inspection consist of (e.g., bare metal visual)? What would have been the consequences had the inspections not been performed, the borated water leakage identified, corrected, and cleaned up?

Enclosure