Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37384-2000

March 4, 2003

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of) Docket No. 50-328
Tennessee Valley Authority)

SEQUOYAH NUCLEAR PLANT (SQN) - UNIT 2 - REQUEST FOR ENFORCEMENT DISCRETION FOR TECHNICAL SPECIFICATION (TS) LIMITING CONDITIONS FOR OPERATION (LCO) 3.6.1.9, CONTAINMENT VENTILATION SYSTEM (PURGE VALVE LEAKAGE)

This letter documents our request for enforcement discretion for Unit 2 TS LCO 3.6.1.9, "Containment Ventilation System." Enforcement discretion was needed to prevent an unnecessary plant shutdown as a result of leakage as measured on February 27, 2003, above TS acceptance criteria through purge valves (2-FCV-30-50 and -51) associated with containment penetration X-6. The excessive leakage was discovered during performance of quarterly leakage test Surveillance Requirement (SR) 4.6.1.9.3. The most recent leakage rate was measured at approximately 30 standard cubic feet per hour (scfh). This leakage rate exceeds the TS allowable leakage rate (11.25 scfh [0.05 L_a]) for purge valves but remains within the TS allowable leakage for containment penetrations (135 scfh [0.6 L_a] for Type B and C penetrations).

TVA has initiated measures to identify the source of valve leakage and to repair/replace the suspect valve(s). TVA estimates 144 additional hours are needed to complete these activities in lieu of Unit 2 shutdown. As discussed with NRC staff during a telephone conference on February 28, 2003, TVA initiated compensatory measures to administratively control plant activities and minimize containment leakage during the valve repair/replacement activities. During that telephone call, NRC granted TVA's verbal request for enforcement discretion.

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TS action time for LCO 3.6.1.9 requires the valve to be "restored to OPERABLE status within 24 hours, otherwise be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours." The requested allowed outage time for repair of these valves (in excess of the 24 hours) includes leak testing and inspections necessary to return the valves to operable status following repair/replacement.

SQN Unit 2 entered TS Action (b) of LCO 3.6.1.9 at 1851 Eastern standard time (EST) on February 27, 2003.

Detailed justification for the enforcement discretion is provided in the enclosure.

There are no commitments contained in this submittal. Please direct questions concerning this issue to me at (423) 843-7170 or J. D. Smith at (423) 843-6672. This letter documents the verbal request TVA made and received for enforcement discretion on February 28, 2003.

Sincerely,

Pedro Salas
Licensing and Industry Affairs Manager

Enclosure
cc: See page 3

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ENCLOSURE

TENNESSEE VALLEY AUTHORITY
SEQUOYAH NUCLEAR PLANT (SQN)
UNIT 2
DOCKET NO. 328

REQUEST FOR ENFORCEMENT DISCRETION FOR TECHNICAL SPECIFICATION (TS) LIMITING CONDITIONS FOR OPERATION (LCO) 3.6.1.9

BACKGROUND

During performance of the quarterly TS Surveillance Requirement (SR) 4.6.1.9.3 on Unit 2, leakage above TS acceptance criteria was discovered from Containment Penetration X-6. Containment Penetration X-6 contains two 24-inch air-operated purge exhaust valves (2-FCV-30-50 and -51). The purge valves are located on either side of Containment Penetration X-6 in lower containment (inboard valve FCV-30-50 is located inside containment and outboard valve FCV-30-51 is located outside containment in the annulus area). The valves have a dual function to purge containment as part of the containment ventilation system (purge exhaust) and to isolate Containment Penetration X-6 following a design basis accident (DBA) as part of the containment isolation system.

SQN's containment ventilation system (reactor building purge system) provides mechanical ventilation of the primary containment (upper and lower), the instrument room (located inside containment) and the annulus area located between the steel containment vessel and the concrete shield building. The system is designed to supply fresh air for breathing and contamination control to allow personnel access for maintenance and refueling activities. The system consists of two purge air supply fans and two purge air exhaust fans for the containment and annulus areas. The purge system also consists of dampers, piping, and containment purge isolation valves. The SQN purge system containment isolation valves are air-operated Henry Pratt Mark II butterfly valves.

Each purge penetration is designed to isolate upon a containment isolation signal or upon detection of high radiation in the purge exhaust. The shield building isolation valves are not considered as containment isolation valves; however, these valves also close upon a containment isolation signal, if open. For a complete system description, refer to Sections 9.4.7 and 6.2 of the SQN Updated Final Safety Analysis Report (UFSAR).

1. ***The TS or other license conditions that will be violated.***

SQN TS LCO 3.6.1.9, Containment Ventilation System, contains the requirements that state:

> "One pair (one purge supply line and one purge exhaust line) of containment purge system lines may be open; the containment purge supply and exhaust isolation valves in all other containment purge lines shall be closed. Operation with purge supply or exhaust isolation valves open for either purging or venting shall be limited to less than or equal to 1000 hours per 365 days. The 365 day cumulative time period will begin every January 1."

TS SR 4.6.1.9.3 states:

> "At least once per 3 months, each containment purge supply and exhaust isolation valve shall be demonstrated OPERABLE by verifying that the measured leakage rate is less than or equal to 0.05 L_a.*"
>
> * Enter the ACTION of LCO 3.6.1.1, "Primary Containment" when purge valve leakage results in exceeding the overall containment leakage rate acceptance criteria.

The applicable TS Action (ACTION b) for LCO 3.6.1.9 states:

> "With a containment purge supply and/or exhaust isolation valve having a measured leakage rate in excess of 0.05 L_a, restore the inoperable valve to OPERABLE status within 24 hours, otherwise be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours."

In order to allow adequate time to complete valve repair/replacement and leak testing for return to operability, enforcement discretion is being requested to allow an additional 144 hours of TS allowed outage time (AOT).

2. ***The circumstances surrounding the situation, including apparent root causes, the need for prompt action and identification of any relevant historical events.***

On February 27, 2003, during performance of SR 4.6.1.9.3 (containment local leak rate test), as-found leakage was measured through Containment Penetration X-6 in the amount of 29.63 standard cubic feet per hour (scfh). The TS acceptance criteria for purge valve leakage is 0.05 L_a (i.e., 11.25 scfh). The apparent root cause for the leakage above TS

acceptance criteria was not known initially but was suspected to be wear/damage to the resilient seat in the valve body. Subsequent investigation has identified a broken key on the valve stem for inboard purge valve 2-FCV-30-50. The investigation of this failure is ongoing. Prompt action is needed to allow continued operation of Unit 2 to avoid an undesirable and unnecessary shutdown transient that is not justified by the safety consequences and operational risk impacts a shutdown transient imposes.

SQN has not experienced similar or relevant history for excess purge valve leakage.

3. ***The safety basis for the request, including an evaluation of the safety significance and potential consequences of the proposed course of action. This evaluation should include at least a qualitative risk assessment using both risk insights and informed judgments, as appropriate.***

The containment purge isolation valves close within 4 seconds of a loss of coolant accident (LOCA) DBA (Section 9.4.7.3 of the UFSAR) and the consequences of a LOCA DBA with containment purge initially in operation is evaluated in Section 15.5.3 of the UFSAR. The increased leakage from the purge valves does not affect their ability to remain closed, that is, perform their safety function as described in the UFSAR. In addition, because containment leakage remains at approximately 34 scfh (30 scfh from penetration X-6 plus 4 scfh combined from other containment Type B and C penetrations), this leakage is much less than the TS limit for Type B and C penetrations which is 0.6 L_a (135 scfh). In addition the overall containment leakage limit is 1.0 L_a (225 scfh). Therefore, the assumptions used for the plant accident analyses are not affected by the fail-to-seal condition of the purge valves and the results of the accident analyses remain bounding.

Risk Significance:

The consequence of severe accidents is quantified in SQN's Probability Safety Assessment (PSA). In this quantification, it is assumed that the containment leaks at 1.0 L_a for all core damage events. The purge isolation valves are also modeled in the PSA assuming they are open 1000 hours per year. Should a core damage event occur with these valves initially open and they fail-to-close, a large early release occurs. The fail-to-seal condition of the purge valves does not affect (increase) the probability that they fail-to-close, therefore, the timeframe that their leakage can remain above 0.05 L_a is not time limited, provided the total containment leakage remains below 1.0 L_a.

Should a core damage event occur during the repair period, this penetration will leak at about 30 scfh. This leak rate would be considered a small early release. To ensure the leak rate from this penetration remains low enough to continue to be considered a small leak path (< L_a):

- at least one purge isolation valve in the penetration X-6 will be closed at all times, and

- the penetration will be leak rate monitored during the maintenance activity.

To offset the increase in probability of a small early release during the additional 144-hour repair activity, plant maintenance and testing schedule changes will be made. The probability of a core damage event will be reduced by moving the scheduled testing of emergency diesel generator (EDG) 2A-A outside the extended AOT. By maintaining EDG 2A-A in service and by not removing from service any system, structure, and compartment (SSCs) needed to achieve safe shutdown or mitigate an accident to the extent that the risk significance would increase above a "green" condition, the probability of a core damage event is reduced. Finally, extending this AOT will eliminate the risks associated with hurry to shutdown and subsequently restart the plant. Reducing the probability of a core damage event reduces the probability of both small and large releases.

The probability of a large early release will be reduced by not allowing any purge operations. The containment is periodically purged during power operation. This operation is modeled in the plant PSA Model. Due to the size and configuration of the containment purge paths, a failure to isolate containment purge following a core damage event results in a large early release (100 L_a). By not purging for the duration of the valve maintenance, the large early release frequency is reduced.

To reduce activity released from a non-core-damage event, the activity of the reactor coolant will be monitored to provide early detection of an adverse trend.

The repair of the leaking purge isolation valves does not result in an increase in risk (i.e., is risk neutral) because the repair configuration ensures that:

- The release from the leaking valves will remain small during the repair activity.

- The probability of a small release, from any pathway, is decreased by increasing plant resiliency (i.e., reducing the probability of a core damage event by maintaining plant mitigation equipment available) during the repair activity.

- The probability of a large release is reduced by not purging during the repair activity.

- Overall leakage from containment will be maintained well below the accident analysis and PSA Modeled normal leakage rate of L_a.

Therefore, the aggregate effect of the compensatory measures and the avoidance of plant transient are sufficient to counter balance the minimal increase in risk derived from the additional AOT requested, and make approval of the enforcement discretion risk neutral.

4. The justification for the duration of the noncompliance.

The AOT duration of 144 additional hours is TVA's estimate for repairing/replacing the purge valve(s) and performing the post-maintenance leakage test. The physical location, size, and weight of these valves require multiple rigging arrangements to perform the work activities. The temporary removal of adjacent supports results in interference that is labor intensive. The additional time period is considered reasonable based on TVA's experience for valve repair/replacement and test activities.

5. The basis for the licensee's conclusion that the noncompliance will not be of potential detriment to the public health and safety and that no significant hazard consideration is involved.

TVA has evaluated the enforcement discretion request and has determined that it does not represent a significant hazards consideration based on criteria established in 10 CFR 50.92. Operation of SQN in accordance with the proposed amendment will not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated.

   The subject valves provide redundant containment isolation barriers that ensure primary containment integrity is maintained. The maximum containment leakage rate limit is required to be less than or equal to 1.0 L_a. The maximum leakage limit associated with the subject purge valves (0.05 L_a) is a

2. conservative limit with regard to the overall containment leakage limit. In addition, the measured leakage rate is within the combined leakage rate limit for the Type B and C containment penetrations (0.60 L_a). TVA has evaluated the leakage characteristics of the subject purge valves under normal operation and under worst-case post-accident operation. The probability for the measured leakage rate to exceed the overall containment maximum allowable limit during the AOT extension time is risk neutral.

   The requested extension will not impact the plant operation. The increased out-of-service time does not invalidate the plant PSA or assumptions used in evaluating the radiological consequences of an accident. Therefore, TVA's proposed request for enforcement discretion does not involve an increase in the probability of any accident previously evaluated.

   The proposed increase in the AOT will not change the conditions, operating configuration, or minimum amount of operable equipment assumed in the plant FSAR for accident mitigation. Therefore, this request will not result in a significant increase in the consequences of an accident.

3. Create the possibility of a new or different kind of accident from any previously analyzed.

   The proposed relief to extend the AOT for allowable purge valve leakage does not alter the physical design, or configuration of the plant. Overall containment integrity will be administratively controlled during the valve repair/replacement activities, therefore, this change does not create the possibility of a new or different kind of accident from any previously analyzed.

4. Involve a significant reduction in a margin of safety.

   The plant parameters that protect against postulated accidents are not changed by the proposed extension and will continue to perform their required safety functions. In addition, the plant remains well within the safety analysis and probabilistic risk analysis assumptions. Therefore, the proposed extension does not significantly reduce the margin of safety.

6. ***The basis for the licensee's conclusion that the noncompliance will not involve adverse consequences to the environment.***

TVA has evaluated the requested enforcement discretion request against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.21. TVA has determined that the requested action meets the criteria for a categorical exclusion set forth in 10 CFR 51.22(c)(9). This determination is based on the fact that the proposed action is being requested as an enforcement discretion to a license issued pursuant to 10 CFR 50, and that the change involves no significant hazards considerations. Although the proposed action involves noncompliance with the requirements of an LCO:

(i) The proposed action involves no significant hazards consideration.

(ii) There is no significant change in the types or a significant increase in the amounts of any effluent that may be released offsite, since the proposed action does not affect the generation of any radioactive effluent nor does it adversely affect any of the permitted release paths.

(iii) There is no significant increase in individual or cumulative occupational radiation exposure. The action proposed in this request for enforcement discretion will not affect plant radiation levels, and, therefore, does not adversely affect dose rates and occupational exposure.

Accordingly, the proposed action meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9).

7. ***Any proposed compensatory measure.***

TVA has implemented compensatory measures to ensure that containment leakage remains well within the TS limits as governed by 10 CFR 50, Appendix J (i.e., 0.60 L_a for all Type B and Type C penetrations. TVA will ensure that the X-6 containment penetration flow path is administratively controlled at all times during the AOT and will not contribute to additional containment leakage beyond the allowable limits. A full description of the compensatory measures is as follows:

1) Penetration X-6 has at least one damper deactivated and closed,

2) Monitor Dose Equivalent Iodine (DEI) for adverse trend in fuel failure,

3) Monitor penetration leakage during valve repair and proceed with shutdown action of LCO 3.6.1.9.b if leakage reaches or exceeds 0.6 L_a (local leakage rate test as tested during repair work),

4) No containment purging activities during extension actions implemented,

5) No planned activities that could cause core damage frequency to increase to yellow or greater,

6) Move EDG 2A-A surveillance instruction to outside the extension application of the enforcement discretion.

8. A statement that the request has been approved by the facility organization that normally reviews safety issues (Plant On-site Review Committee, or its equivalent).

The proposed request for enforcement discretion has been reviewed and approved by the Plant Operations Review Committee.

9. The request must specifically address which of the NOED criteria for appropriate plant conditions specified in Section B is satisfied and how it is satisfied.

This enforcement discretion request meets Criterion 1(a) of Section B, Paragraph 2.0 of NRC Inspection Manual, Part 9900. This criteria is satisfied in that a unit shutdown would be required by complying with the TS requirements of Specification 3.6.1.9. The proposed enforcement discretion will minimize potential safety consequences and operational risks associated with the undesirable transients associated with power reduction activities.

10. If a follow-up license amendment is required, both the written NOED request and the license amendment request must be submitted within 2 working days. The license's amendment request must describe and justify the exigent circumstances (see 10 CFR 50.91(a)(6)).

The requested enforcement discretion will be a one-time temporary alteration to the TS requirements and will not require a permanent revision to the TS requirements. Therefore, a permanent TS change is not applicable to this request or necessary to terminate the provisions requested.

11. ***For severe weather or other natural phenomena-related NOEDs, the licensee's request must be sufficiently detailed for the staff to evaluate the likelihood that the event could affect the plant, the capability of the ultimate heat sink, on-site and off-site emergency preparedness status, access to and from the plant, acceptability of any increased radiological risk to the public and the overall public benefit. In addition to items 1-10 above, as appropriate, the licensee must provide:***

    a. ***details of the basis and nature of the emergency; potential consequences of compliance with the license conditions to the plant and the emergency situation. The licensee must provide the name, organization and telephone number of the official who made the emergency assessment.***

    b. ***status, and potential challenges to off-site and on-site power sources, and the impact of the emergency on plant safety.***

    c. ***demonstrated actions taken to avert and/or alleviate the emergency situation, including steps taken to avoid being in the noncompliance, as well as efforts to minimize grid instabilities (e.g., coordinating with other utilities and the load dispatcher organization for buying additional power or for cycling load, or shedding interruptible industrial or non-emergency loads).***

Not Applicable