October 21, 2008

10 CFR 50.59(c)(2)
TVA-SQN-TS-08-06 10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Gentlemen:

In the Matter of	)	Docket Nos. 50-327
Tennessee Valley Authority (TVA)	)	50-328

SEQUOYAH NUCLEAR PLANT (SQN) - UNITS 1 AND 2 - "LICENSE AMENDMENT REQUEST (LAR) TS-08-06 TO REVISE ICE CONDENSER LICENSING BASIS"

Pursuant to 10 CFR 50.90, Tennessee Valley Authority (TVA) is submitting a request for an amendment (TS-08-06) to Licenses DPR-77 and DPR-79 for SQN. The proposed amendment will modify the SQN Updated Final Safety Analysis Report (UFSAR) by requiring an inspection of each ice condenser within 24 hours of experiencing a seismic event greater than or equal to an Operating Basis Earthquake (OBE) within the 5-week period after ice basket replenishment has been completed.

The intent of the proposed change is to confirm that adverse ice fallout has not occurred, which could impede the ability of the ice condenser lower inlet doors to open. This action would be taken in order to ensure the generic qualification of the ice condenser containment design is maintained in accordance with Topical Report WCAP-8110, Supplement 9A, which is referenced in the SQN UFSAR.

TVA has determined that there are no significant hazards considerations associated with the proposed change and that the UFSAR change qualifies for categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and enclosure to the Tennessee State Department of Public Health.

TVA does not have specific schedule needs for this proposed change and processing can be pursued as appropriate.

The UFSAR revision was reviewed in accordance with the requirements of 10 CFR 50.59, "Changes, Tests and Experiments." Based on this review, it was concluded that a license amendment is required in accordance with 10 CFR 50.59(c)(2).

Revisions to the SQN UFSAR will be made in accordance with 10 CFR 50.71(e).

A listing of regulatory commitments is provided in Attachment 1.

If you have any questions about this change, please contact me at (423) 843-7170.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 21st day of October, 2008.

Sincerely,

James D. Smith
Manager, Site Licensing and
Industry Affairs

Enclosure:
Evaluation of the Proposed Change

cc: See page 3

Enclosure
cc (Enclosure):

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ENCLOSURE

EVALUATION OF THE PROPOSED CHANGE

Subject: Application for license amendment to revise the Ice Condenser Licensing Basis to include requiring the inspection of each ice condenser within 24 hours of experiencing a seismic event greater than or equal to an Operating Basis Earthquake (OBE) within the 5-week period after ice basket replenishment.

1.0 SUMMARY DESCRIPTION

This evaluation supports a license amendment request (LAR) to amend Operating Licenses DPR-77 and DPR-79 for SQN Units 1 and 2.

The proposed change would revise SQN's Updated Final Safety Analysis Report (UFSAR) to require an inspection of each ice condenser within 24 hours of experiencing a seismic event greater than or equal to an OBE (OBE is defined as 1/2 of a Safe Shutdown Earthquake [SSE]) within the 5-week period after ice basket replenishment is completed. This will confirm that ice condenser lower inlet doors have not been blocked by ice fallout.

The proposed amendment provides a procedural requirement to confirm the ice condenser maintains the ice condenser generic qualification as set forth in the UFSAR. Justification for the use of the proposed procedural requirement is based on reasonable assurance that the ice condenser lower inlet doors will open following a seismic event during the 5-week period and the low probability of a seismic event occurring coincident with or subsequently followed by a Design Basis Accident (DBA).

In 2007, an NRC Region III Inspector identified a potential concern that typical ice condenser maintenance practices at Donald C. Cook Nuclear Plant (CNP) did not ensure compliance with the licensing basis for ice fusion time requirements in that procedures do not recognize a 5-week storage period for freshly loaded ice baskets prior to power ascension.

TVA began discussions with the other ice condenser plant licensees (CNP and Duke Power Company) and Westinghouse Electric Company regarding the ice fusion concern. The ice fusion issue was discussed in a public meeting at NRC Headquarters on December 12, 2007. Consistent with those discussions, TVA has elected to change the SQN UFSAR as described above to address the ice fusion concerns.

2.0 DETAILED DESCRIPTION

The SQN ice condenser consists of a completely enclosed annular compartment located around approximately 300 degrees of the perimeter of the upper compartment of the containment, but penetrating the operating deck so that a portion extends into the containment lower compartment. The lower portion has a series of hinged doors (lower inlet doors) exposed to the atmosphere of the lower containment compartment and designed to remain closed during normal plant operation. At the top of the ice condenser is another set of doors (top deck doors) that are exposed to the atmosphere of the upper compartment; these doors also remain closed during normal plant operation. Intermediate deck doors are located below the top deck doors. These doors

form the floor of a plenum at the upper part of the ice condenser and remain closed during normal plant operation. Within the ice condenser, ice is held in baskets arranged to promote heat transfer to the ice. During normal plant operation, the ice condenser performs no function and is not required for a controlled shutdown of the unit.

The ice condenser is structurally designed to withstand an SSE plus a DBA.

In the event of a loss-of-coolant accident (LOCA) or high energy line break (HELB), which includes a steam or feedwater line break inside containment, the pressure rises in the lower compartment and the ice condenser lower inlet doors open. This allows air and steam to flow from the lower compartment into the ice condenser. The resulting pressure increase within the ice condenser causes the intermediate deck doors and the top deck doors at the top of the ice condenser to open, allowing air to flow out of the ice condenser into the upper compartment. Steam entering the ice condenser is condensed by the ice, thus limiting the peak pressure and temperature buildup in containment. Condensation of steam within the ice condenser allows a continual flow of steam from the lower compartment to the condensing surface of the ice, thus reducing the lower compartment pressure.

Sufficient ice heat transfer surface and flow passages are provided in the ice condenser so that the magnitude of the pressure transient resulting from an accident does not exceed the containment design pressure. The lattice frame and support column assemblies allow passage of steam and air through the space around the ice baskets.

The floor drains are passive structural components during normal operation. During a small pipe break, the condensed steam and melted ice will collect on the floor of the ice condenser and then flow out through the drains. For intermediate and large pipe breaks, water will drain through both the lower inlet doors and the drains.

The lower inlet doors are provided with shock absorber assemblies to dissipate the kinetic energy generated by opening the doors during a large pipe break scenario.

As part of the ice condenser qualification program, seismic testing of ice baskets was conducted at the Westinghouse Waltz Mill facility to determine the amount of ice fallout from ice baskets subjected to simulated plant time history seismic disturbances.

Ice condenser qualification program test results were reported in WCAP-8110, "Test Plans and Results for the Ice Condenser System," and ten supplements. Supplement 9 to the WCAP, entitled "Ice Fallout From Seismic Testing of Fused Ice Basket," addresses ice retention during a seismic event.

This document describes the test apparatus and methodology for verifying that flaked ice will be retained in an ice basket subjected to cumulative worst-case SSE seismic loading. In the Atomic Energy Commission's (AEC [now NRC]) evaluation of WCAP-8110, Supplement 9, dated November 21, 1974, (renamed WCAP-8110, Supplement 9-A) it is stated that a flaked ice basket stored for at least 5-weeks exhibited adequate retention capability when subjected to Design Basis [Safe Shutdown] Earthquake seismic response spectra.

The AEC's November 21, 1974 letter, included within WCAP-8110, Supplement 9-A, contains the following statement: "As a result of our review, we have concluded that the data presented in WCAP-8110 Supplement 9 (the Westinghouse test report) are adequate to conclude that land-based plants using ice condenser type containments

should begin their initial ascent to power after a minimum of 5-weeks following ice loading." The same November 21, 1974 letter, accepts the document as a topical report which may be referenced in license applications. SQN's UFSAR references WCAP-8110, Supplement 9-A as part of the generic qualification of the ice condenser containment design.

The term "ice fusion" refers to a condition established when an ice basket freshly loaded with flake ice achieves stability at the operating temperature of the ice condenser, i.e., when the ice freezes or otherwise solidifies such that it tends to stay in the ice basket when agitated. If the ice were not sufficiently fused during a seismic event, it is possible that ice could fall from the ice baskets and impede the ability of the ice condenser lower inlet doors to open.

In order for the ice condenser to perform its energy absorption and pressure mitigation functions, the ice condenser lower inlet doors must open to allow the mass release from a LOCA or HELB to enter the ice condenser, and the ice bed ice mass and geometry must be adequate to support heat transfer to the ice bed.

3.0 TECHNICAL EVALUATION

10 CFR 50.59(a)(6) defines a test or experiment not described in the UFSAR to mean any activity where a structure, system, or component is utilized or controlled in a manner which is either: (i) outside the reference bounds of the design basis as described in the UFSAR, or (ii) inconsistent with the analyses or descriptions in the UFSAR.

In this case, the reference bounds of the design basis are incorporated by reference to WCAP-8110, Supplement 9-A in the SQN UFSAR. The reference bounds of the design basis is: "land-based plants using ice condenser type containments should begin their initial ascent to power after a minimum of 5 weeks following ice loading." This bounding waiting period assures that ice in the ice baskets will be sufficiently fused such that ice fall out during an SSE does not impede the ice condenser's design function. The activity to be analyzed is the ability for the SQN units to start an ascent to power operations without waiting for the bounding 5-week period if an alternate method of meeting the requirement is utilized for either a complete charging of the ice bed or following routine ice bed servicing.

10 CFR 50.59 (c)(1) states, in part, that the licensee may make changes to the licensed facility as described in the UFSAR and conduct tests and experiments not described in the UFSAR without obtaining a license amendment only if the changed test or experiment does not meet the criteria in paragraph (c)(2) of this section.

10 CFR 50.59 (c)(2) states, in part, that the licensee shall obtain a license amendment pursuant to 10 CFR 50.90 prior to implementing a proposed test or experiment which would: (ii) result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the UFSAR; or (viii) result in a departure from a method of evaluation described in the UFSAR used in establishing the design basis or in the safety analyses.

A review of the activity showed that the criterion for a license amendment was met. Thus, a request for an alternate means of meeting the requirements is described below:

The current text of the SQN UFSAR, Section 6.5.9.1, entitled "Lower Inlet Doors, Design Basis, Interface Requirements," reads as follows:

Sufficient clearance is required for the doors to open into the ice condenser. Items to be considered in this interface are floor clearance, lower support structure clearance and floor drain operation.

The proposed revision to this paragraph reads as follows:

Original ice basket qualification testing (Topical Report WCAP-8110, Supplement 9-A), has shown freshly loaded ice is considered fused after 5 weeks. In the event of an earthquake (OBE or greater) which occurs within 5 weeks following the completion of ice basket replenishment, plant procedures require a visual inspection of applicable areas of the ice condenser within 24 hours to confirm that opening of the ice condenser lower inlet doors is not impeded by any ice fallout resulting from the seismic disturbance. The 24 hour time frame for inspection is applicable during modes where the lower inlet doors are required to be operable, otherwise perform this inspection prior to startup. This alternative method of compliance with the requirements of General Design Criteria (GDC) 2 is credible based upon the reasonable assurance that the ice condenser doors will open following a seismic event during the 5 week period and the low probability of a seismic event occurring coincident with or subsequently followed by a Design Basis Accident.

Under the proposed change to the licensing basis, power ascension and normal plant operation could occur for a period of up to 5 weeks prior to achieving full qualification of the ice condenser as defined in the current licensing basis. One of 5 scenarios could occur during this “period of potential exposure,” specifically:

i. No seismic disturbance, LOCA or HELB occurs

ii. A seismic disturbance occurs without a LOCA or HELB occurring

iii. LOCA or HELB occurs without a seismic disturbance

iv. A seismic disturbance occurs coincident with a LOCA or HELB

v. A seismic disturbance occurs with a subsequent LOCA or HELB

Under the first three scenarios, there is no impact as a result of the proposed change. In the first two scenarios, the ice condenser would not be called upon to perform an accident mitigation function. In the third scenario, although the ice condenser would be called upon to mitigate an accident, absent a seismic disturbance, there is no driver to dislodge ice, and the ice condenser would function as designed.

In the fourth and fifth scenarios, if a LOCA or HELB occurred coincident with, or subsequent to a seismic disturbance, it is possible that ice in freshly loaded ice baskets could fall out. However, several factors provide defense-in-depth and tend to mitigate the safety significance of the proposed change:

- There is Reasonable Assurance That the Ice Condenser Would Function Following a Seismic Event

  Reduction in total ice mass:

  The basis of the current 5-week ice fusion time requirement was derived from qualification testing (c. 1974) conducted by Westinghouse Electric

Company during development and licensing of ice condenser containments. Determination of a minimum ice fusion time was not an objective of the test program.

As a result of the review of test results captured in WCAP 8110, Supplement 9, the Ice Condenser Utility Group (I&M, TVA and Duke) concluded that the 5-week ice fusion time selected as the licensing basis was conservative and that ice condenser design has substantial margin with respect to ice fallout. A key consideration in reaching this conclusion was inherent conservatisms in the 1974 test program:

- The test baskets floated freely in the lattice frames and were not fixed at one end. The floating end exacerbates the movement resulting from application of a given seismic excitation, which would tend to overstate the ice fallout in the test compared to expected fallout from an actual plant event.
- The test basket was only six feet tall and had an open top, whereas an actual ice condenser basket typically consists of four vertically stacked twelve-foot sections, with only the uppermost section having an open top. The majority of ice fallout during the tests occurred from the open top of the basket. Since proportionally less ice would be expected to fall out of the lower sections of an actual ice condenser basket, the percentage of ice falling out of the test basket section overstates what would be expected during an actual plant event.

Flow channel blockage:

The successful completion of SQN Technical Specification Surveillance Requirement 4.6.5.1.b ensures that the ice accumulation on the structural steel members comprising flow channels through the ice bed is less than or equal to a 15 percent blockage of the total flow area for each safety analysis section.

Therefore, it can be reasonably assumed that any loose, granular ice that would be shaken free during a seismic event from a recently replenished ice basket cannot block flow passages that were verified to be at least 85 percent clear during the preceding surveillance inspection.

Restriction of lower inlet door movement:

The SQN ice condenser baskets typically consists of four vertically stacked twelve-foot sections, with only the uppermost section having an open top. The majority of ice fallout during the tests occurred from the open top of the basket. Since ice fallout at SQN could only occur from the top portion of the uppermost basket, the quantity of ice that could fallout in a seismic event is much less than estimated in the tests. The quantity of ice that falls out would be loose, and therefore unlikely to block the inlet doors. The inspection of the ice condenser doors within 24 hours of a seismic event provides assurance that the ice fallout would not be a sufficient quantity or in a fused state that could block the free movement of the ice doors.

Floor drain blockage:

> As discussed in the SQN UFSAR, containment peak pressure is not affected by drain performance impacted by ice accumulation due to a seismic event. There are a total of 20 ice condenser floor drains among the 24 ice condenser bays. The ice condenser design is such that for blockage of any floor drain, water would flow to adjacent bays and eventually would spill over the lower inlet door openings if necessary. Additionally, any ice on the floor of the ice condenser would be melted by the rise in temperature of the ice condenser and flowing meltwater.

In conclusion, there is reasonable assurance that the ice condenser would function properly following a seismic event within the 5 week period due to inherent conservatisms in the 1974 test data, the low likelihood of flow channel and floor drain blockage, and improbable blocking of the lower inlet doors by any potential fallout.

- The Probability of a Seismic Disturbance Coincident With or Subsequently Followed by a LOCA or HELB is Low

  The proposed amendment revises the SQN UFSAR by requiring an inspection of each ice condenser within 24 hours of experiencing a seismic event greater than or equal to an OBE within the 5-week period after the completion of ice basket replenishment to confirm that adverse ice fallout has not occurred which could impede the ability of the ice condenser lower inlet doors to open. This action would be taken in order to ensure the generic qualification of the ice condenser containment design is maintained in accordance with Topical Report WCAP-8110, Supplement 9A, which is referenced in the SQN UFSAR.

  Although this license amendment request is not presented as a risk-informed change under the guidance of Regulatory Guide 1.174, “An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis,” consideration of the probability of occurrence provides an insight into the very small risk involved in the proposed change.

  The annual probability of exceedance for the OBE level earthquake at Sequoyah was derived from EPRI RP 101-53 (EPRI NP-6395-D), "Probabilistic Seismic Hazard Evaluation." The ice condenser was conservatively assumed to be required by the applicable operating mode for the entire 5-week fusion period. The probability that the ice condensers doors could become impeded during the 5-week period was computed. The likelihood of a LOCA or HELB, which would require the ice condenser, following the impediment was then estimated with time constraints as noted below. The ice condenser inspection is required within 24 hours. If the ice condenser lower inlet doors are determined to be impeded and cannot be restored, the unit must be in Mode 5 within the next 37 hours. Therefore, the total exposure time for consideration of a subsequent event is 61 hours. The frequency of LOCAs and HELBs were derived from NUREG/CR-6928, “Industry-Average Performance for Components and Initiating Events at U.S. Commercial Nuclear Power Plants” and NUREG/CR-5750, "Rates of Initiating Events at U.S. Nuclear Power Plants: 1987 - 1995."

  As a result, the probability of ice condenser impairment and subsequent

challenge is estimated to be less than 3.89E-09 for Sequoyah during the “period of potential exposure.” This is a very low probability as would be expected by the nature of the events.

Approval of the proposed amendment is justifiable based upon the low probability that a LOCA or HELB would occur coincident with or subsequent to an OBE (while the plant is shutting down) during the “period of potential exposure.” After the 5-week fusion time has been reached, the Westinghouse Topical Report WCAP-8110, Supplement 9-A test report concludes that acceptable levels of ice fallout occur for all expected seismic events, up to and including the SSE.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

The proposed inspection of each ice condenser within 24 hours of experiencing a seismic event equal to or greater than an OBE within the 5-week period after ice basket replenishment provides an alternate method of confirming that the lower inlet doors would open subsequent to a seismic event. Justification for the use of the proposed procedural requirement is based upon reasonable assurance that the ice condenser doors would function following a seismic event, and the low probability of a seismic event coincident with, or immediately followed by a DBA.

This LAR does not alter or revise the current bounding safety analyses of record in any way. Consequently, SQN will remain in compliance with the applicable regulations and requirements. These are:

- 10 CFR50, Appendix A, General Design Criterion (GDC) 2, "Design Basis For Protection Against Natural Phenomena,“ which requires that structures, systems and components important to safety be designed to withstand the effects of natural phenomena such as earthquakes;

- GDC 16, "Containment Design," which requires that the reactor containment and associated systems provide an essentially leak-tight barrier against the uncontrolled release of radioactivity to the environment;

- GDC 38, "Containment Heat Removal," which requires that a system be provided to remove heat from the reactor containment; and

- GDC 50, "Containment Design Basis," which requires that the reactor containment structure be designed with conservatism to accommodate applicable design parameters (pressure, temperature, leakage rate).

This LAR is being submitted in accordance with 10 CFR 50.90.

4.2 Precedent

The NRC approved a similar license amendment request from Indiana Michigan Power, the licensee for Donald C. Cook Nuclear Plant (CNP) Units 1 and 2, on April 16, 2008. The NRC approved a similar license amendment request from Duke Power Company for McGuire Nuclear Station on April 2, 2008. The SQN proposed change is consistent with these amendments.

4.3 Significant Hazards Consideration

The proposed inspection of each ice condenser within 24 hours of experiencing a seismic event equal to or greater than an Operating Basis Earthquake (OBE) within the 5-week period after ice basket replenishment provides an alternate method of confirming that the lower inlet doors would open subsequent to a seismic event. Justification for the use of the proposed methodology is based upon reasonable assurance that the ice condenser doors would function following a seismic event, and the low probability of a seismic event coincident with, or immediately followed by a Design Basis Accident (DBA).

TVA has evaluated whether or not a significant hazards consideration is involved with the proposed amendments by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment," as discussed below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

The analyzed accidents of consideration in regard to changes potentially affecting the ice condenser are a loss-of-coolant accident (LOCA) and a steam or feedwater line break inside containment. The ice condenser is an accident mitigator and is not postulated as being the initiator of a LOCA or high energy line break (HELB). The ice condenser is structurally designed to withstand a Safe Shutdown Earthquake (SSE) plus a Design Basis Accident (DBA) and does not interconnect or interact with any systems that interconnect or interact with the reactor coolant, main steam or feedwater systems. Because the proposed changes do not result in, or require any physical change to the ice condenser that could introduce an interaction with the reactor coolant, main steam or feedwater systems, there can be no change in the probability of an accident previously evaluated.

Under the current licensing basis, the ice condenser ice baskets would be considered fully fused prior to power ascension and the ice condenser would perform its accident mitigation function even if a safe shutdown seismic event occurred coincident with or just preceding the accident. Under the proposed change, there is some finite probability that, within 24 hours following a seismic disturbance, a LOCA or HELB in containment could occur within 5 weeks of the completion of ice basket replenishment. However, several factors provide defense-in-depth and tend to mitigate the potential consequences of the proposed change.

DBAs are not assumed to occur simultaneously with a seismic event. Therefore, the coincident occurrence of a LOCA or HELB with a seismic event is strictly a function of the combined probability of the occurrence of independent events, which in this case is very low. Based on the Probabilistic Risk Assessment model and seismic hazard analysis, the combined probability of occurrence of a seismic disturbance greater than or equal to an OBE during the 5-week period following ice replenishment coincident with or subsequently followed by a LOCA or HELB during the time required to perform the proposed inspection (24 hours) and if required by technical specifications, complete unit shutdown (37 hours), is less than 3.89E-09 for Sequoyah. This probability is well below the threshold that is typically considered credible.

Even if ice were to fall from ice baskets during a seismic event occurring coincident with or subsequently followed by an accident, the ice condenser would be expected to perform its intended safety function. There is reasonable assurance that the ice condenser would function properly following a seismic event within the 5-week period due to inherent conservatisms in the 1974 test data, the low likelihood of flow channel and floor drain blockage, and improbable blocking of the lower inlet doors by any potential fallout.

Based on the above, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated. The ice condenser is expected to perform its intended safety function under all circumstances following a LOCA or HELB in containment.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No.

   The proposed change affects the assumed timing of a postulated seismic and DBA applied to the ice condenser and provides an alternate methodology to confirm the ice condenser lower inlet doors are capable of opening. As previously discussed, the ice condenser is not postulated as an initiator of any DBA. The proposed change does not impact any plant system, structure or component that is an accident initiator. The proposed change does not involve any hardware changes to the ice condenser or other changes that could create new accident mechanisms. Therefore, there can be no new or different accidents created from those previously identified and evaluated.

   Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

   Response: No.

Margin of safety is related to the confidence in the ability of the fission product barriers to perform their design functions during and following an accident situation. These barriers include the fuel cladding, the reactor coolant system, and the containment system. The performance of the fuel cladding and the reactor coolant system will not be impacted by the proposed change.

The requirement to inspect the ice condensers within 24 hours of experiencing seismic activity greater than or equal to an OBE during the 5-week period following the completion of ice basket replenishment will confirm that the ice condenser lower inlet doors are capable of opening. This inspection will confirm that the ice condenser doors remain fully capable of performing their intended safety function under credible circumstances.

The proposed change affects the assumed timing of a postulated seismic and DBA applied to the ice condenser and provides an alternate methodology in confirming the ice condenser lower inlet doors are capable of opening. As previously discussed, the combined probability of occurrence of a LOCA or HELB and a seismic disturbance greater than or equal to an OBE during the "period of potential exposure" is less than 3.89E-09 for Sequoyah. This probability is well below the threshold that is considered credible.

Therefore, the proposed change does not involve a significant reduction in the margin of safety. The SQN ice condenser will perform its intended safety function under credible circumstances.

The changes proposed in this license amendment request (LAR) do not make any physical alteration to the ice condensers, nor does it affect the required functional capability of the ice condenser in any way. The intent of the proposed change to the UFSAR is to eliminate an overly restrictive waiting period prior to unit ascent to power operations following the completion of ice basket replenishment. The required inspection of the ice condenser following a seismic event greater than or equal to an OBE will confirm that the ice condenser lower inlet doors will continue to fully perform their safety function as assumed in the SQN safety analyses.

Thus, it can be concluded that the proposed change does not involve a significant reduction in the margin of safety.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, TVA concludes that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

4.4 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance

of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 REFERENCES

The following documents were consulted:

a. WCAP-8110, Supplement 9, dated May 13, 1974

b. AEC Evaluation of WCAP-8110, Supplement 9-A, dated November 21, 1974

c. Memorandum from P. S. Tam, NRC, "Summary of December 12, 2007, Meeting with I&M on the Issue of Ice Condenser Ice Fusion (TAC No. MD6756)," dated December 20, 2007 (ADAMS Accession Number ML073470330)

ATTACHMENTS

1. List of Regulatory Commitments
2. UFSAR Page Markups

ATTACHMENT 1

TENNESSEE VALLEY AUTHORITY
SEQUOYAH NUCLEAR PLANT (SQN)
UNITS 1 AND 2

LIST OF REGULATORY COMMITMENTS

Implement SQN station procedures requiring the inspection of each ice condenser within 24 hours of experiencing a seismic event greater than or equal to an Operating Basis Earthquake (OBE) within the five (5) week period after the completion of ice basket replenishment.

ATTACHMENT 2

TENNESSEE VALLEY AUTHORITY
SEQUOYAH NUCLEAR PLANT (SQN)
UNITS 1 AND 2

PROPOSED UPDATED FINAL SAFETY ANALYSIS REPORT
CHANGES (MARK-UP)

I. AFFECTED PAGE LIST

6.5-37

II. MARKED PAGES

See attached.

ice condenser. The opening rate of the inlet doors is important to insure minimizing the pressure buildup in the lower compartment due to the rapid release of energy to that compartment. The rate of pressure rise and the magnitude of the peak pressure in any lower compartment region is related to the confinement of that compartment. The time period to reach peak lower compartment pressure due to the design basis accident is approximately 0.05 seconds.

4. Doors shall be of simple mechanical design to minimize the possibility of malfunction.

5. The inertia of the doors shall be low, consistent with producing a minimal effect on initial pressure.

Design Criteria - Normal Operation

1. The doors shall restrict the leakage of air into and out of the ice condenser to the minimum practicable limit. (See Section 6.5.6.3.)

2. The doors shall restrict local heat input in the ice condenser to the minimum practicable limit. Heat leakage through the doors to the ice bed should be a total of 20,000 BTU/hr or less (for 24 pairs of doors).

3. The doors shall be instrumented to provide indication of their closed position. Testing of prototype doors has established that their normal position under zero differential pressure conditions is 3/8" ± 1/8" open.

4. Provision shall be made for adequate means of inspecting the doors during reactor shutdown.

5. The doors shall be designed to withstand earthquake loadings without damage so as not to affect subsequent ice condenser operation for normal and accident conditions. These loads are derived from the seismic analysis of the containment.

6. The door system shall provide a flow proportioning capability for small break conditions in accordance with Figure 6.5.9-1.

Interface Requirements

1. Crane wall attachment of the door frames is via studs with a compressible seal. Attachment to the crane wall is critical for the safety function of the doors.

2. Sufficient clearance is required for doors to open into the ice condenser. Items to be considered in this interface are floor clearance, lower support structure clearance and floor drain operation.

INSERT

3. Door opening and stopping forces will be transmitted to the crane wall and lower support structure, respectively.

Design Loads

Pressure loading during LOCA was provided by the Transient Mass Distribution (TMD) code from an analysis of a double-ended hot leg break in the corner formed by the refueling canal, with 100

INSERT

Original ice basket qualification testing (Topical Report WCAP-8110, Supplement 9-A), has shown freshly loaded ice is considered fused after 5 weeks. In the event of an earthquake (OBE or greater) which occurs within 5 weeks following the completion of ice basket replenishment, plant procedures require a visual inspection of applicable areas of the ice condenser within 24 hours to confirm that opening of the ice condenser lower inlet doors is not impeded by any ice fallout resulting from the seismic disturbance. The 24 hour time frame for inspection is applicable during modes where the lower inlet doors are required to be operable, otherwise perform this inspection prior to startup. This alternative method of compliance with the requirements of GDC 2 is credible based upon the reasonable assurance that the ice condenser doors will open following a seismic event during the 5 week period and the low probability of a seismic event occurring coincident with or subsequently followed by a Design Basis Accident.