January 30, 1989

Docket Nos. 50-327/328

Mr. Oliver D. Kingsley, Jr.
Senior Vice President, Nuclear Power
Tennessee Valley Authority
6N 38A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dear Mr. Kingsley

SUBJECT: CONTAINMENT ICE CONDENSER SURVEILLANCE (TAC R00417, R00418)
(TS 88-13) SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2

The Commission has issued the enclosed Amendment No. 98 to Facility Operating License No. DPR-77 and Amendment No. 87 to Facility Operating License No. DPR-79 for the Sequoyah Nuclear Plant, Units 1 and 2, respectively. These amendments are in response to your application dated July 27, 1988 as supplemented by your letter dated October 20, 1988.

These amendments modify the Sequoyah Nuclear Plant, Units 1 and 2 Technical Specifications. These changes are to revise the containment systems surveillance requirement 4.6.5.1.b.3 for both units. These changes will replace the visual inspection requirement utilizing a 0.38-inch criterion for the ice condenser system with a surveillance program to ensure that the flow blockage does not exceed 15 percent.

A copy of the Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's Bi-Weekly Federal Register Notice.

Sincerely,

Original Signed by
Suzanne Black, Assistant Director
for Projects
TVA Projects Division
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 98 to License No. DPR-77
2. Amendment No. 87 to License No. DPR-79
3. Safety Evaluation

cc w/enclosures:
See next page

*SEE PREVIOUS CONCURRENCE

DISTRIBUTION:

Docket File	RPierson	JDonohew (2)
NRC PDR	EJordan	OGC
Local PDR	FMcCoy	TMeek (8)
BCrutchfield	Wanda Jones	MSimms
DHagan	MSimms	LFMB
BDLiaw	GPA/PA	SQN Rdg
SBlack	ACRS (10)	LWatson(2)
SVarga	EButcher	SKim
JRutberg	Projects Rdg	SQN File

OFC

OFC	:OSP:TVA/LA*	:OSP:TVA/PM*	:OGC*	:TVA:AD/P	:	:	: :
NAME	:MSimms	:JDonohew	:~~EButcher~~ S Lewis	:SBlack			
DATE	:12/15/88	: 12/24/88	:01/13/89	:01/27/89	:		

OFFICIAL RECORD COPY
8902060339 890130
PDR ADOCK 05000327
P PDC

cc:
General Counsel
Tennessee Valley Authority
400 West Summit Hill Drive
E11 B33
Knoxville, Tennessee 37902

Mr. R. L. Gridley
Tennessee Valley Authority
5N 157B Lookout Place
Chattanooga, Tennessee 37402-2801

Mr. John T. LaPoint
Tennessee Valley Authority
Sequoyah Nuclear Plant
P.O. Box 2000
Soddy Daisy, Tennessee 37379

Mr. M. Ray
Tennessee Valley Authority
Sequoyah Nuclear Plant
P.O. Box 2000
Soddy Daisy, Tennessee 37379

Mr. D. L. Williams
Tennessee Valley Authority
400 West Summit Hill Drive
W10 B85
Knoxville, Tennessee 37902

County Judge
Hamilton County Courthouse
Chattanooga, Tennessee 37402

Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
101 Marietta Street, N.W.
Atlanta, Georgia 30323

Resident Inspector/Sequoyah NP
c/o U.S. Nuclear Regulatory Commission
2600 Igou Ferry Road
Soddy Daisy, Tennessee 37379

Mr. Michael H. Mobley, Director
Division of Radiological Health
T.E.R.R.A. Building, 6th Floor
150 9th Avenue North
Nashville, Tennessee 37219-5404

Dr. Henry Myers, Science Advisor
Committee on Interior
and Insular Affairs
U.S. House of Representatives
Washington, D.C. 20515

Tennessee Valley Authority
Rockville Office
11921 Rockville Pike
Suite 402
Rockville, Maryland 20852

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-327

SEQUOYAH NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 98
License No. DPR-77

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Tennessee Valley Authority (the licensee) dated July 27, 1988 as supplemented by letter dated October 20, 1988, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-77 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 98 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Suzanne Black

Suzanne Black, Assistant Director
for Projects
TVA Projects Division
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: January 30, 1989

ATTACHMENT TO LICENSE AMENDMENT NO. 98

FACILITY OPERATING LICENSE NO. DPR-77

DOCKET NO. 50-327

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change.

REMOVE	INSERT
3/4 6-27	3/4 6-27

SURVEILLANCE REQUIREMENTS (Continued)

one basket each from Radial Rows 1, 2, 4, 6, 8 and 9 (or from the same row of an adjacent bay if a basket from a designated row cannot be obtained for weighing) within each bay. If any basket is found to contain less than 1200 pounds of ice, a representative sample of 20 additional baskets from the same bay shall be weighed. The minimum average weight of ice from the 20 additional baskets and the discrepant basket shall not be less than 1200 pounds/basket at a 95% level of confidence.

The ice condenser shall also be subdivided into 3 groups of baskets, as follows: Group 1 - bays 1 through 8, Group 2 - bays 9 through 16, and Group 3 - bays 17 through 24. The minimum average ice weight of the sample baskets from Radial Rows 1, 2, 4, 6, 8 and 9 in each group shall not be less than 1200 pounds/basket at a 95% level of confidence.

The minimum total ice condenser ice weight at a 95% level of confidence shall be calculated using all ice basket weights determined during this weighing program and shall not be less than 2,333,100 pounds.

3. Verifying, by visual inspection of a representative random sample of at least 54 flow passages (33 percent) per ice condenser bay, that the accumulation of frost or ice on flow passages between ice baskets, past lattice frames, through the intermediate and top deck floor grating, or past the lower inlet plenum support structures and turning vanes is less than or equal to 15-percent blockage of the total flow area in each bay, with a 95-percent level of confidence.

   If the summation of blockage from the sample fails to meet the acceptance criteria, then 100 percent of the passages of that bay shall be inspected. If the 100-percent inspection fails to meet the acceptance criteria, then the flow passages shall be cleaned to meet the acceptance criteria. Each flow passage that is cleaned will be reinspected. Any inaccessible flow passage that is not inspected will be considered blocked.

c. At least once per 40 months by lifting and visually inspecting the accessible portions of at least two ice baskets from each 1/3 of the ice condenser and verifying that the ice baskets are free of detrimental structural wear, cracks, corrosion or other damage. The ice baskets shall be raised at least 10 feet for this inspection.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-328

SEQUOYAH NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 87
License No. DPR-79

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Tennessee Valley Authority (the licensee) dated July 27, 1988 as supplemented by letter dated October 20, 1988, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-79 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 87, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Suzanne Black

Suzanne Black, Assistant Director
for Projects
TVA Projects Division
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: January 30, 1989

ATTACHMENT TO LICENSE AMENDMENT NO. 87

FACILITY OPERATING LICENSE NO. DPR-79

DOCKET NO. 50-328

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change.

REMOVE	INSERT
3/4 6-28	3/4 6-28

SURVEILLANCE REQUIREMENTS (Continued)

2. Weighing a representative sample of at least 144 ice baskets and verifying that each basket contains at least 1200 lbs of ice. The representative sample shall include 6 baskets from each of the 24 ice condenser bays and shall be constituted of one basket each from Radial Rows 1, 2, 4, 6, 8 and 9 (or from the same row of an adjacent bay if a basket from a designated row cannot be obtained for weighing) within each bay. If any basket is found to contain less than 1200 pounds of ice, a representative sample of 20 additional baskets from the same bay shall be weighed. The minimum average weight of ice from the 20 additional baskets and the discrepant basket shall not be less than 1200 pounds/basket at a 95% level of confidence.

   The ice condenser shall also subdivided into 3 groups of baskets, as follows: Group 1 - bays 1 through 8, Group 2 - bays 9 through 16, and Group 3 - bays 17 through 24. The minimum average ice weight of the sample baskets from Radial Rows 1, 2, 4, 6, 8 and 9 in each group shall not be less than 1200 pounds/basket at a 95% level of confidence.

   The minimum total ice condenser ice weight at a 95% level of confidence shall be calculated using all ice basket weights determined during this weighing program and shall not be less than 2,333,100 pounds.

3. Verifying, by visual inspection of a representative random sample of at least 54 flow passages (33 percent) per ice condenser bay, that the accumulation of frost or ice on flow passages between ice baskets, past lattice frames, through the intermediate and top deck floor grating or past the lower inlet plenum support structures and turning vanes is less than or equal to 15-percent blockage of the total flow area in each bay, with a 95-percent level of confidence.

   If the summation of blockage from the sample fails to meet the acceptance criteria, then 100 percent of the passages of that bay shall be inspected. If the 100-percent inspection fails to meet the acceptance criteria, then the flow passages shall be cleaned to meet the acceptance criteria. Each flow passage that is cleaned will be reinspected. Any inaccessible flow passage that is not inspected will be considered blocked.

c. At least once per 40 months by lifting and visually inspecting the accessible portions of at least two ice baskets from each 1/3 of the ice condenser and verifying that the ice baskets are free of detrimental structural wear, cracks, corrosion or other damage. The ice baskets shall be raised at least 10 feet for this inspection.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF SPECIAL PROJECTS

SUPPORTING AMENDMENT NO. 98 TO FACILITY OPERATING LICENSE NO. DPR-77

AND AMENDMENT NO. 87 TO FACILITY OPERATING LICENSE NO. DPR-79

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-327 AND 50-328

1.0 INTRODUCTION

By letter dated July 27, 1988, the Tennessee Valley Authority (the licensee) proposed to modify the Sequoyah Nuclear Plant (SQN) Units 1 and 2 Technical Specifications (TS) to revise the containment systems surveillance requirement (SR) 4.6.5.1.b.3 for both units. This change will replace the current visual inspection requirement utilizing a 0.38-inch criterion for the ice condenser system with a surveillance program to ensure that the flow blockage does not exceed 15 percent. Supplemental information was provided in the licensee's letter dated October 20, 1988. This is the licensee's TS change request 88-13.

The supplemental information in the licensee's letter dated October 20, 1988 clarified the revised surveillance requirements for the ice condenser system which were provided in its application for the proposed amendments to the TS. It did not change the substance of the proposed action in the Federal Register Notice (53 FR 32293) published on August 24, 1988 for the proposed amendments and did not affect the staff's initial determination of no significant hazards consideration in that notice.

2.0 EVALUATION

Frost or ice accumulation in flow passages between ice baskets may momentarily restrict the flow of steam through the ice condenser in the event of a hypothetical loss of coolant accident (LOCA). The licensee stated that this restriction will only be momentary, because the high energy steam will quickly melt any accumulation. Hence, the only design basis accident that may be affected by such accumulation is the Short-Term Pressure Analysis (or Subcompartment Pressurization Analysis) presented in Section 6.2.1.3.3 of the SQN Final Safety Analysis Report (FSAR).

The current SR visual inspection of 0.38 inch frost buildup along the 48 feet of vertical flow path is extremely difficult to accomplish and does not adequately reflect the intent of TS. The current SR would allow more than 15 percent flow blockage of the total ice condenser bay flow path. The proposed SR will allow no more than 15 percent blockage of the total flow area to limit the peak containment pressure below the design pressure of 12 psi gauge.

The proposed SR will be accomplished by visually inspecting a representative random sample of at least 54 flow passages (33 percent) per ice condenser bay and assuring that the accumulation of frost or ice on flow passages between ice baskets, past lattice frames, through the intermediate and top deck floor grating, or past the lower inlet plenum support structures and turning vanes is less than or equal to 15-percent blockage of the total flow area in each bay, with a 95-percent level of confidence. If the summation of blockage from the sample fails to meet the acceptance criteria, then 100 percent of the passages of that bay shall be inspected.

An analysis of containment pressure during a LOCA was performed to ensure that the subcompartment wall and the steel shell of the containment structure can maintain their structural integrity during the short-pressure pulse (generally less than 3 seconds) that accompanies the rupture of a high-energy line within the lower compartment.

A flow restriction in the ice condenser flow paths could result in a momentary pressure buildup in the lower compartment or lower plenum of the ice condenser bays and challenge the integrity of the operating deck, the upper or lower crane wall, or the containment steel shell. The analysis utilized an NRC-approved Transient Mass Distribution (TMD) code employing the same assumption used in the base analysis documented in Section 6.2.1.3.3 of the FSAR with the exception that the 15-percent uniform flow area blockage assumption was employed. The analytical solution of the TMD is developed by considering the conservation equations of mass, momentum and energy and the equation of state, together with the control volume technique for simulating spatial variation. The 15-percent flow blockage assumption corresponds to a 6.15-square-foot blockage area of a possible 41.02-square-foot flow area in each condenser bay. The 41.02-square-foot value is the assumed flow area through the ice condenser bay at an elevation with a lattice frame. This flow area is assumed to occur over the entire 48-foot flow passage length throughout the ice condenser bays. This reduced flow area was assumed to be permanent throughout the duration of the accident, conservatively neglecting the fact that much of the blockage would be blown out by the high-energy flow through the ice condenser passages.

The calculations confirmed that the operating deck floor slab, refueling canal wall, crane wall above the ice condenser columns, and ice condenser end walls were structurally adequate to withstand a design basis accident pressure increase because of ice condenser blockage up to 15 percent. These calculations confirmed that each area is structurally adequate for operating at the increased pressures.

Based on the above, the staff finds that the proposed change for both units in the surveillance requirements for the ice condenser flow channels in TS change request 88-13 is acceptable.

3.0 ENVIRONMENTAL CONSIDERATION

These amendments involve a change to a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes to the surveillance requirements. The staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that these amendments involve no significant hazards consideration and there has been no public comment on such finding. Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement nor environmental assessment need be prepared in connection with the issuance of these amendments.

4.0 CONCLUSION

The Commission made a proposed determination that the amendment involves no significant hazards consideration which was published in the Federal Register (53 FR 32293) on August 24, 1988, and consulted with the State of Tennessee. No public comments were received and the State of Tennessee did not have any comments.

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendments will not be inimical to the common defense and security nor to the health and safety of the public.

Principal Contributor: S. B. Kim

Dated: January 30, 1989