Docket No. 50-327 September 19, 1989

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

Dear Mr. Kingsley:

SUBJECT: WEIGHING OF ICE CONDENSER ICE BASKETS (TAC 73429) (TS 89-24)
SEQUOYAH NUCLEAR PLANT, UNIT 1

The Commission has issued the enclosed Amendment No. 126 to Facility Operating License No. DPR-77 for the Sequoyah Nuclear Plant, Unit 1. This amendment is in response to your application dated June 20, 1989, as supplemented by your letter dated August 10, 1989.

This amendment modifies the Sequoyah Nuclear Plant, Unit 1, Technical Specifications. The change revises Surveillance Requirements (SR) 4.6.5.1.b.2 to allow Unit 1 a one-time extension to the next refueling outage for weighing ice baskets in the containment ice condenser. A footnote is added to the current requirement that the SR be performed at least once every 12 months. The footnote states that the SR will be performed in the Unit 1 Cycle 4 refueling outage, which shall begin no later than April 1, 1990. The amendment requires that ice weighing must be completed before Unit 1 may restart from the Unit 1 Cycle 4 refueling outage.

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

1. Amendment No. 126 to License No. DPR-77
2. Safety Evaluation

cc w/enclosures:
See next page

Distribution
NRC PDR
Local PDR
EJordan
ADSP Reading
DCrutchfield
BDLiaw
SBlack
RPierson

JDonohew(2)
OGC
LWatson

Docket File
JBrady
JZwolinski
SQN Rdg. File
DHagan
TMeek(4)
WJones
EButcher
ACRS(10)
GPA/CA
GPA/PA
ARM/LFMB
BWilson

SKim
DTerao
KJenison
T. Quay

OFO1
1/1

OFC	:NRR:TVA/LA	:NRR:TVA/PM	:NRR:TVA/EB	NRR:TVA/BC	TVA:AD/TP	OGC	:TVA:AD/P
NAME	:MSimms	:JDonohew:as	:SBKim	:DTerao for	RPierson	BMB	SBlack
DATE	:9/19/89	:8/23/89	:8/30/89	:9/1/89	:9/1/89	:9/8/89	9/19/89

OFFICIAL RECORD COPY

cc:
General Counsel
Tennessee Valley Authority
400 West Summit Hill Drive
ET 11B 33H
Knoxville, Tennessee 37902

Mr. F. L. Moreadith
Vice President, Nuclear Engineering
Tennessee Valley Authority
400 West Summit Hill Drive
WT 12A 12A
Knoxville, Tennessee 37902

Dr. Mark O. Medford
Vice President and Nuclear
Technical Director
Tennessee Valley Authority
6N 38A Lookout Place
Chattanooga, Tennessee 37402-2801

Manager, Nuclear Licensing
and Regulatory Affairs
Tennessee Valley Authority
5N 157B Lookout Place
Chattanooga, Tennessee 37402-2801

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

Mr. M. Burzynski
Site Licensing Manager
Sequoyah Nuclear Plant
P. O. Box 2000
Soddy Daisy, Tennessee 37379

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

Mr. Kenneth M. Jenison
Senior Resident Inspector
Sequoyah Nuclear Plant
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. 126
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 June 20, 1989 as supplemented by letter dated August 10, 1989, 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. 126 , 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: September 19, 1989

ATTACHMENT TO LICENSE AMENDMENT NO. 126

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 6-26	3/4 6-26

CONTAINMENT SYSTEMS

3/4.6.5 ICE CONDENSER

ICE BED

LIMITING CONDITION FOR OPERATION

3.6.5.1. The ice bed shall be OPERABLE with:

a. The stored ice having a boron concentration of at least 1800 ppm boron as sodium tetraborate and a pH of 9.0 to 9.5,

b. Flow channels through the ice condenser,

c. A maximum ice bed temperature of less than or equal 27°F,

d. A total ice weight of at least 2,333,100 pounds at a 95% level of confidence, and

e. 1944 ice baskets.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With the ice bed inoperable, restore the ice bed to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.5.1 The ice condenser shall be determined OPERABLE:

a. At least once per 12 hours by using the ice bed temperature monitoring system to verify that the maximum ice bed temperature is less than or equal to 27°F.

b. At least once per 6 months during the first 2 years following initial criticality and at least once per 12 months thereafter by:

1. Chemical analyses which verify that at least 9 representative samples of stored ice have a boron concentration of at least 1800 ppm as sodium tetraborate and a pH of 9.0 to 9.5 at 20°C.

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

*A one-time extension is permitted until the Unit 1 Cycle 4 refueling outage which shall begin no later than April 1, 1990.

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

ENCLOSURE 2

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 126 TO FACILITY OPERATING LICENSE NO. DPR-77

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT, UNIT 1

DOCKET NO. 50-327

1.0 INTRODUCTION

By letter dated June 20, 1989, the Tennessee Valley Authority (TVA or the licensee), the licensee for Sequoyah (SQN), proposed a change to the Technical Specifications (TS) of the Operating License for Unit 1. The proposed change would revise surveillance requirement (SR) 4.6.5.1.b.2 to allow a one-time extension for weighing ice baskets to the next refueling outage, the Cycle 4 refueling outage. A footnote would be added to the current requirement that the SR be performed at least once every 12 months. The footnote would state that the SR will be performed in the Unit 1 Cycle 4 refueling outage, which shall begin not later than April 1, 1990. This is the licensee's TS change request number 89-24.

In its supplemental letter dated August 10, 1989, the licensee provided a clarification of its application dated June 20, 1989. The licensee submitted Revision 3 of its ice weight calculation which was submitted to support the proposed TS change. Revision 2 of the calculation was submitted with the licensee's application dated June 20, 1989. Revision 3 addresses design input and computation errors in Revision 2. The predicted ice-weights for the three lowest ice-weight regions predicted by Revision 2 were calculated to be of slightly greater ice-weight in Revision 3. These regions remain the lowest ice-weight regions in Revision 3. This supplemental information did not change the substance of the proposed action described in the Federal Register (54 FR 29414) published on July 12, 1989 and did not affect the staff's initial determination of no significant hazards consideration in that notice.

2.0 EVALUATION

The operability of the ice beds in the ice condenser requires that the ice inventory be distributed evenly throughout the ice condenser bays in containment and contain sufficient heat removal capability to condense the reactor system volume released during a loss-of-coolant accident (LOCA). Sufficient pressure suppression capability from the ice in the ice condenser is necessary to limit the containment peak pressure transient during a LOCA. The ice inventory is contained in 1,944 ice baskets throughout the ice condenser.

In a letter from M. J. Ray (TVA) to NRC dated June 20, 1989, the licensee requested an extension to SR 4.6.5.1.b.2 to postpone weighing of ice until the Unit 1 Cycle 4 refueling outage, which shall begin not later than April 1, 1990. The last ice-weight surveillance performed for SQN Unit 1 was completed September 16, 1988. SR 4.6.5.1.b.2 requires that the next ice-weighing surveillance be performed within 12 months of that date (i.e., by September 15, 1989). Applying the provisions of TS 4.0.2 would allow an extension of the surveillance interval by a three months (i.e., December 15, 1989). The licensee is requesting an additional three and one-half month extension to allow the ice-weighing outage to be conducted coincident with the Unit 1 Cycle 4 refueling outage. The licensee stated that this extension would provide increased plant availability and would allow for more efficient use of manpower.

The licensee provided a justification for the proposed TS change in its application dated June 20, 1989 and in its supplemental letter dated August 10, 1989. The supplemental letter provided Revision 3 of the licensee's ice weight calculations which addressed minor input and computational errors in Revision 2. This justification is based on data from the previous ice weighing surveillance by the licensee covering the period between September 1981 to April 1985. Based on the average sublimation rate and extrapolation of the data to April 1, 1990, the licensee estimated that the overall weight of the ice condenser would be greater than the minimum required amount of 2,333,100 pounds of ice, listed in the TS 3.6.5.1.d and 4.6.5.1.b. This amount of ice satisfies the basic safety function of the ice condenser which is to provide sufficient heat removal capability for the containment during the design basis LOCA. The licensee predicted, through its calculations, a total weight of 2,458,188 pounds of ice in the ice condenser for April 1, 1990. The calculations used the average rate of sublimation for the period from September 1981 to April 1985. Because the sublimination rate has decreased since the initial ice weighing, these calculations should be conservative.

The licensee performed several other calculations to demonstrate uniform distribution of the ice in the condenser so that it is consistent with the assumption in the containment pressure calculation. The licensee concluded that, using the expected sublimation rate, all of the group-row combinations and bays are well in excess of the analytical limit of 1,080 pounds for an ice basket, which is the amount taken credit for in all containment safety analyses. The bases for the TS state that the weight of 1,200 pounds of ice per ice basket contains a 10% allowance for ice loss through sublimination. A theoretical weight of 1,080 pounds is only used in the analysis and the licensee did not request a change of the SR other than a one time extension of surveillance indicating that the licensee will continue to use the 1,200 pounds SR requirement for the April 1990 outage.

The proposed change requires that the weighing of the ice baskets must be completed before Unit 1 may restart from the Unit 1 Cycle 4 refueling outage, when the ice condensers will again be required for power operation.

Based on the above discussion, the staff finds that the proposed one time extension of the ice basket weighing requirement to the Unit 1 Cycle 4 refueling outage which begins not later than April 1, 1990 is acceptable and concludes that the ice condenser has sufficient capability to perform its safety function during the requested extension period. The total weight of ice in the ice condenser is not expected to drop below the TS limit through sublimination before the unit shutdown for its Cycle 4 refueling outage.

3.0 ENVIRONMENTAL CONSIDERATION

This amendment involves 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 amendment involves 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 this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, the amendment meets 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 this amendment.

4.0 CONCLUSION

The Commission made a proposed determination that the amendment involves no significant hazards consideration which was published in the Federal Register (54 FR 29414) on July 12, 1989 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 amendment 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: September 19, 1989