

February 11, 1988

Docket Nos. 50-327/328

Mr. S. A. White
Manager of Nuclear Power
Tennessee Valley Authority
6N 38A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dear Mr. White:

SUBJECT: LOWER CONTAINMENT VENT COOLERS (TAC 00209, 00210) (TS 87-37)

Re: Sequoyah Nuclear Plant, Units 1 and 2

The Commission has issued the enclosed Amendment No. 67 to Facility Operating License No. DPR-77 and Amendment No. 59 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 September 16, 1987 requesting the addition of requirements for lower containment vent coolers. These requirements assist in assurance that post-accident long-term containment temperatures remain below the current environmental qualification curve.

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:
Gerald E. Gears for

Gary G. Zech, Assistant Director
for Projects
TVA Projects Division
Office of Special Projects

Enclosures:

- 1. Amendment No. 67 to License No. DPR-77
- 2. Amendment No. 59 to License No. DPR-79
- 3. Safety Evaluation

cc w/enclosures:
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February 11, 1988

MEMORANDUM FOR: Sholly Coordinator
FROM: Gary G. Zech, Assistant Director
for Projects, OSP
SUBJECT: REQUEST FOR PUBLICATION IN BI-WEEKLY FR NOTICE - NOTICE
OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE
(TAC 00209/00210)

Tennessee Valley Authority, Docket Nos. 50-327 and 50-328, Sequoyah Nuclear
Plant, Units 1 and 2, Hamilton County, Tennessee

Date of application for amendments: September 16, 1987 (TS 87-37)

Brief description of amendments: The amendments add requirements for the
long-term containment cooling system lower compartment containment coolers
to the Sequoyah Units 1 and 2 Technical Specifications.

Date of issuance: February 11, 1988

Effective date: February 11, 1988

Amendment Nos.: 67, 59

Facility Operating Licenses Nos. DPR-77 and DPR-79. Amendments revised the
Technical Specifications.

Date of initial notice in FEDERAL REGISTER: December 16, 1987 (52 FR 47795).

The Commission's related evaluation of the amendment is contained in a Safety
Evaluation dated February 11, 1988.

No significant hazards consideration comments received: No

Local Public Document Room location: Chattanooga-Hamilton County Library,
1001 Broad Street, Chattanooga, Tennessee 37402.

Original signed by:
Gerald E. Bears
Gary G. Zech, Assistant Director
for Projects, OSP

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TVA:GGZ
GGZech
2/11/88



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

February 11, 1988

Docket Nos. 50-327/328

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Manager of Nuclear Power
Tennessee Valley Authority
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Re: Sequoyah Nuclear Plant, Units 1 and 2

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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,

A handwritten signature in cursive script, appearing to read "Gary G. Zech".

Gary G. Zech, Assistant Director
for Projects
TVA Projects Division
Office of Special Projects

Enclosures:

1. Amendment No. 67 to License No. DPR-77
2. Amendment No. 59 to License No. DPR-79
3. Safety Evaluation

cc w/enclosures:
See next page

~~8802220072~~ 4p.

Mr. S. A. White
Tennessee Valley Authority

Sequoyah Nuclear Plant

cc:
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Regional Administrator, Region II
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County Judge
Hamilton County Courthouse
Chattanooga, Tennessee 37402

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



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. 67
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 September 16, 1987, 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.

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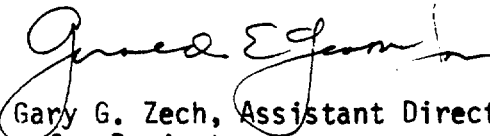
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-77 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 67, 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


Gary G. Zech, Assistant Director
for Projects
TVA Projects Division
Office of Special Projects

Attachment:
Changes to the Technical
Specifications

Date of Issuance: February 11, 1988

ATTACHMENT TO LICENSE AMENDMENT NO. 67

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. Overleaf pages* are provided to maintain document completeness.

REMOVE

VII

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CONTAINMENT SYSTEMS

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

LOWER CONTAINMENT VENT COOLERS

LIMITING CONDITION FOR OPERATION

3.6.2.2 Two independent trains of lower containment vent coolers shall be OPERABLE with two coolers to each train.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

- a. With one of the above required lower containment vent coolers inoperable, restore to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With two lower containment vent coolers of the same train inoperable, restore to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.2 Each lower containment vent cooler shall be demonstrated OPERABLE:

- a. At least once per 31 days by verifying that each fan operates for at least 15 minutes.
- b. At least once per 18 months by:
 1. Verifying from the control room that each fan starts.
 2. Verifying a cooling water flow rate of greater than or equal to 200 gpm to each cooler.

CONTAINMENT SYSTEMS

BASES

3/4.6.1.8 EMERGENCY GAS TREATMENT SYSTEM (EGTS)

The OPERABILITY of the EGTS cleanup subsystem ensures that during LOCA conditions, containment vessel leakage into the annulus will be filtered through the HEPA filters and charcoal adsorber trains prior to discharge to the atmosphere. This requirement is necessary to meet the assumptions used in the accident analyses and limit the site boundary radiation doses to within the limits of 10 CFR 100 during LOCA conditions. Cumulative operation of the system with the heaters on for 10 hours over a 31 day period is sufficient to reduce the buildup of moisture on the absorbers and HEPA filters. ANSI N510-1975 will be used as a procedural guide for surveillance testing.

3/4.6.1.9 CONTAINMENT VENTILATION SYSTEM

Use of the containment purge lines is restricted to only one pair (one supply line and one exhaust line) of purge system lines at a time to ensure that the site boundary dose guidelines of 10 CFR Part 100 would not be exceeded in the event of a loss of coolant accident during purging operations. The analysis of this accident assumed purging through the largest pair of lines (a 24 inch inlet line and a 24 inch outlet line), a pre-existing iodine spike in the reactor coolant and four second valve closure times.

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

3/4.6.2.1 CONTAINMENT SPRAY SYSTEM

The OPERABILITY of the containment spray system ensures that containment depressurization and cooling capability will be available in the event of a LOCA. The pressure reduction and resultant lower containment leakage rate are consistent with the assumptions used in the accident analyses.

3/4.6.2.2 CONTAINMENT COOLING FANS

The OPERABILITY of the lower containment vent coolers ensures that adequate heat removal capacity is available to provide long-term cooling following a non-LOCA event. Postaccident use of these coolers ensures containment temperatures remain within environmental qualification limits for all safety-related equipment required to remain functional.

3/4.6.3 CONTAINMENT ISOLATION VALVES

The OPERABILITY of the containment isolation valves ensures that the containment atmosphere will be isolated from the outside environment in the event of a release of radioactive material to the containment atmosphere or pressurization of the containment. Containment isolation within the time limits specified ensures that the release of radioactive material to the environment will be consistent with the assumptions used in the analyses for a LOCA. By letters dated March 3, 1981, and April 2, 1981, TVA will submit a report on the operating experience of the plant no later than startup after the first refueling. This information will be used to provide a basis to re-evaluate the adequacy of the purge and vent time limits.

CONTAINMENT SYSTEMS

BASES

3/4.6.4 COMBUSTIBLE GAS CONTROL

The OPERABILITY of the equipment and system required for the detection and control of hydrogen gas ensures that this equipment will be available to maintain the hydrogen concentration within containment below its flammable limit during post-LOCA conditions. Either recombiner unit or the purge system



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. 59
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 September 16, 1987, 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.

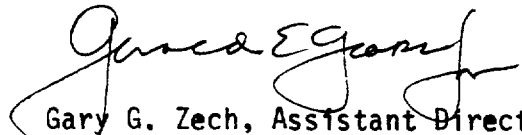
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-79 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 59, 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


Gary G. Zech, Assistant Director
for Projects
TVA Projects Division
Office of Special Projects

Attachment:
Changes to the Technical
Specifications

Date of Issuance: February 11, 1988

ATTACHMENT TO LICENSE AMENDMENT NO. 59

FACILITY OPERATING LICENSE NO. DPR-79

DOCKET NO. 50-328

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CONTAINMENT SYSTEMS

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

LOWER CONTAINMENT VENT COOLERS

LIMITING CONDITION FOR OPERATION

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4.6.2.2 Each lower containment vent cooler shall be demonstrated OPERABLE:

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3/4.6.2.1 CONTAINMENT SPRAY SYSTEM

The OPERABILITY of the containment spray system ensures that containment depressurization and cooling capability will be available in the event of a LOCA. The pressure reduction and resultant lower containment leakage rate are consistent with the assumptions used in the accident analyses.

3/4.6.2.2 CONTAINMENT COOLING FANS

The OPERABILITY of the lower containment vent coolers ensures that adequate heat removal capacity is available to provide long-term cooling following a non-LOCA event. Postaccident use of these coolers ensures containment temperatures remain within environmental qualification limits for all safety-related equipment required to remain functional.

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CONTAINMENT SYSTEMS

BASES

3/4.6.4 COMBUSTIBLE GAS CONTROL

The OPERABILITY of the equipment and systems required for the detection and control of hydrogen gas ensures that this equipment will be available to maintain the hydrogen concentration within containment below its flammable limit during post-LOCA conditions. Either recombiner unit or the hydrogen mitigation system, consisting of 68 hydrogen igniters per unit, is capable of controlling the expected hydrogen generation associated with 1) zirconium-water reactions, 2) radiolytic decomposition of water and 3) corrosion of metals within containment. These hydrogen control systems are designed to mitigate the effects of an accident as described in Regulatory Guide 1.7, "Control of Combustible Gas Concentrations in Containment Following a LOCA," Revision 2, dated November 1978.

The hydrogen mixing systems are provided to ensure adequate mixing of the containment atmosphere following a LOCA. This mixing action will prevent localized accumulations of hydrogen from exceeding the flammable limit.

The operability of at least 66 of 68 igniters in the hydrogen control distributed ignition system will maintain an effective coverage throughout the containment. This system of igniters will initiate combustion of any significant amount of hydrogen released after a degraded core accident. This system is to ensure burning in a controlled manner as the hydrogen is released instead of allowing it to be ignited at high concentrations by a random ignition source.

3/4.6.5 ICE CONDENSER

The requirements associated with each of the components of the ice condenser ensure that the overall system will be available to provide sufficient pressure suppression capability to limit the containment peak pressure transient to less than 12 psig during LOCA conditions.

3/4.6.5.1 ICE BED

The OPERABILITY of the ice bed ensures that the required ice inventory will 1) be distributed evenly through the containment bays, 2) contain sufficient boron to preclude dilution of the containment sump following the LOCA and 3) contain sufficient heat removal capability to condense the reactor system volume released during a LOCA. These conditions are consistent with the assumptions used in the accident analyses.

The minimum weight figure of 1200 pounds of ice per basket contains a 10% conservative allowance for ice loss through sublimation which is a factor of 10 higher than assumed for the ice condenser design. The minimum weight figure of 2,333,100 pounds of ice also contains an additional 1% conservative allowance to account for systematic error in weighing instruments. In the event that observed sublimation rates are equal to or lower than design predictions after three years of operation, the minimum ice baskets weight may be adjusted downward. In addition, the number of ice baskets required to be weighed each 9 months may be reduced after 3 years of operation if such a reduction is supported by observed sublimation data.



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

SAFETY EVALUATION BY THE OFFICE OF SPECIAL PROJECTS

SUPPORTING AMENDMENT NO. 67 TO FACILITY OPERATING LICENSE NO. DPR-77

AND AMENDMENT NO. 59 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 September 16, 1987 the Tennessee Valley Authority (TVA) proposes to amend the Sequoyah Nuclear Plant, Units 1 and 2 Technical Specifications (TS) to add requirements for containment cooling for non-loss of coolant accident (LOCA) events. Specifically, the proposed new TS would impose Limiting Conditions for Operation (LCO) and associated Surveillance Requirements (SR) for the lower containment cooling fans to ensure that long-term containment temperatures following a Main Steam Line Break (MSLB) remain below the environmental qualifications (EQ) limits.

2.0 EVALUATION

The current EQ temperature inside the Sequoyah containments is based on the reactor coolant system (RCS) achieving a cold shutdown condition. The Sequoyah plant cooldown is accomplished post-accident by the recirculation mode of core cooling or use of the residual heat removal (RHR) system once RCS temperature and pressure are below entry conditions. However, TVA notes in its September 16, 1987 submittal, an MSLB inside containment creates flooding conditions at the single RHR sump suction line thereby possibly preventing the use of the RHR for achieving cold shutdown. The RHR suction line from the containment sump has isolation valves in series; therefore, a failure of either isolation valve to open would cause a total loss of RHR recirculation cooling. If this condition occurs, the RCS would have to be maintained in the hot standby mode. This is the present licensing bases for the Sequoyah plants.

The post-accident effects of an MSLB on containment temperature at Sequoyah were evaluated by TVA. Sections 6.2.1 and 15.4.2 of the Final Safety Analysis Report (FSAR) discuss the MSLB for Sequoyah. The analysis includes the upper, lower, ice condenser, and dead-ended regions of the containment. The containment coolers were used for the current FSAR analysis for achieving steady state containment temperature. The results show that, with the use of the containment coolers, the current environmental temperature qualification curve remains bounding for all areas of the lower containment. Since the containment coolers are required to maintain the lower containment compartment temperature below the environmental temperature curve, they have an assumed role in accident mitigation and, therefore, TS for this equipment is required.

TVA has proposed new TS requirements for the containment cooling system which were derived from the Standard Technical Specifications (STS) (NUREG-0452, Revision 4). Specifically, the proposed TS provide LCO, the appropriate Mode, Applicability, Action statements for system inoperability, and SR. Since no credit was taken for containment spray once the coolers are placed in operation, the proposed TS have been modified from the STS to delete references to the containment spray systems. Also, the SR for manual fan actuation was modified to reduce the testing interval to 18 months rather than every 31 days. This deviation from the STS is acceptable to the staff since these fans are used continuously during normal operation, thus providing continuous fan performance data, and any change to this normal operating procedure would require TVA to perform a 10 CFR 50.59 evaluation which must include consideration of any reduction in the margin of safety from non-use of the system or its components. The proposed testing requirements would also be consistent with manual actuation test intervals for Engineered Safety Feature Actuation System instrumentation and Emergency Core Cooling System equipment.

The proposed testing interval to verify cooling water flow rate is at least once every 18 months. This interval is a reduction in frequency from the STS SR interval of once every 31 days. As TVA states in its September 16, 1987 submittal, the purpose of this SR is to demonstrate that a 200 gpm minimum cooling water flow rate is delivered to the containment coolers. Current TS SR 4.7.4.9 for essential raw cooling water (ERCW) system operability requires verification of proper valve alignment to safety-related equipment every 31 days. This verification includes the valves which provide flow to the containment coolers. The flow path for containment cooler cooling water, therefore, is verified every 31 days. Therefore, these SR, when compared to the equivalent portion of the STS for Containment Cooling Systems are being provided for by Sequoyah ERCW TS SR 4.7.4.9, and need not be required in TS SR 4.6.2.2. TVA has committed to revise the appropriate plant Surveillance Instructions to include the necessary lower containment cooler valve alignment and throttle position verification.

The FSAR Chapter 15 analysis shows that the containment coolers would not be required until after ice bed meltout occurs. Ice bed meltout is estimated at 10 hours after event initiation. The SR for automatic actuation testing, therefore, has been proposed to be deleted. Instead, TVA has proposed credit be taken for manual operator action to start the containment coolers, by procedure, between 1 and 4 hours after event initiation. The cooling fans should not be actuated prior to 1 hour after event initiation because of concern for exceeding the fan motor capacity. The 4 hour time limit for fan starting ensures that the coolers will be operating well before a conservative determination of ice bed meltout. Based on these long time periods, and the NRC staff practice for minimum time allowed for operator action of 20 minutes, NRC staff has determined that manual actuation of the containment cooling fans is acceptable and therefore deviation from the STS by deletion of the automatic start SR is appropriate.

NRC staff has evaluated the remaining differences between the STS and the TVA proposed TS and has found them to be administrative in nature. These differences have been proposed so as to accommodate Sequoyah specific differences from the STS such as the use of "trains" as opposed to "groups." Also proposed are the titular, specification, and page number sequence differences. NRC staff concludes these differences from the STS are appropriate for the Sequoyah facilities and are, therefore, found to be acceptable.

TVA has also proposed the addition of TS Bases for the preceding changes. The NRC staff finds the inclusion of these bases to be appropriate.

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 the amendments.

4.0 CONCLUSION

We have 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.

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Dated: February 11, 1988