

June 14, 1995

Mr. Oliver D. Kingsley, Jr.  
President, TVA Nuclear and  
Chief Nuclear Officer  
Tennessee Valley Authority  
6A Lookout Place  
1101 Market Street  
Chattanooga, TN 37402-2801

SUBJECT: ISSUANCE OF AMENDMENTS FOR THE SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2  
(TAC NOS. M91986 AND M91987) (TS 95-06)

Dear Mr. Kingsley:

The Commission has issued the enclosed Amendment No. 204 to Facility Operating License No. DPR-77 and Amendment No. 194 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 April 6, 1995.

The amendments remove the technical specification requirements related to crane travel over the spent fuel pool. As explained in the attached safety evaluation, the staff suggests that the crane operation procedures clearly identify the loads over the spent fuel pool that have been specifically analyzed under the existing licensing basis to permit the crane interlocks and physical stops to be defeated. Different operation or loading conditions in the future will have to be evaluated to determine whether such differences involve an increase in the probability or consequences of a load drop accident or a reduction in the margin of safety in accordance with 10 CFR 50.59.

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

Sincerely,

ORIGINAL SIGNED BY:

David E. LaBarge, Sr. Project Manager  
Project Directorate II-3  
Division of Reactor Projects - I/I  
Office of Nuclear Reactor Regulation

Docket Nos. 50-327 and 50-328

- Enclosures: 1. Amendment No. 204 to License No. DPR-77  
2. Amendment No. 194 to License No. DPR-79  
190065 3. Safety Evaluation

cc w/enclosures: See next page

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AMENDMENT NO. 204 FOR SEQUOYAH UNIT NO. 1 - DOCKET NO. 50-327 and  
AMENDMENT NO. 194 FOR SEQUOYAH UNIT NO. 2 - DOCKET NO. 50-328  
DATED: June 14, 1995

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-327

SEQUOYAH NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 204  
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 April 6, 1995, 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. 204, 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, to be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

  
Frederick J. Hebbon, Director  
Project Directorate II-3  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: June 14, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 204

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.

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3/4.9.7 CRANE TRAVEL - SPENT FUEL PIT AREA

LIMITING CONDITION FOR OPERATION

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3.9.7 This specification is deleted.

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## REFUELING OPERATIONS

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#### 3/4.9.6 MANIPULATOR CRANE

The OPERABILITY requirements for the manipulator cranes ensure that: 1) manipulator cranes will be used for movement of drive rods and fuel assemblies, 2) each crane has sufficient load capacity to lift a drive rod or fuel assembly, and 3) the core internals and pressure vessel are protected from excessive lifting force in the event they are inadvertently engaged during lifting operations.

#### 3/4.9.7 CRANE TRAVEL - SPENT FUEL PIT AREA

This specification is deleted.

#### 3/4.9.8 RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION

The requirement that at least one residual heat removal (RHR) loop be in operation ensures that; 1) sufficient cooling capacity is available to remove decay heat and maintain the water in the reactor pressure vessel below 140°F as required during the REFUELING MODE, and 2) sufficient coolant circulation is maintained through the reactor core to minimize the effects of a boron dilution incident and prevent boron stratification. The minimum required flow rate of 2000 gpm ensures decay heat removal, minimizes the probability of losing an RHR pump by air-entrainment from pump vortexing, and minimizes the potential for valve damage due to cavitation or chatter. Losing an RHR pump is a particular concern during reduced RCS inventory operation. The 2000 gpm value is limited by the potential for cavitation in the control valve and chattering in the 10-inch check valve.

The requirement to have two RHR loops OPERABLE when there is less than 23 feet of water above the reactor pressure vessel flange ensures that a single failure of the operating RHR loop will not result in a complete loss of residual heat removal capability. With the reactor vessel head removed and 23 feet of water above the reactor pressure vessel flange, a large heat sink is available for core cooling. Thus, in the event of a failure of the operating RHR loop, adequate time is provided to initiate emergency procedures to cool the core.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-328

SEQUOYAH NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 194  
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 April 6, 1995, 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.

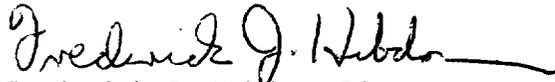
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-79 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 194, 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, to be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Frederick J. Hebdon, Director  
Project Directorate II-3  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: June 14, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 194

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.

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REFUELING OPERATIONS

3/4.9.7 CRANE TRAVEL - SPENT FUEL PIT AREA

LIMITING CONDITION FOR OPERATION

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3.9.7 This specification is deleted.

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## REFUELING OPERATIONS

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#### 3/4.9.6 MANIPULATOR CRANE

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#### 3/4.9.7 CRANE TRAVEL - SPENT FUEL PIT AREA

This specification is deleted.

#### 3/4.9.8 RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION

The requirement that at least one residual heat removal (RHR) loop be in operation ensures that; 1) sufficient cooling capacity is available to remove decay heat and maintain the water in the reactor pressure vessel below 140°F as required during the REFUELING MODE, and 2) sufficient coolant circulation is maintained thru the reactor core to minimize the effects of a boron dilution incident and prevent boron stratification. The minimum required flow rate of 2000 gpm ensures decay heat removal, minimizes the probability of losing an RHR pump by air-entrainment from pump vortexing, and minimizes the potential for valve damage due to cavitation or chatter. Losing an RHR pump is a particular concern during reduced RCS inventory operation. The 2000 gpm value is limited by the potential for cavitation in the control valve and chattering in the 10-inch check valve.

The requirement to have two RHR loops OPERABLE when there is less than 23 feet of water above the reactor pressure vessel flange ensures that a single failure of the operating RHR loop will not result in a complete loss of residual heat removal capability. With the reactor vessel head removed and 23 feet of water above the reactor pressure vessel flange, a large heat sink is available for core cooling. Thus, in the event of a failure of the operating RHR loop, adequate time is provided to initiate emergency procedures to cool the core.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 204 TO FACILITY OPERATING LICENSE NO. DPR-77

AND AMENDMENT NO. 194 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 application dated April 6, 1995, the Tennessee Valley Authority (the licensee) proposed an amendment to the Technical Specifications (TS) for Sequoyah Nuclear Plant (SQN) Units 1 and 2. The requested changes would delete TS 3/4.9.7, "Crane Travel - Spent Fuel Pool Area," Figure 3.9-1 that is referenced by TS 3.9.7, Surveillance Requirements (SRs) 4.9.7.1 and 4.9.7.2, and associated Bases. The information and controls provided by the specifications would be relocated to administratively controlled procedures.

TS 3.9.7 contains restrictions for moving heavy loads over the fuel assemblies in the spent fuel pool (SFP). It is applicable whenever fuel assemblies are in the SFP or in the cask loading area of the cask pit and specifies that whenever the specifications are not satisfied, the crane load be placed in a safe condition. SR 4.9.7.1 contains requirements for testing crane interlocks and physical stops. SR 4.9.7.2 addresses administrative requirements concerning the impact shield.

2.0 BACKGROUND

Section 182a of the Atomic Energy Act requires applicants for nuclear power plant operating licenses to state TS to be included as part of the license. The Commission's regulatory requirements related to the content of TS are set forth in 10 CFR 50.36. That regulation requires that the TS include items in five specific categories, including (1) safety limits, limiting safety system settings and limiting control settings; (2) limiting conditions for operation; (3) surveillance requirements; (4) design features; and (5) administrative controls. However, the regulation does not specify the particular requirements to be included in a plant's TS.

The Commission has provided guidance for the contents of TS in its "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors" ("Final Policy Statement"), 58 Federal Register (FR) 39132 (July 22, 1993), in which the Commission indicated that compliance with the Final Policy Statement satisfies §182a of the Act. In particular, the Commission indicated that certain items could be relocated from the TS to licensee-controlled documents, consistent with the standard enunciated in *Portland General*

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*Electric Co. (Trojan Nuclear Plant), ALAB-531, 9 NRC 263, 273 (1979).* In that case, the Atomic Safety and Licensing Appeal Board indicated that "technical specifications are to be reserved for those matters as to which the imposition of rigid conditions or limitations upon reactor operation is deemed necessary to obviate the possibility of an abnormal situation or event giving rise to an immediate threat to the public health and safety."

Consistent with this approach, the Final Policy Statement identified four criteria to be used in determining whether a particular matter is required to be included in the TS, as follows: (1) installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary; (2) a process variable, design feature, or operating restriction that is an initial condition of a Design Basis Accident or Transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier; (3) a structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a Design Basis Accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier; and (4) a structure, system, or component which operating experience or probabilistic safety assessment has shown to be significant to public health and safety.<sup>1</sup> As a result, existing TS requirements which fall within or satisfy any of the criteria in the Final Policy Statement must be retained, while those TS requirements which do not fall within or satisfy these criteria may be relocated to other, licensee-controlled documents.

### 3.0 EVALUATION

#### 3.1 TS 3.9.7 Control of Heavy Loads

A potential release of radioactive material from fuel may occur during the refueling process as a result of fuel-cladding failures, mechanical damage caused by the dropping of fuel assemblies, or the dropping of objects onto fuel assemblies. The restriction of movement of loads in excess of 2100 pounds over fuel assemblies ensures that, in the event the load is dropped, the potential activity released will be limited to that contained in a single fuel assembly and that any distortion of fuel in the SFP racks will not result in a critical configuration. This TS applies to the prevention of a heavy-load-drop accident and ensures that the damage caused by the load is limited to the equivalent of one fuel assembly. This assumption is consistent with the activity released that is assumed in the design basis accident analysis for a fuel handling accident.

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<sup>1</sup>The Commission recently promulgated a proposed change to 10 CFR 50.36, pursuant to which the rule would be amended to codify and incorporate these criteria (59 FR 48180). The Commission's Final Policy Statement specified that only limiting conditions for Reactor Core Isolation Cooling, Isolation Condenser, Residual Heat Removal, Standby Liquid Control, and Recirculation Pump Trip, meet the guidance for inclusion in the TS under Criterion 4 (58 FR 39137). The Commission has solicited public comments on the scope of Criterion 4, in the pending rulemaking.

### 3.2 SR 4.9.7.1 Crane Interlocks and Physical Stops

TS 4.0.1 requires that SRs be met during the operational modes or other conditions specified for the limiting conditions for operation unless otherwise stated in the individual SR. During implementation of Amendment Numbers 167 and 157 for SQN Units 1 and 2 respectively, dated April 28, 1993, to increase the capacity of the SFP by replacing the existing fuel storage racks with those of a different design, an inconsistency was determined to exist with TS 4.9.7.1. This SR requires the crane interlocks and physical stops that prevent crane hook travel over the storage pool be demonstrated operable within 7 days prior to crane use and at least once per 7 days thereafter during crane operation. However, with the interlocks and physical stops functioning, all loads are prevented from traveling over the SFP, regardless of weight, since the interlocks are activated only by crane position near the SFP, regardless of the magnitude of the load. Therefore, in order to use the crane to modify the SFP racks, it was necessary to issue Amendment Numbers 194 and 185 for SQN Units 1 and 2, respectively, dated January 24, 1995, to allow the crane interlocks and physical stops to be bypassed under administrative controls.

This resolved the issue of crane operation for the SFP rereacking modification. However, the crane is also designed to serve other needs for both Units 1 and 2, such as handling fuel casks, placement of new fuel in the new fuel storage vault, movement of the new fuel from the new fuel storage vault to the fuel elevator, removal of the shield plugs at the equipment access doors of the reactor building, and movement of large components into or out of the reactor building by way of the auxiliary building. In addition, the crane is used to maneuver equipment needed for fuel inspections and gate relocation. A literal application of the surveillance requirements would prevent performance of any of these evolutions.

### 3.3 CONCLUSION

The staff evaluated the proposed amendment against the four Final Policy Statement criteria given in Section 2 above and determined that each of the four criteria are satisfied as follows:

- (1) The crane travel and load limit TS do not apply to instrumentation used to detect, and indicate in the control room, significant degradation of the reactor coolant pressure boundary.
- (2) Even though a fuel handling event is considered to be a design basis accident, Criterion 2 does not apply. For the Chapter 15 (SRP Section 15.7.4) fuel handling accident analysis, one of the initial conditions is that only one fuel assembly is involved in the accident. The crane interlocks are a design feature that are in place to prevent exceeding this initial condition, not a design feature that is an initial condition in and of itself, and the load limit is an operational feature that is meant to prevent exceeding the initial condition (damage to more than one fuel assembly). Therefore, the load limit and interlocks are provided to prevent operation in a condition that could result in an unanalyzed event or accident if a load drop were to occur. As specified

in SRP Section 15.7.4, the movement of heavy loads (loads greater than the specified limit) are not covered by the Chapter 15 accident analysis.

- (3) The crane travel and load limit TS do not apply to a structure, system, or component that is part of the primary success path and do not function or actuate to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge in the integrity of a fission product barrier.
- (4) The auxiliary building crane and associated equipment, and the load limitations, were not included in the SQN Individual Plant Evaluation, nor is it known to be significant based on any other individual plant evaluations or operating experience.

Where necessary, SQN has addressed the requirements of NUREG-0612 that prevent the movement of heavy loads over fuel assemblies in the SFP as described in the SQN Updated Final Safety Analysis Report Section 9.1.2, "Spent Fuel Storage," in various plant procedures. The procedural administrative controls are contained in Administrative Instruction-41, "Auxiliary Building Crane Travel Interlocks," which governs the bypassing of the interlocks that prevent the crane bridge from traveling over the SFP when the hook is aligned to travel over the SFP. This procedure requires documentation of the description of the work to be performed, a certified crane operator/relief operator be provided, and permission from the shift supervisor be obtained.

Upon approval of this amendment, the licensee will relocate the existing TS requirements to the administrative procedures that govern crane operation, and the crane design is described in the Updated Final Safety Analysis such that future changes to these procedures can be made pursuant to 10 CFR 50.59. In order to avoid any confusion regarding the relationship between the crane load limits and the surveillance requirements for the interlocks and physical stops, the staff suggests that the crane operation procedures clearly identify the loads over the spent fuel pool that have been specifically analyzed under the existing licensing basis to permit the crane interlocks and physical stops to be defeated. Different operation or loading conditions in the future will have to be evaluated to determine whether such differences involve an increase in the probability or consequences of a load drop accident, or a reduction in the margin of safety in accordance with 10 CFR 50.59.

On this basis, the staff concludes that these requirements do not need to be controlled by TS and adequate procedural controls will be in effect. Changes to these procedures, should they be required in the future, will be adequately controlled by 10 CFR 50.59. The staff has concluded, therefore, that relocation of the crane operation requirements described above is acceptable since their inclusion in the TS is not specifically required by 10 CFR 50.36 or other regulations and the requirements governing the auxiliary crane movement in relation to the SFP are not required to avert an immediate threat to the public health and safety.

#### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Tennessee State official was notified of the proposed issuance of the amendment. The State official had no comments.

#### 5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and a surveillance requirement. The NRC 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 the amendment involves no significant hazards consideration, and there has been no public comment on such finding (60 FR 20529). 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 or environmental assessment need be prepared in connection with the issuance of the amendment.

#### 6.0 CONCLUSION

The Commission 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, (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.

Principal Contributor: David E. LaBarge

Dated: June 14, 1995

Mr. Oliver D. Kingsley, Jr.  
Tennessee Valley Authority

SEQUOYAH NUCLEAR PLANT

cc:

Mr. O. J. Zeringue, Sr. Vice President  
Nuclear Operations  
Tennessee Valley Authority  
3B Lookout Place  
1101 Market Street  
Chattanooga, TN 37402-2801

TVA Representative  
Tennessee Valley Authority  
11921 Rockville Pike  
Suite 402  
Rockville, MD 20852

Dr. Mark O. Medford, Vice President  
Engineering & Technical Services  
Tennessee Valley Authority  
3B Lookout Place  
1101 Market Street  
Chattanooga, TN 37402-2801

Regional Administrator  
U.S. Nuclear Regulatory Commission  
Region II  
101 Marietta Street, NW., Suite 2900  
Atlanta, GA 30323

Mr. D. E. Nunn, Vice President  
New Plant Completion  
Tennessee Valley Authority  
3B Lookout Place  
1101 Market Street  
Chattanooga, TN 37402-2801

Mr. William E. Holland  
Senior Resident Inspector  
Sequoyah Nuclear Plant  
U.S. Nuclear Regulatory Commission  
2600 Igou Ferry Road  
Soddy Daisy, TN 37379

Mr. R. J. Adney, Site Vice President  
Sequoyah Nuclear Plant  
Tennessee Valley Authority  
P.O. Box 2000  
Soddy Daisy, TN 37379

Mr. Michael H. Mobley, Director  
Division of Radiological Health  
3rd Floor, L and C Annex  
401 Church Street  
Nashville, TN 37243-1532

General Counsel  
Tennessee Valley Authority  
ET 11H  
400 West Summit Hill Drive  
Knoxville, TN 37902

County Judge  
Hamilton County Courthouse  
Chattanooga, TN 37402-2801

Mr. P. P. Carrier, Manager  
Corporate Licensing  
Tennessee Valley Authority  
4G Blue Ridge  
1101 Market Street  
Chattanooga, TN 37402-2801

Mr. Ralph H. Shell  
Site Licensing Manager  
Sequoyah Nuclear Plant  
Tennessee Valley Authority  
P.O. Box 2000  
Soddy Daisy, TN 37379