



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
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DOCKET NOS 50-327 and 50-328

MEMORANDUM FOR: Regulatory Publications Branch
 Division of Freedom of Information and Publications Services
 Office of Administration and Resources Management

FROM: Office of Nuclear Reactor Regulation

SUBJECT: TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANTS, UNITS 1 AND 2

One signed original of the *Federal Register* Notice identified below is enclosed for your transmittal to the Office of the Federal Register for publication. Additional conformed copies (5) of the Notice are enclosed for your use

- Notice of Receipt of Application for Construction Permit(s) and Operating License(s).
- Notice of Receipt of Partial Application for Construction Permit(s) and Facility License(s): Time for Submission of Views on Antitrust Matters.
- Notice of Consideration of Issuance of Amendment to Facility Operating License. (Call with 30 -day insert date).
- Notice of Receipt of Application for Facility License(s); Notice of Availability of Applicant's Environmental Report; and Notice of Consideration of Issuance of Facility License(s) and Notice of Opportunity for Hearing.
- Notice of Availability of NRC Draft/Final Environmental Statement.
- Notice of Limited Work Authorization.
- Notice of Availability of Safety Evaluation Report.
- Notice of Issuance of Construction Permit(s).
- Notice of Issuance of Facility Operating License(s) or Amendment(s).
- Order.
- Exemption.
- Notice of Granting Exemption.
- Environmental Assessment.
- Notice of Preparation of Environmental Assessment.
- Receipt of Petition for Director's Decision Under 10 CFR 2.206.
- Issuance of Final Director's Decision Under 10 CFR 2.20f.
- Other: _____

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Enclosure:
 As stated

Project Directorate II-4

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UNITED STATES NUCLEAR REGULATORY COMMISSION

TENNESSEE VALLEY AUTHORITY

DOCKET NOS. 50-327 AND 50-328

NOTICE OF CONSIDERATION OF ISSUANCE OF AMENDMENT TO
FACILITY OPERATING LICENSE, PROPOSED NO SIGNIFICANT HAZARDS
CONSIDERATION DETERMINATION, AND OPPORTUNITY FOR HEARING

The U.S. Nuclear Regulatory Commission (the Commission) is considering issuance of an amendment to Facility Operating License No. DPR-77 and DPR-79 issued to the Tennessee Valley Authority (the licensee) for operation of the Sequoyah Nuclear Plant, Units 1 and 2 located in Hamilton County, Tennessee.

The proposed amendment would increase the storage capacity of the spent fuel pool from its present 1386 storage cells to 2091 storage cells. This would be accomplished by replacing the present medium density fuel racks with 12 free-standing, self-supporting, high density rack modules constructed of stainless steel and a neutron absorber material (boron carbide and aluminum-composite sandwich, product name "boral"). The proposed change would extend the limit when full core discharge capacity is no longer available for one reactor from the present date of 1996 to 2003 or 2004.

In addition, the proposed amendment would add controls affecting the fuel arrangement and spacing of fuel in the spent fuel pool, revise related surveillance requirements, address controls for fuel movement over the cask loading area of the spent fuel pool, revise the operability requirements of the crane interlocks and physical stops, address

additional fuel storage capacity in the cask loading area, and incorporate other related information.

Before issuance of the proposed license amendment, the Commission will have made findings required by the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations.

The Commission has made a proposed determination that the amendment request involves no significant hazards consideration. Under the Commission's regulations in 10 CFR 50.92, this means that operation of the facility in accordance with the proposed amendment would not (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety. As required by 10 CFR 50.91(a), the licensee has provided its analysis of the issue of no significant hazards consideration, which is presented below:

TVA has evaluated the proposed technical specification (TS) changes and has determined that they do not represent a significant hazards consideration based on criteria established in 10 CFR 50.92(c).

Operation of Sequoyah in accordance with the proposed amendment will not:

- (1) Involve a significant increase in the probability or consequences of an accident previously evaluated.

The following potential scenarios were considered:

1. A spent-fuel assembly drop.
2. Drop of the transfer canal gate or the divider gate in the spent-fuel pool.
3. A seismic event.
4. Loss of cooling flow in the spent-fuel pool.

5. Installation activities.

The effect of additional spent-fuel pool storage cells fully loaded with fuel on the first four potential accident scenarios listed above has been reviewed. It was concluded that after installation activities have been completed, the presence of additional fuel in the pool does not increase the probability of occurrence of these four events.

With regard to installation activities, the existing Sequoyah TSs prohibit loads in excess of 2100 pounds from travel over fuel assemblies in the storage pool and require the associated crane interlocks and physical stops be periodically demonstrated operable. During installation, racks and associated handling tools will be moved over the spent-fuel pool but movement over fuel will be prohibited. All installation work in the spent-fuel-pit area will be controlled and performed in strict accordance with specific written procedures.

NRC regulations provide that, in lieu of providing a single failure-proof crane system, the control of heavy loads guidelines can be satisfied by establishing that the potential for a heavy load drop is extremely small. Storage rack movements to be accomplished with the Sequoyah auxiliary building crane will conform with NUREG-0612 guidelines, in that the probability of a drop of a storage rack is extremely small. The crane has a tested capacity of 80 tons. The maximum weight of any existing or replacement storage rack and its associated handling tool is less than 15 tons. Therefore, there is ample safety factor margin for movements of the storage racks by the auxiliary building crane. Special lifting devices, which have redundancy or a rated capacity sufficient to maintain adequate safety factors, will also be utilized in the movements of the storage racks. In accordance with NUREG-0612, Appendix B, the safety margin ensures that the probability of a load drop is extremely low.

Load travel over fuel stored in the cask loading area of the cask pit will be minimized and, in any case, will be prohibited unless an impact shield, which has been specifically designed for this purpose, is covering the area. Loads that are permitted when the shield is in place must meet analytically determined weight, travel height, and cross-sectional area criteria that preclude penetration of the shield. A TS has been proposed that incorporates the previously mentioned load criteria.

A fuel movement and rack changeout sequence has been developed that illustrates that it will not be necessary to carry

existing or new racks over fuel in the cask loading area or any region of the pool containing fuel. A lateral-free zone clearance from stored fuel shall be maintained. Accordingly, it is concluded that the proposed installation activities will not significantly increase the probability of a load-handling accident. The consequences of a load-handling accident are unaffected by the proposed installation activities.

The consequences of a spent-fuel assembly drop were evaluated, and it was determined that the racks will not be distorted such that they would not perform their safety function. The criticality acceptance criterion, Keff less than or equal to 0.95, is not violated, and the calculated doses are well within 10 CFR Part 100 guidelines. Thus, the consequences of this type of accident are not changed from previously evaluated spent-fuel assembly drops that have been found acceptable by NRC.

The existing TSs permit the transfer-canal gate and the divider gate in the spent-fuel pool to travel over fuel assemblies in the spent-fuel pool. Analysis showed that this drop caused less damage to the new racks than the fuel assembly drop when it impacts the top of the rack. Rack damage is restricted to an area above the active fuel region.

The consequences of a seismic event have been evaluated. The new racks are designed and will be fabricated to meet the requirements of applicable portions of the NRC regulatory guides and published standards. Design margins have been provided for rack tilting, deflection, and movement such that the racks do not impact each other or the spent-fuel-pit walls in the active fuel region during the postulated seismic events. The new free-standing racks are designed to maintain their integrity during and after a seismic event. The fuel assemblies also remain intact and therefore no criticality concerns exist.

The spent-fuel pool system is a passive system with the exception of the fuel pool cooling train and heating, ventilating, and air-conditioning (HVAC) equipment. Redundancies in the cooling train and HVAC hardware are not reduced by the planned fuel storage densification. The potential increased heat load resulting from any additional storage of spent fuel is well within the existing system cooling capacity. Therefore, the probability of occurrence [of a] malfunction of safety equipment leading to the loss of cooling flow in the spent-fuel pool is not significantly affected. Furthermore, the consequences of this type incident are not significantly increased from previously evaluated cooling system loss of flow malfunctions. Thermal-hydraulic scenarios assume the reracked pool is approximately 85 percent full

with spent fuel assemblies. From this starting point, the remaining storage capacity is utilized by analyzing both normal back-to-back and unplanned full core offloads using conservative assumptions and previously established methods. Calculated values include maximum pool water bulk temperature, coincident maximum pool water local temperature, the maximum fuel cladding temperature, time-to-boil after loss of cooling paths, and the effect of flow blockage in a storage cell.

Although the proposed modification increases the pool heat load, results from the above analyses yield a maximum bulk temperature of approximately 180 degrees Fahrenheit which is below the bulk boiling temperature. Also, the maximum local water temperature is below nucleate boiling condition values. Associated results from corresponding loss of cooling evaluations give minimums of 3.4 hours before boiling begins and 30 hours before the pool water level drops to the minimum required for shielding spent fuel. This is sufficient time to begin utilization of available alternate sources of makeup cooling water. Also, the effect of the increased thermal loading on the pool structure was evaluated and determined to be acceptable.

- (2) Create the possibility of a new or different kind of accident from any accident previously analyzed.

The proposed modification has been evaluated in accordance with the guidance of the NRC position paper entitled, "OT Position for Review and Acceptance of Spent-Fuel Storage and Handling Applications"; appropriate NRC regulatory guides; appropriate NRC standard review plans; and appropriate industry codes and standards. Proven analytical technology was used in designing the planned fuel storage expansion and will be utilized in the installation process. Basic reracking technology has been developed and demonstrated in over 80 applications for fuel pool capacity increases that have already received NRC staff approval.

The TSs for the existing spent-fuel storage racks use burnup credit and fuel assembly administrative placement restrictions for criticality control. The change to three-zone storage in the spent-fuel pool is described in the proposed change to the design features section of the TSs. Additional evaluations were required to ensure that the criticality criterion is maintained. These include the evaluation for the limiting criticality condition, i.e., the abnormal placement of an unirradiated (fresh) fuel assembly of 4.95 weight percent enrichment into a storage cell location for irradiated fuel meeting the highest rack design burnup criterion. The evaluation for this case shows that the reactivity would exceed the limit in the absence of soluble boron. Soluble boron, for

which credit is permitted under these abnormal conditions, ensures that reactivity is maintained substantially less than the design requirement. Calculations indicate that a soluble poison concentration of 685 parts per million (ppm) boron would be required to limit the maximum reactivity to a Keff of 0.95, including uncertainties. This is less than the existing and proposed TS requirements of 2000 ppm.

It is not physically possible to install a fuel assembly outside and adjacent to a storage module in the spent-fuel storage pool. However, for a storage module installed in the cask loading area of the cask pit, there would be sufficient room for such an extraneous assembly. The module in this area is administratively limited by the proposed TS change to spent fuel only, and calculations show that the maximum Keff remains well below the 0.95 limit under this postulated accident condition, even in the absence of soluble boron. To provide reactivity control assurance for the abnormal placement of a fresh assembly in the cask loading area module, a modification to the existing TS has been proposed that requires boron concentration measurements while handling fuel in that area.

Although these changes required addressing additional aspects of a previously analyzed accident, the possibility of a previously unanalyzed accident is not created. It is therefore concluded that the proposed reracking does not create the possibility of a new or different kind of accident from any previously analyzed.

- (3) Involve a significant reduction in a margin of safety.

The design and technical review process applied to the reracking modification included addressing the following areas:

1. Nuclear criticality considerations.
2. Thermal-hydraulic considerations.
3. Mechanical, material, and structural considerations.

The established acceptance criterion for criticality is that the neutron multiplication factor shall be less than or equal to 0.95, including all uncertainties. The results of the criticality analysis for the new rack design demonstrate that this criterion is satisfied. The methods used in the criticality analysis conform to the applicable portions of NRC guidance and industry codes, standards and specifications. In meeting the acceptance criteria for criticality in the spent-fuel pool and the cask loading area, such that Keff is always less than 0.95 at a 95/95 percent probability tolerance level,

the proposed amendment does not involve a significant reduction in the margin of safety for nuclear criticality.

Conservative methods and assumptions were used to calculate the maximum fuel temperature and the increase in temperature of the water in the spent-fuel-pit area. The thermal-hydraulic evaluation used methods previously employed. The proposed storage modification will increase the heat load in the spent-fuel pool, but the evaluation shows that the existing spent-fuel cooling system will maintain the bulk pool water temperature at or below 180 degrees Fahrenheit. Thus it is demonstrated that the worst-case peak value of the pool bulk temperature is considerably lower than the bulk boiling temperature. Evaluation also shows that maximum local water temperatures along the hottest fuel assembly are below the nucleate boiling condition value. Thus there is no significant reduction in the margin of safety for thermal hydraulic or spent-fuel cooling considerations.

The mechanical, material, and structural design of the new spent-fuel racks is in accordance with applicable portions of "NRC OT Position for Review and Acceptance of Spent-Fuel Storage and Handling Applications," dated April 14, 1978 (as modified January 18, 1979), as well as other applicable NRC guidance and industry codes. The primary safety function of the spent-fuel racks is to maintain the fuel assemblies in a safe configuration through all normal and abnormal loading conditions. Abnormal loadings that have been evaluated with acceptable results and discussed previously include the effect of an earthquake and the impact because of the drop of a fuel assembly. The rack materials used are compatible with the fuel assemblies and the environment in the spent-fuel pool. The structural design for the new racks provides tilting, deflection, and movement margins such that the racks do not impact each other or the spent-fuel-pit walls in the active fuel region during the postulated seismic events. Also the spent-fuel assemblies themselves remain intact and no criticality concerns exist. In addition, finite element analysis methods were used to evaluate the continued structural acceptability of the spent-fuel pit. The analysis was performed in accordance with "Building Code Requirements for Reinforced Concrete" (ACI 318-63,77). Therefore, with respect to mechanical, material, and structural considerations, there is no significant reduction in a margin of safety.

The NRC has reviewed the licensee's analysis and, based on this review, it appears that the three standards of 10 CFR 50.92(c) are

satisfied. Therefore, the NRC staff proposes to determine that the amendment request involves no significant hazards consideration.

The Commission is seeking public comments on this proposed determination. Any comments received within thirty (30) days after the date of publication of this notice will be considered in making any final determination. The Commission will not normally make a final determination unless it receives a request for a hearing.

Written comments may be submitted by mail to the Rules and Directives Review Branch, Division of Freedom of Information and Publications Services, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555, and should cite the publication date and page number of this FEDERAL REGISTER notice. Written comments may also be delivered to Room P-223, Phillips Building, 7920 Norfolk Avenue, Bethesda, Maryland, from 7:30 a.m. to 4:15 p.m. Federal workdays. Copies of written comments received may be examined at the NRC Public Document Room, the Gelman Building, 2120 L Street, NW., Washington, DC 20555. The filing of requests for hearing and petitions for leave to intervene is discussed below.

By July 24, 1992, the licensee may file a request for a hearing with respect to issuance of the amendment to the subject facility operating license and any person whose interest may be affected by this proceeding and who wishes to participate as a party in the proceeding must file a written request for a hearing and a petition for leave to intervene. Requests for a hearing and a petition for leave to intervene shall be filed in accordance with the Commission's "Rules of Practice for Domestic

Licensing Proceedings" in 10 CFR Part 2. Interested persons should consult a current copy of 10 CFR 2.714 which is available at the Commission's Public Document Room, the Gelman Building, 2120 L Street, NW., Washington, DC 20555 and at the local public document room located at the Chattanooga-Hamilton County Library, 1101 Broad Street, Chattanooga, Tennessee 37402. If a request for a hearing or petition for leave to intervene is filed by the above date, the Commission or an Atomic Safety and Licensing Board, designated by the Commission or by the Chairman of the Atomic Safety and Licensing Board, will rule on the request and/or petition; and the Secretary or the designated Atomic Safety and Licensing Board will issue a notice of hearing or an appropriate order.

As required by 10 CFR 2.714, a petition for leave to intervene shall set forth with particularity the interest of the petitioner in the proceeding, and how that interest may be affected by the results of the proceeding. The petition should specifically explain the reasons why intervention should be permitted with particular reference to the following factors: (1) the nature of the petitioner's right under the Act to be made party to the proceeding; (2) the nature and extent of the petitioner's property, financial, or other interest in the proceeding; and (3) the possible effect of any order which may be entered in the proceeding on the petitioner's interest. The petition should also identify the specific aspect(s) of the subject matter of the proceeding as to which petitioner wishes to intervene. Any person who has filed a petition for leave to intervene or who has been admitted as a party may amend the petition without requesting leave of the Board up to fifteen (15) days prior to the first prehearing conference scheduled in the proceeding, but such an

amended petition must satisfy the specificity requirements described above.

Not later than fifteen (15) days prior to the first prehearing conference scheduled in the proceeding, a petitioner shall file a supplement to the petition to intervene which must include a list of the contentions which are sought to be litigated in the matter. Each contention must consist of a specific statement of the issue of law or fact to be raised or controverted. In addition, the petitioner shall provide a brief explanation of the bases of the contention and a concise statement of the alleged facts or expert opinion which support the contention and on which the petitioner intends to rely in proving the contention at the hearing. The petitioner must also provide references to those specific sources and documents of which the petitioner is aware and on which the petitioner intends to rely to establish those facts or expert opinion. Petitioner must provide sufficient information to show that a genuine dispute exists with the applicant on a material issue of law or fact. Contentions shall be limited to matters within the scope of the amendment under consideration. The contention must be one which, if proven, would entitle the petitioner to relief. A petitioner who fails to file such a supplement which satisfies these requirements with respect to at least one contention will not be permitted to participate as a party.

Those permitted to intervene become parties to the proceeding, subject to any limitations in the order granting leave to intervene, and have the opportunity to participate fully in the conduct of the hearing, including the opportunity to present evidence and cross-examine witnesses.

If a hearing is requested, the Commission will make a final determination on the issue of no significant hazards consideration. The

final determination will serve to decide when the hearing is held.

If the final determination is that the amendment request involves no significant hazards consideration, the Commission may issue the amendment and make it immediately effective, notwithstanding the request for a hearing. Any hearing held would take place after issuance of the amendment.

If the final determination is that the amendment request involves a significant hazards consideration, any hearing held would take place before the issuance of any amendment.

Normally, the Commission will not issue the amendment until the expiration of the 30-day notice period. However, should circumstances change during the notice period such that failure to act in a timely way would result, for example, in derating or shutdown of the facility, the Commission may issue the license amendment before the expiration of the 30-day notice period, provided that its final determination is that the amendment involves no significant hazards consideration. The final determination will consider all public and State comments received. Should the Commission take this action, it will publish in the FEDERAL REGISTER a notice of issuance and provide for opportunity for a hearing after issuance. The Commission expects that the need to take this action will occur very infrequently.

A request for a hearing or a petition for leave to intervene must be filed with the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Services Branch, or may be delivered to the Commission's Public Document Room, the Gelman Building, 2120 L Street, NW., Washington, DC 20555, by the above

date. Where petitions are filed during the last ten (10) days of the notice period, it is requested that the petitioner promptly so inform the Commission by a toll-free telephone call to Western Union at 1-(800) 325-6000 (in Missouri 1-(800) 342-6700). The Western Union operator should be given Datagram Identification Number 3737 and the following message addressed to Frederick J. Hebdon: petitioner's name and telephone number, date petition was mailed, plant name, and publication date and page number of this FEDERAL REGISTER notice. A copy of the petition should also be sent to the Office of the General Counsel, U.S. Nuclear Regulatory Commission, Washington, DC 20555, and to General Counsel, Tennessee Valley Authority, 400 West Summit Hill Drive, ET 11H, Knoxville, Tennessee 37902.

Nontimely filings of petitions for leave to intervene, amended petitions, supplemental petitions and/or requests for hearing will not be entertained absent a determination by the Commission, the presiding officer or the presiding Atomic Safety and Licensing Board that the petition and/or request should be granted based upon a balancing of the factors specified in 10 CFR 2.714(a)(1)(i)-(v) and 2.714(d).

The Commission hereby provides notice that this is a proceeding on an application for a license amendment falling within the scope of section 134 of the Nuclear Waste Policy Act of 1982 (NWPAA), 42 U.S.C. 10154. Under section 134 of the NWPAA, the Commission, at the request of any party to the proceeding must use hybrid hearing procedures with respect to "any matter which the Commission determines to be in controversy among the parties." The hybrid procedures in section 134 provide for oral argument on matters in controversy, proceeded by discovery under the Commission's rules, and the designation, following argument, of only those factual issues that

involve a genuine and substantial dispute, together with any remaining questions of law, to be resolved in an adjudicatory hearing. Actual adjudicatory hearings are to be held on those issues found to meet the criteria of section 134 and set for hearing after oral argument.

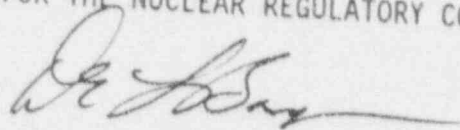
The Commission's rules implementing section 134 of the NHPA are found in 10 CFR Part 2, Subpart K, "Hybrid Hearing Procedures for Expansion of Spent Nuclear Fuel Storage Capacity at Civilian Nuclear Power Reactors" (published at 50 FR 41670, October 15, 1985) to 10 CFR 2.1101 et seq. Under those rules, any party to the proceeding may invoke the hybrid hearing procedures by filing with the presiding officer a written request for oral argument under 10 CFR 2.1109. To be timely, the request must be filed within 10 days of an order granting a request for hearing or petition to intervene. (As outlined above, the Commission's rules in 10 CFR Part 2, Subpart G, and 2.714 in particular, continue to govern the filing of requests for a hearing or petitions to intervene, as well as the admission of contentions.) The presiding officer shall grant a timely request for oral argument. The presiding officer may grant untimely request for oral argument only upon showing of good cause by the requesting party for the failure to file on time and after providing the other parties an opportunity to respond to the untimely request. If the presiding officer grants a request for oral argument, any hearing held on the application shall be conducted in accordance with hybrid hearing procedures. In essence, those procedures limit the time available for discovery and require that an oral argument be held to determine whether any contentions must be resolved in adjudicatory hearing. If no party to the proceedings

requests oral argument, or if all untimely requests for oral argument are denied, then the usual procedures in 10 CFR Part 2, Subpart G, apply.

For further details with respect to this action, see the application for amendment dated March 27, 1992, and revisions to this submittal dated May 11, 1992 and May 28, 1992, which are available for public inspection at the Commission's Public Document Room, the Gelman Building, 2120 L Street, NW., Washington, DC 20555 and at the local public document room located at the Chattanooga-Hamilton County Library, 1101 Broad Street, Chattanooga, Tennessee 37402

Dated at Rockville, Maryland, this 19th day of June 1992

FOR THE NUCLEAR REGULATORY COMMISSION



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Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation