

December 14, 1987

327
Docket Nos. 50-237/328

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

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Dear Mr. White:

SUBJECT: EXEMPTION FROM 10 CFR PART 50, APPENDIX A, GENERAL DESIGN CRITERION (GDC) 55 FOR RESIDUAL HEAT REMOVAL LINE (TAC 64623, 64624)

Re: Sequoyah Nuclear Plant, Units 1 and 2

By letter dated February 3, 1987, supplemented by letter dated April 8, 1987, Tennessee Valley Authority (TVA) requested exemptions from 10 CFR Part 50, Appendix A, GDC 55 and 56 for the Residual Heat Removal (RHR) Supply Line and Vacuum Relief Lines, respectively. This letter transmits the NRC staff evaluation of your exemption request for the RHR Supply Line only. The evaluation of your request for exemption to GDC 56 for the Vacuum Relief Lines is the subject of a separate licensing action.

NRC staff has reviewed your request referenced above and has granted an exemption from the requirements of 10 CFR Part 50, Appendix A, GDC 55 for the RHR Supply Line containment isolation valves for valve location.

This exemption is effective upon the date of issuance. The exemption is being forwarded to the Office of the Federal Register for publication.

Sincerely,

Original signed by:

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

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Enclosure:
Exemption

cc w/enclosure
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SEbnetter
12/1/87

Mr. S. A. White
Tennessee Valley Authority

Sequoyah Nuclear Plant

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

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of

TENNESSEE VALLEY AUTHORITY

(Sequoyah Nuclear Plant, Units 1 and 2)

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Docket Nos. 50-327
50-328

EXEMPTION

I.

The Tennessee Valley Authority (the licensee) is the holder of Facility Operating Licenses No. DPR-77 and DPR-79 which authorize operation of the Sequoyah Nuclear Plant, Units 1 and 2, respectively. These licenses provide that, among other things, the facility is subject to all rules, regulations and Orders of the Commission now or hereafter in effect.

The Sequoyah facility consists of two pressurized water reactors located at the licensee's site in Hamilton County, Tennessee.

II.

General Design Criterion (GDC) 55 of Appendix A to 10 CFR Part 50 requires that each reactor coolant pressure boundary line penetrating the primary reactor containment be provided with containment isolation valves. The combination of valves is to be one inside and one outside containment and either automatic or locked closed. The GDC does allow for a demonstration of acceptability on some other defined basis.

As part of the original design of Sequoyah Nuclear Plant, Units 1 and 2, TVA relied upon certain closed systems as the outside containment isolation barrier to meet the Commission's regulations, specifically GDC-55 and 56, on some "other defined basis." The NRC staff issued NUREG-0011, dated March

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1979, which documents the acceptability of TVA's compliance with the GDC; however, the staff did not specifically address the acceptability of an "other defined basis" for any containment isolation configurations.

Subsequent to the development of the TMI Action Plan, NRC staff policy has been established that closed systems outside containment are not generally acceptable as an isolation barrier for lines covered by GDC 55 and 56.

As a result of an NRC staff inspection conducted at Sequoyah in March 1986, apparent discrepancies in system compliance with the containment isolation requirements were identified. These findings led to a general reassessment of the containment isolation design and the "other defined basis" assumptions made for the Sequoyah Nuclear Plant, Units 1 and 2.

Subsequent to discussions with TVA, by letter dated January 2, 1987 TVA redesignated certain existing system line isolation valves as containment isolation valves. The Commission's requirements, however, could not be met in every isolated case. In most of the cases evaluated, the explicit requirements of GDC 55 or 56 could be satisfied by valve redesignation, thereby imposing them to the associated operability, surveillance, and testing requirements. For those cases where the staff requirements could not be met, TVA has requested an exemption from the GDC.

This exemption addresses the Sequoyah Nuclear Plant, Units 1 and 2, containment isolation valves in the Residual Heat Removal (RHR) System loop supply line with respect to the valve location requirements only.

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The containment isolation provisions for the Sequoyah Nuclear Plant, Units 1 and 2 RHR System reactor coolant loop supply (discharge line) through penetration X-17 utilizes a check valve and a motor-operated remote manual valve inside containment and a water seal and closed system outside containment. The licensee has designated this inboard remote manual valve as a containment isolation valve. This valve, therefore, is subject to appropriate operability, surveillance and testing requirements, and thereby, in combination with the inboard check valve, satisfies the redundancy requirements of GDC 55. While the designation of the motor-operated valve as a containment isolation valve is necessary, this change does not bring the isolation design into compliance with the requirements of GDC 55.

Although the licensee has provided an isolation design which satisfies the GDC in terms of redundancy of valves, it is not in compliance with the requirement of GDC 55 concerning valve location. The location of both containment isolation valves inside containment clearly does not satisfy the criteria of GDC 55 which specifies a valve inside and outside containment. Allowances for valve location are made in cases where it is impractical to locate valves on either side of the containment, e.g., in a situation where location of an isolation valve inside containment would mean it could be submerged following an accident.

Consequently, by letter dated February 3, 1987, supplemented by letter dated April 8, 1987, the licensee requested an exemption from the valve location requirement of GDC 55 for the RHR loop supply line. The licensee

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contends that an exemption is warranted on the basis that the isolation capability for this line was technically adequate and that further modification to the design was not cost effective.

The licensee has designed the remote manual valve in the RHR loop supply line to the loop 1 and 3 hot legs as a containment isolation valve. This line has multiple isolation provisions; a remote manual valve and two missile-protected check valves inside containment and a closed system outside containment.

The licensee has stated that in addition to the check valve and the remote manual isolation valve there are other isolation barriers that provide protection against leakage to the environment from these penetrations. First, the system outside containment is a closed system designed to seismic Category 1 standards and meets at least Safety Class 2 design requirements. Secondly, these lines are supplied by two RHR pumps which are interconnected to provide a water seal at a pressure sufficient to preclude containment atmospheric leakage.

The NRC staff recognizes that both the water seal and the closed system outside containment are equivalent to a valve as an isolation barrier since both of these barriers can withstand a single active failure. The staff has evaluated the Sequoyah isolation design and exemption request for the RHR loop supply line and concludes that the exemption is justified on the grounds that the existing redundant isolation capability, in consideration of both the water seal and closed system outside containment, provides reasonable assurance against offsite releases and, therefore, application of GDC 55 in these particular circumstances is not necessary to achieve the purpose of the criterion.

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III.

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12, the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. The Commission further determines that special circumstances, as provided in 10 CFR 50.12(a)(2)(ii), are present justifying the exemption--namely, that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule in that the licensee's design meets the underlying intent of GDC 55 which is to provide a redundant means of isolation. The design does this by providing a spring-loaded check valve in series with a remote manual isolation combined with a water seal and a closed system outside containment.

The Commission hereby grants an exemption from the requirements of GDC 55 of Appendix A to 10 CFR Part 50 to the licensee for operation of the Sequoyah Nuclear Plant, Units 1 and 2, in that the RHR loop supply line to the loop 1 and 3 hot legs can be isolated using two check valves and a remote manual valve all of which are located inside containment.

Pursuant to 10 CFR 51.32, the Commission has determined that the issuance of this exemption will have no significant impact on the environment (52 FR 46869, December 10, 1987).

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For further details with respect to this action, see the request for exemption dated February 3, 1987, as supplemented April 8, 1987, which are available for public inspection at the Commission's Public Document Room, 1717 H Street, NW, Washington, D.C., and at the Chattanooga-Hamilton County Library, 1001 Broad Street, Chattanooga, Tennessee 37402.

This exemption is effective upon issuance.

Dated at Bethesda, Maryland this 14th day of December.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in dark ink, appearing to read "Stewart D. Ebnetter", is written over the typed name.

Stewart D. Ebnetter, Director
Office of Special Projects

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December 14, 1987

DOCKET NO.

MEMORANDUM FOR:

Rules and Procedures Branch
Division of Rules and Records
Office of Administration

FROM:

~~Office of Nuclear Reactor Regulation~~ Office of Special Projects

SUBJECT:

TENNESSEE VALLEY AUTHORITY, SEQUOYAH NUCLEAR PLANT, 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 () 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.
- ☐ 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).
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- ☐ Order.
- ☒ Exemption.
- ☐ Notice of Granting Exemption.
- ☐ Environmental Assessment.
- ☐ Notice of Preparation of Environmental Assessment.
- ☐ Other: _____

Carol Jamerson
~~Office of Nuclear Reactor Regulation~~
Office of Special Projects

~~XXXXXXXXXXXX~~

Contact: Carol Jamerson
Phone: 49-28749

OFFICE	OSP:TVA						
SURNAME	PWilson <i>PW</i>						
DATE	12/14/87						