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

October 26, 1988

Docket No. 50-327

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

Dear Mr. White:

SUBJECT: TEMPORARY EXEMPTION TO 10 CFR 50.46(a)(1) - SEQUOYAH NUCLEAR PLANT, UNIT 1 (TAC R0052)

By letter dated September 19, 1988, the Tennessee Valley Authority (TVA) requested a temporary exemption for Unit 1 to the requirement in 10 CFR Part 50.46(a)(1) for an approved Emergency Core Cooling System (ECCS) cooling evaluation using plant operating conditions. In that letter, and its letter dated August 15, 1988, TVA explained that the approved ECCS cooling performance, including the approved Upper Head Injection (UHI) calculation model, as referenced in Section 15.4 of the Sequoyah Final Safety Analysis Report (FSAR), was not based on plant operating conditions for the upcoming Cycle 4 operation and there are corrections needed to the UHI calculation model. The calculations by TVA to demonstrate that the fuel peak cladding temperatures (PCT) are below the acceptance criterion (2200°F) in 10 CFR Part 50.46 were based on sensitivity studies and the calculated ECCS performance in the FSAR. The calculations showed that the PCT was 2,198°F. TVA has accepted operating restrictions for Unit 1 on the maximum allowed heat flux hot channel factor and percentage of steam generator tubes plugged. These restrictions reduce the PCT to more than 100°F below the acceptance criteria in 10 CFR Part 50.46.

Enclosed is the Exemption for Unit 1 from the requirement in 10 CFR Part 50.46(a)(1) for a plant specific ECCS cooling evaluation based on plant operating conditions and with an approved model. The Commission grants this Exemption until May 31, 1989. This is in accordance with the schedule stated in your letter dated September 19, 1988. The Commission has granted this Exemption on the conditions that: (1) the heat flux hot channel factor shall not exceed 2.15, and (2) the steam generator tubes plugged shall not exceed five percent. The bases for this action are included in the enclosed Exemption.

8811030303 881026
PDR ADOCK 05000327
P PNU

DF01
1/1

In your letter dated September 21, 1988, you proposed an amendment to the Unit 1 Technical Specification (TS). The proposal is to reduce the maximum allowed heat flux hot channel in the TS from the current value of 2.237 in the TS to the value of 2.15 required by the Exemption. The staff's action on this amendment request will be the subject of a separate letter after the Notice of Consideration of Issuance of Amendment in the Federal Register has expired. Even though the staff has not issued such an amendment to the Unit 1 TS, you are still required by the Exemption to operate Unit 1 within the conditions of the Exemption.

Sincerely,

Original Signed by

Suzanne Black, Assistant Director
for Projects
TVA Projects Division
Office of Special Projects

Enclosure:
Exemption to 10 CFR 50.46(a)(1)

cc w/enclosure:
See next page

Distribution
Docket File
NRC PDR
Local PDR
Projects Reading
OSP Reading
J. Partlow
S. Richardson
S. Black
B. D. Liaw
F. McCoy
F. Miraglia
B. Grimes
E. Jordan
M. Simms
J. Donohew
J. Rutberg
T. Barnhart (8)
ACRS (10)
GPA/PA
GPA/CA
ARM/LFMB
SQN Rdg. File

with comments incorp. to V D
10/21/88 done 10/28/88 JPD checked with Scinto

OFC	:OSP:TVA/LA	:OSP:TVA/PM	:TVA:AD/P	OGC	:TVA:D	:OSP:D
NAME	:MSimms	:JDonohew	:SBlack		:SRichardson	JPartlow
DATE	:10/11/88	:10/11/88	:10/11/88	:10/13/88	:10/25/88	10/26/88

OFFICIAL RECORD COPY

cc:
General Counsel
Tennessee Valley Authority
400 West Summit Hill Drive
E11 B33
Knoxville, Tennessee 37902

Mr. R. L. Gridley
Tennessee Valley Authority
5N 157B Lookout Place
Chattanooga, Tennessee 37402-2801

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

Mr. M. Ray
Tennessee Valley Authority
Sequoyah Nuclear Plant
P.O. Box 2000
Soddy Daisy, Tennessee 37379

Mr. D. L. Williams
Tennessee Valley Authority
400 West Summit Hill Drive
W10 B85
Knoxville, Tennessee 37902

County Judge
Hamilton County Courthouse
Chattanooga, Tennessee 37402

Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
101 Marietta Street, N.W.
Atlanta, Georgia 30323

Resident Inspector/Sequoyah NP
c/o U.S. Nuclear Regulatory Commission
2600 Igou Ferry Road
Soddy Daisy, Tennessee 37379

Mr. Michael H. Mobley, Director
Division of Radiological Health
T.E.R.R.A. Building, 6th Floor
150 9th Avenue North
Nashville, Tennessee 37219-5404

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

Tennessee Valley Authority
Rockville Office
11921 Rockville Pike
Suite 402
Rockville, Maryland 20852

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
TENNESSEE VALLEY AUTHORITY	)	Docket No. 50-327
	)	
Sequoyah Nuclear Plant, Unit 1	)	

EXEMPTION

I.

The Tennessee Valley Authority (the licensee) holds Facility Operating License No. DPR 77, which authorizes operation of the Sequoyah Nuclear Plant, Unit 1 (the facility, Unit 1). The license provides, among other things, that the facility is subject to all rules, regulations, and orders of the Nuclear Regulatory Commission (the Commission) now or hereafter in effect.

The facility is a pressurized water reactor located on the licensee's site in Hamilton County, Tennessee.

II.

Section 50.46(a)(1) to 10 CFR Part 50 requires, in part, that for a pressurized light-water reactor, its ECCS cooling performance shall be calculated in accordance with an acceptable evaluation model and plant operating conditions. Furthermore, Section 50.46(b)(1) to 10 CFR Part 50 requires that the calculated maximum fuel element cladding temperature or peak clad temperature (PCT) shall not exceed 2200°F.

By letter dated September 19, 1988 the licensee requested a temporary exemption from the requirement of 10 CFR 50.46(a)(1) until the ECCS cooling performance calculations for Unit 1 are completed. The ECCS cooling performance calculations will be performed using plant specific operating conditions with

an approved ECCS evaluation model. By letter dated September 21, 1988, the licensee has informed the Commission that the existing ECCS cooling performance calculations for the Upper Head Injection (UHI) calculation model for Unit 1, as discussed in Section 15.4 of the Final Safety Analysis Report (FSAR), are no longer representative of the operating conditions for the facility. The licensee also stated that for upcoming cycle 4 operation, there are changes needed for the UHI model. The licensee also provided an assessment demonstrating the safe operation of Unit 1 under the conditions discussed below.

The large break Loss-of-Coolant Accident (LOCA) ECCS analysis for Unit 1, as documented in FSAR Section 15.4.1, was performed with the Westinghouse 1974 Evaluation Model. It resulted in a PCT of 2113°F. This analysis was based on a heat flux hot channel factor, (Fq), of 2.32, a discharge coefficient, (Cd), of 0.6, and a lower bounding value of UHI water volume delivery of 900 cubic feet (ft^3).

A TVA Condition Adverse to Quality Report identified that the current level switches used in the UHI system potentially may allow more water to be injected during a postulated accident than the analytical limit of 1,130.5 ft^3. The over injection of water can result in the accidental injection of nitrogen into the reactor coolant system. Nitrogen in the reactor coolant system could result in the restriction of heat removal from the fuel cladding. TVA implemented two corrective actions to resolve the above mentioned CAQR. Specifically, the first is a proposed actual reduction in the total amount of water injected by the UHI system from the current minimum requirement of 900 ft^3 to 850 ft^3, thereby, decreasing the probability of over injecting water from the UHI system.

The reduction of the lower bounding value for UHI water volume delivery changes some of the original assumptions of the ECCS analysis. The second CAQR corrective action is the replacement of the level switches with modified switches whose characteristics present less instrument setpoint drift.

10 CFR 50.46(a)(1) requires an acceptable ECCS cooling analysis for calculating the expected PCT for operation of Unit 1. Changing the amount of water injected from the UHI system impacts the PCT analysis; therefore, a re-analysis of the PCT using an approved ECCS cooling performance evaluation model is required. Since Westinghouse, the Nuclear Steam Supply System supplier, is presently modifying the computer codes used to perform the analysis, an acceptable ECCS analysis to account for changing the lower bounding value for UHI water volume delivery, cannot be submitted before the current schedule for the restart of Unit 1. Thus, despite the licensee good faith efforts, it cannot at this time satisfy the requirements to submit a calculation in conformance with 10 CFR 50.46(a). Because of this delay, the licensee has requested a temporary exemption to 10 CFR 50.46(a)(1).

The licensee has performed a sensitivity assessment of the impact of delivering 50 ft^3 less of UHI water for the existing analysis to demonstrate that the PCT would remain below the regulatory limit of 2200°F. This assessment was provided to the Commission by submittals dated August 15 and 17, 1988. The submittal dated August 17, 1988 is a duplicate of the submittal dated August 15, 1988. These submittals requested a change in Unit 1 Technical Specifications (TS) on the UHI accumulators level switch setpoints. This requested TS change for Unit 1 is the proposed reduction in the total amount of water injected by the UHI system discussed above. The sensitivity assessment of delivering 50 ft^3 less UHI water was submitted originally to support the requested TS change.

The calculations showed that the new PCT was 2,198°F. To provide assurance that Unit 1 is below the PCT limit of 2200°F, the licensee has limited the heat flux hot channel factor, Fq, by administrative control, to a value of 2.15, and lowered the steam generator tube plugging limit from 10 to 5 percent. The licensee has stated that these two changes result in lowering the PCT to 109°F below the limit of 2200°F. The licensee has proposed a reduction in the current Fq cooling in the Unit 1 Technical Specifications from 2.237 to 2.15 by submittal dated September 21, 1988.

Based on the above discussion, and the licensee's assessment of the impact on the calculated PCT with 5 percent steam generator tube plugging and the reduction of Fq to a value of 2.15, the staff finds that a temporary exemption is warranted. This is a one-time temporary exemption from the requirement of 10 CFR 50.46(a)(1) regarding having a calculated plant specific ECCS cooling performance evaluation using plant operating conditions and an acceptable evaluation model. The staff also finds acceptable the schedule proposed by the licensee in their September 19, 1988 letter to have completed and submitted the re-analysis to the staff no later than May 31, 1989.

III.

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12, this 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)(v), are present justifying the exemption, namely that this exemption provides only temporary relief from the application of the regulation and that the licensee has made good faith efforts to comply with the regulation. The application of the regulation is not necessary during

this temporary period to assure the integrity of the fuel cladding in the event of a postulated design basis LOCA. Based on the discussion above and on its experience with similarly designed and operated four-loop Westinghouse plants, the staff concludes that requiring the delay of startup of the facility solely to perform a re-analysis confirming the submitted assessment for Unit 1 is not necessary for this temporary period.

Accordingly, the Commission hereby grants a temporary exemption from 10 CFR 50.46(a)(1) as described above, provided:

1. Heat flux hot channel factor, Fq, shall not exceed 2.15.
2. Steam Generator Tube Plugging shall not exceed five percent.
3. The licensee shall complete a revised plant specific ECCS analysis for Unit 1 and shall submit the results of such analysis no later than May 31, 1989.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this Exemption will have no significant impact on the environment.

For further details with respect to this action, see the request for exemption dated July 11, 1988, superseded by letter dated August 8, 1988, which is available for public inspection at the Commission's Public Document Room, Gelman Building, 2120 L Street, N.W., Washington, D.C., and at the Chattanooga-Hamilton County Library, 1001 Broad Street, Chattanooga, Tennessee 37402.

October 28, 1988

Distribution
Docket File
Projects Reading

DOCKET NO. 50-327~~XXXX~~

MEMORANDUM FOR: Rules and Procedures Branch
Division of Rules and Records
Office of Administration and Resources Management

FROM: Office of Nuclear Reactor Regulation

SUBJECT: TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT, UNIT 1

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.
- [ ] 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.
- [X] Exemption.
- [ ] Notice of Granting Exemption.
- [ ] Environmental Assessment.
- [ ] Notice of Preparation of Environmental Assessment.
- [ ] Other: _____

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

Enclosure:
As stated

Contact: A. Sanders
Phone: 49-20795

OFFICE ▶	OSP:TVA						
SURNAME ▶	ASanders						
DATE ▶	10/ /88						

NRC FORM 318 (10/80) NRCM 0240

OFFICIAL RECORD COPY