



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D. C. 20555-0001

ENCLOSURE 3

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 170 TO FACILITY OPERATING LICENSE NO. DPR-79

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT, UNIT 2

DOCKET NO. 50-328

1.0 INTRODUCTION

By application dated February 8, 1994, the Tennessee Valley Authority (TVA or the licensee) proposed an amendment to the Operating License for Sequoyah Nuclear Plant (SQN) Unit 2. The requested changes would revise Operating License Condition 2.C.(17) to provide a one-time, limited extension of the performance interval for certain specified surveillance tests on Unit 2 to coincide with the Cycle 6 refueling outage. The surveillance tests that are affected are instrumentation tests that are presently required to be performed at 18-month and 3-year intervals, and are listed herein. The proposed revised intervals will not exceed 28 months for the surveillance tests required every 18-months and 45 months for the Containment fire hose service hydrostatic test that is required every 45 months per Technical Specification (TS) 4.7.11.4.c.2.

A similar change to the SQN Operating License was approved by the Commission and issued by letter dated November 9, 1993 (with correction letter dated November 17, 1993), as Amendment No. 162. This change added License Condition 2.C.(17) and reflected extension of the surveillance intervals for certain specified instruments due to the refueling outage that was scheduled to start in April 1994. The only change to the list of instruments contained in that amendment and this proposed amendment is the addition of the Containment fire hose service hydrostatic test and deletion of the test specified in TS 4.4.3.2.1.b, Operation Through One Complete Cycle of Power Operated Relief Valves in Mode 4, which has been performed recently.

2.0 DISCUSSION

As originally scheduled, the present operating cycle for Unit 2 started on May 15, 1992, and would end 18 months later with the start of the Cycle 6 refueling outage. Therefore, all instruments that are on a required testing frequency of 18 months, would be performed before November 15, 1993. However, Unit 2 entered a forced outage on March 1, 1993, that lasted approximately 8 months, and has experienced several forced shutdowns following startup. In order to regain the usable fuel resulting from the shutdowns to optimize fuel burnup, the licensee is planning to extend the present operating cycle for Unit 2 and start the Cycle 6 refueling outage on July 3, 1994. This revised

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the 25 percent maximum extension allowed by TS 4.0.2) being exceeded prior to the outage.

The surveillance tests for which an extension is requested cannot be performed during power operation without risking a unit transient or undesirable radiation exposure to personnel. Without the extensions, either a plant shutdown on or before April 15, 1994 (the date allowed in Amendment No. 162), would be necessary or testing would have to be performed at power.

Normally the proposed extension period would end on the new date that the unit is actually shut down to begin the refueling outage (July 3, 1994). However, to arrive at the final proposed date that would include all tests in the proposed extension, an additional 2-week extension past the start of the refueling outage (to July 15, 1994) is needed in order to maintain TS-compliance of the low-temperature overpressure protection instrumentation. These instruments must remain in the operable status in Modes 4, 5 and 6 when the reactor vessel head is in place.

The licensee has requested extension of the following Surveillance Requirements:

<u>TECHNICAL SPECIFICATION SECTION</u>	<u>DESCRIPTION</u>	<u>18-MONTH PLUS 25% ALLOWANCE EXPIRATION DATE</u>
4.1.2.2.c	Boron Injection Flow Path Automatic Valve Actuation on Safety Injection Signal	2/14/94
4.1.3.4	Rod-Drop Timing Measurement	3/31/94
4.2.5.3	Channel Calibration of Reactor Coolant System Flow Instrumentation	2/23/94
4.3.1.1.1 Items 2,3,4,7, 8,9,10,11,12, 13,14,17,22	Channel Calibration of Reactor Trip System Instrumentation	2/3/94
4.3.1.1.2	Reactor Trip System Instrumentation Interlocks	2/3/94
4.3.1.1.3 Items 7,8, 9,10,12,13	Response Time of Reactor Trip System Instrumentation	2/9/94
4.3.2.1.1 Items 1,2,3, 4,5,6,7,8,9	Engineered Safety Feature Actuation System Instrumentation Channel Calibrations	1/30/94

4.3.2.1.2	Engineered Safety Feature Actuation System Instrumentation Interlocks	2/9/94
4.3.2.1.3 Items 2,3,5, 6,7,8,9,10, 11,12,13	Engineered Safety Feature Actuation System Instrumentation Response Time Measurement	1/31/94
4.3.3.5 Items 3,4, 5,6,7,9,11, 12,13	Channel Calibration of Remote Shutdown Instrumentation	2/1/94
4.3.3.7.b	Channel Calibration of Accident Monitoring Instrumentation	2/1/94
4.4.3.2.1.a	Channel Calibration of Power Operated Relief Valves	2/9/94
4.4.12.1.b	Channel Calibration of Low-Temperature Overpressure Protection System	2/8/94
4.5.1.1.2.b	Channel Calibration of Cold Leg Injection Accumulator Pressure and Level Instrumentation	2/18/94
4.5.2.e.1 and 4.5.3	Emergency Core Cooling System Flow Path Automatic Valve Actuation on Safety Injection Signal	2/14/94
4.6.3.2.e	Normal Charging Isolation Valve Actuation on Safety Injection Signal	2/14/94
4.6.4.3.b	Temperature Verification of Hydrogen Mitigation System Igniters	2/17/94
4.8.3.1.a.2	Lower-Voltage Circuit Breaker Test for Containment Penetration Conductor Overcurrent Protection Devices	2/1/94
4.8.3.3.a	Non-1E Load Circuit Breaker Test for Isolation Devices	2/3/94

The surveillance interval extensions requested for these instruments is between 3.5 and 5.5 months (depending on the actual date the test was last performed) above the maximum extension allowed by the TS. All tests will be performed during the Cycle 6 refueling outage.

In its application for the amendment, TVA concluded that the reliability defined by the normal surveillance intervals will not be significantly reduced by the extension. This conclusion is based on the following considerations for extending surveillances that primarily involve instrumentation components.

1. Instrument accuracy calculations are based on the random nature of time-based drift. Redundant channels are not expected to drift an equal amount in the same direction. Therefore, differences between channel readings should provide a means of detecting drift of a channel.
2. Until testing is performed at the next refueling outage, current monitoring of instrumentation and ongoing TS surveillance tests provide assurance that the equipment involved in the extended surveillance tests will remain in an operable condition.
3. Periodic surveillance tests have been performed since the last refueling outage to monitor system and component performance and to detect any significant degradation. Surveillance testing will continue to be performed during the requested extension interval that provides added assurance that the reliability of equipment associated with the extended surveillance will not be significantly degraded by this one-time extension.
4. Historically, the electronic components in the reactor protection system and engineered safety features actuation system have shown a very high degree of reliability. This reliability is further enhanced by the online diagnostics and self-calibration routine provided by the Eagle-21 protection sets installed at Sequoyah.
5. Redundant instrumentation loops are available and indicate in the main control room. Redundant Class 1E qualified continuous control room indication is provided for all Category 1 post-accident monitoring channels. Redundant channels are not expected to drift in the same direction and with the same magnitude.
6. The Eagle-21 Reactor Protection System is designed to use inputs from three or four instrumentation channels and outputs to two trip-logic trains for each protective function. These redundant channels and trains are electrically isolated and physically separated. Thus, any single failure within a channel or train will not prevent a required protective system action.
7. Based on field experience, a review of the Unit 2 demonstrated accuracy calculations for the safety-related channels, and evaluation of drift data, TVA concluded that the additional expected drift would not result in unacceptable instrumentation performance for the extension period requested.

TVA also supplied additional discussions related to the following specific instrument tests:

Rod-Drop Timing Measurements

Hydrogen Mitigation System Igniter Temperature

Lower-Voltage Circuit Breaker Test

Non-1E Load Circuit Breaker Test

Boron Injection, Emergency Core Cooling System, and Normal Charging Flow Path Automatic Valve Actuation on Safety Injection Signal

In addition, TVA has requested that the interval for the 3-year surveillance test required by TS 4.7.11.4.c.2, Fire Hose Service Hydrostatic Test in Containment, be extended by 1 month. The interval for this test plus the 25 percent allowance expires on June 23, 1994. The surveillance involves hydrostatic testing of fire hoses located at six hose stations inside the reactor building crane wall. Testing of these hoses would result in significant radiation exposure to the test personnel. This test was last performed by installing new hoses in each station that had been tested by the manufacturer. This provides additional assurance that the hoses will function if they are needed.

3.0 EVALUATION

The Unit 2 forced shutdown that started on March 1, 1993, has lasted approximately 8 months. In order to obtain optimum fuel burnup by recovering some of this core operating time, the licensee has moved the refueling outage previously scheduled to begin in September 1993 to April 1994 and then to July 1994. The impact of this rescheduling is that certain surveillance tests that are performed during a refueling outage will fall due (including the extensions permitted by TS 4.0.2) before the start of the outage, unless the surveillance intervals are extended.

Periodic surveillance requirements were not intended to adversely affect safe plant operation simply because a specified surveillance interval does not coincide with plant operating schedules. Normally, variations in schedules can be accommodated through the existing technical specifications. Specifically, TS 4.0.2 is an administrative control that ensures surveillance tests are performed within the specified interval and provides for an allowable tolerance (25 percent) for performing surveillances beyond the normal surveillance interval. This tolerance provides operational flexibility to allow for scheduling and performance considerations while still ensuring that the reliability of the equipment or system associated with the surveillance is not significantly degraded beyond that obtained from the nominal specified surveillance interval. However, circumstances can develop wherein the relief provided by TS 4.0.2 is inadequate, but good cause for additional relief can be demonstrated by the licensee.

Such is the case here. TVA has provided compelling evidence that the change in the refueling schedule was not undertaken for a reason or in a manner adverse to safety, that reasonable assurance exists that equipment associated with the subject surveillances will not be degraded significantly by the requested interval extensions, and that good cause exists for granting the extensions. The surveillance interval extensions proposed by TVA would result in a slightly diminished confidence in the reliability that would be provided by TS 4.0.2, but TVA has satisfactorily addressed this concern.

The proposed license condition would extend the allowable surveillance intervals for certain specified instruments from 22.5 months (nominal 18 months plus 4.5 months allowable extension per TS 4.0.2) to a maximum of 28 months. It would also extend the surveillance interval for the Containment fire hose hydrostatic pressure test from 45 months (nominal 36 months plus 9 months allowable extension per TS 4.0.2) to a maximum of 46 months. The staff believes that the additional extensions are not significant for the particular tests listed herein. Therefore, the staff finds the proposed license condition acceptable.

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 surveillance requirements. 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 amendments involve no significant hazards consideration, and there has been no public comment on such finding (59 FR 10015). 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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

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Dated: March 31, 1994