

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401  
400 Chestnut Street Tower II

December 28, 1982

Director of Nuclear Reactor Regulation  
Attention: Ms. E. Adensam, Chief  
Licensing Branch No. 4  
Division of Licensing  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Ms. Adensam:

In the Matter of ) Docket No. 50-327  
Tennessee Valley Authority ) 50-328

As stated in the Safety Evaluation Report to Amendment 5 of the Sequoyah Nuclear Plant Operating License, DPR-77, TVA agreed to provide a report on the operating experience, as related to purge/vent system operation, no later than startup after the first refueling outage. Enclosed is the report on the operation of the containment purge and venting systems for Sequoyah Nuclear Plant unit 1 for March and April of 1982.

If you have any questions concerning this matter, please get in touch with J. E. Wills at FTS 858-2683.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

*L. M. Mills*  
L. M. Mills, Manager  
Nuclear Licensing

Sworn to and subscribed before me  
this 28<sup>th</sup> day of Dec. 1982

*Paulette H. White*  
Notary Public  
My Commission Expires 9-5-84

Enclosure

cc: U.S. Nuclear Regulatory Commission (Enclosure)  
Region II  
Attn: Mr. James P. O'Reilly Administrator  
101 Marietta Street, Suite 3100  
Atlanta, Georgia 30303

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ENCLOSURE

SEQUOYAH NUCLEAR PLANT (SQN)  
CONTAINMENT PURGE STUDY

Introduction

The operation of the containment purge and venting systems at SQN units 1 and 2 is limited by plant technical specifications to 1,000 hours per year per unit during modes 1, 2, 3, and 4 using one pair (one purge supply line and one purge exhaust line) of containment purge system lines. The following is a discussion of the surveillance program conducted to ensure the operability of the purge system as well as a discussion of the time required for purging and venting to date and the reasons for purging and venting.

Surveillance Program

The Sequoyah purge system utilizes two pairs of 14,000 cfm supply and exhaust fans along with smaller, approximately 800 cfm, supply and exhaust fans for the incore instrument room. All air discharged by this system is filtered before release through a set of filter banks comprised of prefilters, high efficiency particulate filters, and charcoal filters. These filter banks are tested every 12 months in accordance with ANSI N510-1975 and verified to remove greater than or equal to 99 percent of particulate and halogenated hydrocarbon test gas.

Each of the ten purge system line penetrations through the containment vessel has inboard and outboard isolation valves that are periodically tested for leakage and closure time. The surveillance program requires the isolation valve(s) to be leak tested following each cycling of the valve(s) or every 90 days. The valves are tested for closure time following any maintenance on the valves or every 90 days. The performance of the Sequoyah purge isolation valves has to date been excellent with average closure times well below the required four seconds and leak rates well below the limits specified in the plant technical specifications. In addition, testing of the bypass, override, and reset circuits of all systems receiving engineered safety feature (ESF) signals, including the containment purge system, has been completed at Sequoyah. These tests verified that safety feature actuation signals cannot be inadvertently blocked, overridden, or bypassed, and also verified that safety-related equipment would not return to its nonsafety mode upon reset of the ESF signal.

Containment Venting Requirements

Sequoyah technical specifications require that primary containment internal pressure be maintained between -0.1 and 0.3 psig relative to the annulus pressure and that primary containment internal pressure be determined to be within these limits at least once per 12 hours. The need to vent primary containment to maintain the limits given above results from the slow increase in containment pressure due to the control air bleedoff from the many air-operated valves inside containment and the changes in annulus pressure due to changes in environmental temperature and barometric pressure throughout the day.

Table 1 provides a listing of the venting time required for Sequoyah unit 1 for the 31-day period from March 17, 1982, through April 16, 1982. As indicated in this table, Sequoyah unit 1 is required to vent to release containment pressure an average of 1.69 hours/day in order to meet technical specification limits. Based on this data, Sequoyah unit 1 will require 617 hours of vent time each year.

#### Containment Purging Requirements

Containment purging is required to reduce the activity levels inside containment and thereby reduce dose to personnel required to enter containment during operation. Ice condenser containments, such as those found at Sequoyah, require significantly more containment entries than other types of containments. This is due to both additional surveillance required by technical specifications and additional inspection and maintenance of the ice condenser systems.

For example, a routine walk-through inspection of the ice condenser is performed three times daily (once per shift). This walk-through inspection requires entry into containment and entry into the ice condenser itself. Since the ice condenser is a closed system with only inleakage from the containment as a source of air, a buildup of airborne activity in the ice condenser is extremely difficult to reduce even though the purge system may reduce the levels in containment relatively fast. It is therefore necessary to keep activity levels in the containment as low as possible to prevent any excessive buildup in the ice condenser. Use of air packs during ice condenser inspections is prohibited due to the increased probability of injury to personnel as a result of the face plate fogging. It should also be noted that use of an air pack impairs an individual's ability to reach the location of certain pieces of equipment as well as his ability to remain in containment for an extended period of time. Table 2 provides a general breakdown of the 1,313 containment entries made in modes 1, 2, 3, and 4 from March 5, 1982, through April 22, 1982.

Table 3 provides a listing of the purging time required for Sequoyah unit 1 for a 32-day period from March 17, 1982, through April 17, 1982, in order to keep containment activity levels below that which would prevent inspection and maintenance. Based on the data in this table, Sequoyah unit 1 is required to purge an average of 3.69 hours per day to comply with our (TVA) ALARA approach toward occupational exposure; therefore, Sequoyah unit 1 (using a single pair of lines) will require 1,347 hours per year to meet its purge requirements.

#### Summary

TVA has self-imposed limits on occupational exposure which are below those set forth in Federal standards. We have in the past and will continue to follow the ALARA approach toward occupational exposure both in the design and operation of our nuclear plants. In order to achieve our goal of low occupational exposure, Sequoyah will require, as indicated in the above discussion, approximately 1,964 hours total purge time per year (1,347

purging, 617 venting) or 5.34 hours per day. The present technical specification limit of 1,000 hours will limit the time Sequoyah can operate in modes 1, 2, 3, and 4 to approximately six months per year.

It is our belief that, given our strict and comprehensive surveillance program and the performance of our system to date, extending the purge and vent capability at Sequoyah will not significantly increase the probability of an offsite release in excess of 10 CFR 100 guidelines.

TABLE 1  
VENTING TIME  
MARCH 17, 1982 THROUGH APRIL 17, 1982

<u>Date</u>	<u>Time Venting Initiated</u>	<u>Hours Open</u>
3/18	1133	0.75
	1750	0.83
3/19	0227	0.30
	0535	0.50
	1100	0.67
	1825	0.50
3/20	0305	1.00
3/21	0200	1.25
	1745	1.00
3/22	0900	1.00
	1608	0.97
3/23	0504	1.00
	1415	0.83
3/24	0055	0.70
	0925	0.50
3/25	0910	0.50
	1210	0.50
3/26	0158	0.75
	0923	0.33
	1910	0.67
3/28	0612	0.50
	1240	0.67
	2210	0.50
3/29	0645	0.75
	1615	0.75
3/30	0040	1.00
	0859	0.97
3/31	0000	0.75
	1042	0.83
	2350	0.50
4/1	0920	0.73
	1507	1.00

TABLE 1 (cont'd)

<u>Date</u>	<u>Time Venting Initiated</u>	<u>Hours Open</u>
4/2	1223	1.00
	2255	1.00
4/3	0727	1.68
4/4	0025	0.75
	1057	0.83
	1742	1.00
4/5	0622	0.75
	1233	1.02
	1810	0.50
4/6	1223	0.78
	1555	0.42
	1850	0.67
4/7	0250	0.50
	0810	0.33
4/8	0906	1.13
	1815	1.00
4/9	0205	0.75
	1212	0.77
	2205	0.58
4/10	0634	0.68
	1414	0.90
4/11	1251	0.47
	1733	1.00
4/12	0310	0.50
	1110	0.50
	1422	0.50
	1900	0.50
4/13	0400	0.50
	1300	0.50
4/14	0845	0.50
	1325	0.50
	2030	0.50
4/15	0120	0.50
	1000	0.50
	1400	1.00

TABLE 1 (cont'd)

<u>Date</u>	<u>Time Venting Initiated</u>	<u>Hours Open</u>
4/16	0030	0.50
	0835	0.50
	1458	1.00
4/17	0130	0.42
	0912	0.50
	1710	1.00
	TOTAL	52.43
	AVERAGE	1.69 hrs/day

TABLE 2

CONTAINMENT ENTRIES MODES 1 THROUGH 4  
MARCH 5, 1982 THROUGH APRIL 22, 1982

<u>Number of Entries</u>	<u>Reason</u>
379	Maintenance
314	Health Physics Inspection
196	Surveillance Requirements
155	Quality Assurance
144	Office of Power Stores
78	Instrument Maintenance
17	Janitors
4	Security
26	Others

TABLE 3  
PURGING TIME  
MARCH 17, 1982 THROUGH APRIL 17, 1982

<u>Date</u>	<u>Time Initiated</u>	<u>Hours Open</u>	<u>Compartment</u>
3/17	1003	4.33	
	1705	11.67	
3/20	1105	2.12	
	1338	2.52	
	1800	2.17	
	2015	1.17	
3/24	1130	5.00	
	1755	4.00	
3/27	0210	7.33	
	0952	6.18	
3/30	1100	6.50	
	1730	4.00	
4/2	0010	4.33	
	1335	5.00	
4/6	0005	4.67	
	0716	3.23	
	1434	0.67	
	1650	0.17	
4/7	1050	2.92	
	1610	7.50	
4/8	0005	4.66	
4/10	1900	5.00	
4/11	0000	1.08	
	0105	5.33	
	0658	3.13	
4/13	1345	4.00	
	1900	6.00	
4/14	0300	2.50	
4/17	2300	1.00	
	TOTAL	118.18	
	AVERAGE	3.69 hours/day	