



Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37384-2000

December 17, 2004

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

Gentlemen:

In the Matter of	)	Docket Nos. 50-327
Tennessee Valley Authority	)	50-328

**SEQUOYAH NUCLEAR PLANT (SQN) - TRANSMITTAL OF REVISION 1  
SIGNIFICANCE DETERMINATION PROCESS (SDP) RISK-INFORMED  
INSPECTION NOTEBOOK AND INFORMATION REQUEST FOR NEXT  
REVISION**

The purpose of this letter is to provide a response to an NRC letter from Mr. Michael Tschiltz to TVA's Mr. Chris Carey dated September 10, 2004. NRC requested specific plant information for SQN be provided by compact disk (CD) within 30 days of the receipt of their request. The plant-specific information is included within the enclosed CD. In accordance with RIN 3150-AH33, "Electronic Maintenance and Submission of Information," Enclosure 1 provides the details of the CD's content. Enclosure 2 provides SQN's response to NRC's request structured with the enclosed CD.

NRC contacted TVA subsequent to sending the information request to ensure it had been received. At that time, NRC requested the SQN response be docketed and agreed to extend the 30-day response time.

In accordance with the NRC letter, the enclosed information is considered "Proprietary Information." Therefore, TVA requests that the enclosed information be withheld from public disclosure in accordance with 10 CFR 2.390(d).

This letter contains no regulatory commitments.

APOI

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Please direct questions concerning this issue to me at  
(423) 843-7170 or J. D. Smith at (423) 843-6672.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. L. Pace', followed by the word 'for' written in a cursive script.

P. L. Pace  
Manager, Site Licensing  
and Industry Affairs

Enclosures

cc: (Enclosures)

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ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY (TVA)  
SEQUOYAH NUCLEAR PLANT (SQN)  
UNITS 1 AND 2

SEQUOYAH NUCLEAR PLANT (SQN) - TRANSMITTAL OF REVISION 1  
SIGNIFICANCE DETERMINATION PROCESS (SDP) RISK-INFORMED INSPECTION  
NOTEBOOK AND INFORMATION REQUEST FOR NEXT REVISION

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Enclosed compact Disc Content

FILE NAME	FILE SIZE - KB
001_B1 - Case 1 BEI.xls .PDF	182
002_B1 - Case 2 BEI.xls	198
003_B1 - BE Decoder.xls	206
004_B2 - 100SEQ.xls	39
005_B2 and B7 - Sequence Decoder.pdf	57
006_B3 IEF and B4 CDF.xls	28
007_B5 - Frontline Event Trees.pdf	39
008_B5 - Special Event Trees.pdf	29
009_B5 - Support System Event Trees.pdf	22
010_B6 - R3 Changes to Model.pdf	126
011_B7 - 25 seq for each initiator.xls	314
012_B8 - System Dependency Tables.pdf	86
013_B9 - System Notebooks.pdf	5
014_C10 -HRA Values.pdf	33
015_C11 - ERCW.pdf	5
016_C11 - AOP-M01.pdf	432
017_C12 - RCP Seals.pdf	15
018_C13 - SGTR HRA.pdf	47
019_C14-16 LERF.pdf	37
020_C17 - HRA HAHH1.pdf	6
021_D - Table 1.pdf	16

ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY (TVA)  
SEQUOYAH NUCLEAR PLANT (SQN)  
UNITS 1 AND 2

SEQUOYAH NUCLEAR PLANT (SQN) - TRANSMITTAL OF REVISION 1  
SIGNIFICANCE DETERMINATION PROCESS (SDP) RISK-INFORMED INSPECTION  
NOTEBOOK AND INFORMATION REQUEST FOR NEXT REVISION

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NRC REQUEST

A. Comments on Rev. 1 Version of the Notebook

Please provide any comments on the Rev. 1 version of the notebook for the Sequoyah Power Station. Comments on the Rev. 1 version of the notebook and the information requested below will be used to improve and prepare Rev. 2 version of the notebook.

SQN RESPONSE

SQN does not have any comments on the Rev. 1 version of the SDP notebook.

NRC REQUEST

B. Updated Plant PRA Information

Rev. 1 version of the notebook is based on the information collected during the site visit for benchmarking in January 2003. For the items marked (\*) below, please provide the information if they have been updated since the site visit in January 2003.

An electronic copy for the following is requested.

- (1) List of basic event RAW values (preferably in an Excel spreadsheet) for the following:

Case I: internal events and **no** internal flood and **no** ISLOCA.

Case II: Full model - all internal and external events (if available).

Please include a decoder/basic event description list so we can interpret the RAW list. Include, **average maintenance and test unavailabilities in the above cases.**

- (2) Top 100+ sequences

- \* (3) A list of the PRA's initiating event frequencies. For support systems based initiators (e.g., loss of CCW), please note if the frequency is based on a fault tree or generic data sources (e.g., NUREG/CR-5750).
- \* (4) CDF values:
  - (1) internal events CDF value (not including internal flood and no ISLOCA) & model truncation level(s).
  - (2) total CDF (complete model with external events).
  - (3) percentage breakdown of total CDF by initiator.
- \* (5) Copy of the event trees.
- (6) A PRA summary of major insights/recent changes to the model
- (7) Top 25 sequences for each initiator in the PRA model.
- \* (8) Updated equipment dependency matrix.
- (9) Copy of the system notebooks (optional)

#### SQN RESPONSE

The enclosed compact disc (CD) contains the response to the above requests as follows:

NRC Request	SQN Response File Name
1	001_B1-Case 1 BEI.xls 002_B1-Case 2 BEI.xls 003_B1-BE Decoder.xls
2	004_B2-100SEQ.xls 005_B2 and B7 - Sequence Decoder.pdf
3 and 4	006_B3 IEF and B4 CDF.xls
5	007_5 - Frontline Event Tree.pdf 008_5 - Special System Trees.pdf 009_5 - Support System Event Trees.pdf
6	010_B6 - R3 Changes to Model.pdf
7	011_B7 - 25 seq for each initiator.xls See SQN Response 2 for sequence decoder
8	012_B8 - System Dependency Table.pdf

NRC Request	SQN Response File Name
9	013_B9 - System Notebooks.pdf

#### NRC REQUEST

#### **C. Plant-Specific Questions**

- (10) For operator actions credited in the SDP notebook, please provide revised operator action/human error probabilities (HEPs).
- (11) In loss of a train of ERCW (e.g., ERCW train A), 2/4 pumps in train B is required to operate. One pump is normally running, how does the other pump start? Please describe the action, the time it takes, and provide the emergency procedure for response to loss of a train of ERCW.
- (12) Please provide a summary of the PRA models for RCP seal failures and seal leakage. Please discuss the credit provided for RCS cooldown and depressurization in reducing the seal leakage.
- (13) Please describe the scenarios of accidents during SGTR. Please describe the important operator actions such as SG isolation and equalization. If possible, please provide the plant procedure for SGTR.

#### SQN RESPONSE

The enclosed CD contains the response to the above requests as follows:

NRC Request	SQN Response File Name
10	014_C10 - HRA Values.pdf
11	015_C11 - ERCW.pdf 016_C11 - AOP-M01.pdf
12	017_C12 - RCP Seals.pdf
13	018_C13 - SGTR HRA.pdf

#### NRC REQUEST

#### **C.1 LERF**

- (14) Hydrogen Ignition System: For the HIS, please provide the maintenance rule performance criteria. How many ignitors (coils) and associated voltage regulators (if installed) have failed in the previous 2 years?

- (15) For the Tayco ignitors and associated voltage regulators, what failure probabilities or hazard rate, common cause factors, and success criteria are used in the PRA if modeled?
- (16) Are the ignitors periodically replaced as part of a life-cycle management or for environmental qualification purposes. If so, how often are they replaced?
- (17) Please provide the HRA evaluation for modeled operator actions related to hydrogen mitigation.

#### SQN RESPONSE

The enclosed CD contains the response to the above requests as follows:

NRC Request	SQN Response File Name
14, 15, and 16	019_C14-16 LERF.pdf
17	020_C17 HRA HAHH1.pdf

#### NRC REQUEST

##### **D. Benchmarking Data**

The following table is a modified version of the table prepared as part of benchmarking of the Rev. 1 notebook. The intent here is to update the RAW values for the listed components and failed operator actions. Please note that some additional cases may have been added since the benchmarking in January 2003.

1. Please provide the internal RAW value and the corresponding basic event name based on the latest version of the PRA. RAW values to be used in this table are based on internal event CDF model excluding internal flooding and ISLOCA (average maintenance and test unavailability case).
2. For clarification of items in the table (components and operator actions), please refer to the SDP notebook. If a comparable RAW value cannot be obtained for an item, please so indicate and provide additional comments as necessary in the comments column (e.g., event listed is not modeled or the event listed is modeled by one or more different events in the PRA).

3. For those items where the RAW values include the initiating event contribution, please so indicate in the comments column. The initiating frequency of support system based initiators (e.g., loss of CCW or loss of a DC Bus) may be modeled using fault trees. RAW values for items relating to these systems can have contribution due to impact on initiating event frequency.



Table 1: Summary of Benchmarking Results for Sequoyah

No.	Component Out-of-Service or Failed Operator Action	Basic Event Name	RAW Values From Rev. 1 Notebook	Updated RAW Values	Comments
	Component				
1	One accumulator fails		1.22		
2	One MDP of AFW fails (MDAFWP-A)		1.36		
3	TDP of AFW fails		2.37		
4	Both MDAFW pumps fail (CCF)		53.99		
5	TDAFW trip and throttle valve FTO (FCV 1-51)		1.55		
6	CVCS centrifugal charging pump A fails to run		2.25		
7	CVCS centrifugal charging pump B fails to run		2.38		
8	MOV FCV 63-25 FTO CCP discharge to cold leg		1.008		
9	HHSI pump A FTS		1.00		
10	One RHR pump fails (A)		4.00		
11	One RHR pump fails (B)		5.87		
12	Containment spray pump A or B FTS		1.00		

No.	Component Out-of-Service or Failed Operator Action	Basic Event Name	RAW Values From Rev. 1 Notebook	Updated RAW Values	Comments
13	Containment recirculation sump valve FCV 63-73 (Train B) FTO		5.58		
14	ECCS LPI/HPI piggy back valve FCV 63-8 FTO		1.00		
15	Failure of RWST level to 4/4 Instruments				Delta CDF = 2.43E-03
16	Loss of Main Feedwater		1.11		
17	One SG PORV fails to open PCV 1-5		1.00		
18	One MSIV fails to close (FCV 1-22)		1.00		
19	One primary PORV fails to open PCV 68-334		1.195		
20	CCF of both PORVs FTO		2.14		
21	One primary PORV fails to close				
22	One primary block valve fails to close PCV 68-333		1.34		
23	One primary safety valve fails to open (68-563)		2.057		
24	RHR system fails drop line valve				
25	AMSAC fails		1.008		

No.	Component Out-of-Service or Failed Operator Action	Basic Event Name	RAW Values From Rev. 1 Notebook	Updated RAW Values	Comments
26	One air compressor of IA fails		1.00		
27	One CCS pump 1A-A FTR		2.1		
28	One Standby ERCW pump J-A FTS		1.0		
29	One running ERCW pump fails				
30	6.9KV AC bus 1A-A fails (safeguard)		641.5		
31	1H diesel generator fails		2.57		
32	EDG 1A-A FTR	without EDG recovery	3.488		
33	EDG 1A-A FTR	with EDG recovery	1.374		
34	EDG fuel oil transfer pump FTS		1.008		
35	One Vital 125 VDC bus 1-1 fails		50.00		
36	125 VDC vital battery fails		~1.0		
37	Failure of a battery charger				
	<b>Operator Actions</b>				
38	Operator fails to conduct Feed/Bleed		1.293		
39	Fail to conduct emergency boration		3.75		
40	Fail to initiate HPR		195.94		

No.	Component Out-of-Service or Failed Operator Action	Basic Event Name	RAW Values From Rev. 1 Notebook	Updated RAW Values	Comments
41	Fail to refill RWST during SGTR		1.846		
42	Fail to depressurize RCS in SLOCA when no HPI		1.00		
43	Fail to isolate faulted SG		6.02		
44	Fail to depressurize and cooldown RCS in SGTR		130.89		
45	Fail to restore main feedwater		1.114		
46	Manual local control of MDAFW flow during loss of IA				
47	Tripping RCPs after loss of cooling				

#### SQLN RESPONSE

The enclosed CD contains the response to the above requests in the file named 021\_D - Table 1.pdf.