

Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37379-2000

R.J. Adney  
Site Vice President  
Sequoyah Nuclear Plant

June 11, 1997

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

Gentlemen:

In the Matter of )  
Tennessee Valley Authority )

Docket Nos. 50-327  
50-328

SEQUOYAH NUCLEAR PLANT (SQN) - NRC INSPECTION REPORT NOS. 50-327,  
328/97-03 - REPLY TO NOTICE OF VIOLATION (NOV)

Enclosed is TVA's reply to Jon R. Johnson's letter to O. D. Kingsley, Jr., dated May 12, 1997. The NOV identified seven violations. The violations are characterized as: 1) failure to follow procedure for placement of a spent fuel pool cooling pump in service, 2) failure to follow the requirements of a work order during repair of electrical conductors, 3) failure to adequately perform surveillance testing on the reactor trip breakers, 4) failure to follow procedure in response to an identified off-normal condition associated with the turbine-driven auxiliary feedwater (TDAFW) condensate sump pumps, 5) failure to follow procedure before disablement of the alarm to the TDAFW condensate sump, 6) failure to take prompt corrective action for resolution of a condition adverse to quality relative to reconciliation of reactor core design changes, and 7) failure to maintain design control relative to radiation dose values contained in design basis calculations.

The violations cited are representative of performance problems at SQN which have been discussed with the staff in meetings on February 26, and May 14, 1997. As discussed in these meetings, actions for improving performance have been initiated. These actions include but are not limited to:

- Department manager and supervisor assessments
- Department performance self-assessments
- Enforcing personnel performance accountability
- Rotational assignments for knowledge and talent increase
- Use of performance appraisals to communicate expectations
- New experienced management recruits

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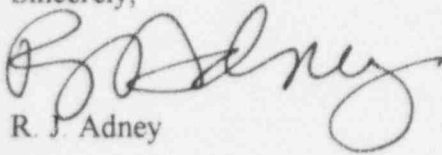
- Establishment of key focus areas:
  - Status control
  - Post Maintenance Testing (PMT) process
  - Surveillance program
  - Sensitive activities
  - Procedural adherence

TVA will continue to report on SQN's progress in completing these actions and the action results.

In TVA's reply to the NOV, TVA is denying Violation G (50-327, 328/97-03-09), failure to maintain design control relative to radiation dose values contained in design basis calculations. Enclosure 1 contains TVA's response to the NOV. Commitments associated with this submittal are included in Enclosure 2.

If you have questions regarding this response, please telephone me at (423) 843-7001.

Sincerely,



R. J. Adney

Enclosure  
cc (Enclosure):

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ENCLOSURE 1  
RESPONSE TO NRC NOTICE OF VIOLATION  
INSPECTION REPORT NOS. 50-327, 325/97-03  
JON R. JOHNSON'S LETTER TO OLIVER D. KINGSLEY, JR.  
DATED MAY 12, 1997

VIOLATION 50-327, 328/97-03

- "A. Technical Specifications 6.8.1.a requires, in part, that procedures shall be established, implemented, and maintained covering the activities recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978, "Quality Assurance Program Requirements (Operations)." Appendix A of Regulatory Guide 1.33, Section 4, includes procedures for startup and shutdown of the Fuel Storage Pool Purification and Cooling System.

System Operating Instruction (SOI)-78.1, Spent Fuel Pit Coolant System (SFPCS), Revision 53, provided instruction for placing in service the C-S SFPCS pump, including opening the pump discharge valve.

Contrary to the above, on March 24, 1997, the licensee failed to open the C-S SFPCS pump discharge valve when placing the C-S pump in service. The system, subsequently operated for about 2.5 hours with the discharge valve closed and cooling flow to the spent fuel pool isolated.

"This is a Severity Level IV Violation (Supplement 1)."

- "B. Technical Specifications 6.8.1.a requires, in part, that procedures shall be established, implemented, and maintained covering the activities recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978, "Quality Assurance Program Requirements (Operations)." Appendix A of Regulatory Guide 1.33, Section 9, requires procedures for maintenance that can affect the performance of safety-related equipment should be properly preplanned and performed in accordance with documented instructions.

Work Order 97-006117, was issued to provide instructions to repair electrical conductors which had been damaged during modification to a main control room hand switch. The Work Order required, as a prerequisite to the repair, that electrical breaker 1716 be verified open.

Contrary to the above, on April 4, 1997, Work Order 97-006117 was not followed in that the licensee did not ensure that electrical breaker 1716 was open prior to beginning repair of the damaged conductors. Consequently when repairs began, power was lost to the 1A-A Shutdown Board.

"This is a Severity Level IV Violation (Supplement 1), for Unit 1 only."

- "C. Unit 2 Technical Specification (TS) 4.3.1.1.2 requires that the total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation. This TS is applicable to components listed in Table 3.3-1, Reactor Trip System Instrumentation. Table 3.3-1, Functional Unit 22, Reactor Trip System Interlocks, Section "G", contains the Reactor Trip - P-4 function.

Contrary to the above:

1. On August 29, 1996, the Unit 2 "A" reactor trip breaker total interlock function was not demonstrated to be OPERABLE at least once per 18 months for the Table 3.3-1 Functional Unit 22.G, Reactor Trip - P-4 interlock, in that the "A" reactor trip breaker P-4 reactor trip-turbine trip interlock (breaker contactor) had not been tested since May 1994 as a "spare" and was installed as an OPERABLE component. The breaker was not adequately tested until January 18, 1997.
2. On August 29, 1996, for the "A" reactor trip breaker and on October 22, 1996, for the "B" reactor trip breaker, the total interlock function was not demonstrated to be OPERABLE at least once per 18 months for the Table 3.3-1 Functional Unit 22.G, Reactor Trip - P-4 interlock, in that following replacement of the in-service reactor trip breakers with spare/refurbished breakers, the reactor trip breaker auxiliary contacts to cubicle contacts were not checked to verify circuit continuity. This invalidated the previous 18 month TS 4.3.1.1.2 surveillance, which was last completed on May 31, 1996. The breakers were not adequately tested until January 18, 1997, for the "A" reactor trip breaker and on February 7, 1997, for the "B" reactor trip breaker.

"This is a Severity Level IV Violation (Supplement 1), for Unit 2 only."

- "D. Technical Specifications 6.8.1.a requires, in part, that procedures shall be established, implemented, and maintained covering the activities recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978, "Quality Assurance Program Requirements (Operations)." Appendix A of Regulatory Guide 1.33, Section 5, requires procedures for Abnormal, offnormal or Alarm conditions.

Site Standard Practice (SSP)-8.50, Conduct of Technical Support, Revision 10, requires that Technical Support System Engineer respond to a Technical Support Investigation Request (TSIR).

Contrary to the above, Technical Support failed to adequately respond to TSIR 96-N55-77-580, dated October 29, 1996 and TSIR No. 96-NSS-77-630, dated December 28, 1996, which identified offnormal and alarm conditions associated with the Turbine Driven Auxiliary Feedwater (TDAFW) sump pumps until March 13, 1997. On March 17, 1997, Technical Support determined that both sump pumps were significantly degraded, which potentially could have caused the TDAFW pump to overspeed.

"This is a Severity Level IV Violation (Supplement 1), for Unit 1 only."

- "E. Technical Specifications 6.8.1.a requires, in part, that procedures shall be established, implemented, and maintained covering the activities recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978, "Quality Assurance Program Requirements (Operations)." Appendix A of Regulatory Guide 1.33, Section 1, requires administrative equipment control.

Site Standard Practice (SSP)-12.53, Annunciator Disablement, Revision 5, requires that prior to the disablement of any annunciator the reason for the annunciator to be in the alarm condition shall be thoroughly evaluated.

Contrary to the above, on November 30, 1996, the Unit 1 Turbine Driven Auxiliary Feedwater sump high level annunciator was disabled without the reason for the alarm condition being thoroughly evaluated.

"This is a Severity Level IV Violation (Supplement 1), for Unit 1 only."

- "F. 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, requires that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected.

Contrary to the above, since September 18, 1990, the licensee had failed to implement prompt corrective action to resolve a condition adverse to quality as described in Problem Evaluation Report (PER) No. SQP900372PER. The PER described reactor core design changes which had been implemented and had not been reconciled or reflected in Nuclear Engineering (NE), design basis documents, environmental qualification binders. As of April 1, 1997, the EQ binders had not been revised.

"This is a Severity Level IV Violation (Supplement 1)."

- "G. 10 CFR 50, Appendix B, Criterion III, Design Control, requires in part that measures be established to assure that applicable regulatory requirements are correctly translated into drawings and procedures. The measures shall include provisions to assure that appropriate quality standards are specified and included in design documents. The design control measures shall also provide for verifying or checking the adequacy of design.

Tennessee Valley Authority Nuclear Quality Assurance Plan TVA-NQA-PLN89-A, Revision 6, Section 7.0, Design Control, requires that measures established to ensure that the performance of design analysis shall be planned and controlled. Additionally, it requires that measures to control plant configuration and ensure that the actual plant configuration is accurately depicted on drawings and other appropriate design output documents and reconciled with the applicable design basis shall be established, documented, and implemented.

TVA-NQA-PLN89-A, through Section 7.0 and Appendix B, endorses the requirements of ANSI N45.2.11-1974, Quality Assurance Requirements for the Design of Nuclear Power Plants. Section 4.0 of this standard requires that design analyses shall be performed in a planned, controlled, and correct manner. Design analyses shall also be in a form suitable for reproduction, filing, and retrieving.

Contrary to the above the established design control measures were deficient in that the following deficiencies were identified:

1. As of July 30, 1990, radiation dose values contained in design basis calculation TI-RPS-48, Integrated Accident Dose Inside Primary Containment and Annulus, Revision 3, were never incorporated in calculation TI-ECS-55, Summary of Harsh Environment Conditions for Sequoyah Nuclear plant, to ensure revision of environmental data drawing series number 47E235. Additionally, FSAR Figures 3.11.2-1, and 3.11.2-2 were never revised to reflect the 100-day integrated accident doses based on a source term of 1000 EFPD. This failure to control plant configuration and ensure that actual plant configuration was accurately depicted on drawings resulted in discrepancies in design basis information listed in FSAR Table 15.1.7-1 and FSAR Figures 3.11.2-1 and 3.11.2-2.



2. On December 12, 1991, TVA management approved design basis calculation TI-RPS-48, Revision 5, "Integrated Accident Dose Inside of Primary Containment and Annulus," to document the 100-day integrated beta and gamma radiation doses based on a source term of 650 EFPD. Radiation dose values contained in this calculation were not incorporated into calculation TI-ECS-55, "Summary of Harsh Environment Conditions for Sequoyah Nuclear Plant. Additionally, plant modification DCN No. 508114A, Revision 16, revised environmental drawings number 1,2-47E235 sheets 45, 47, and 48 to replace radiation values that were no longer conservative. These drawing revisions did not accurately depict actual plant configuration in that on the following dates listed the core average exposure for both units exceeded 650 EFPD operation.

<u>Unit No.</u>	<u>Cycle No.</u>	<u>Date EFPD Exceeded</u>
1	4	12-29-89
1	5	06-09-91
2	3	12-30-88
2	4	05-24-90
2	5	09-28-91

This failure to control plant configuration and ensure that actual plant configuration is accurately depicted on drawings resulted in discrepancies between the units current licensing basis of 1000 EFPD burnup criterion and approved design basis information depicted on the environmental drawings.

3. From February 11, 1994, to November 15, 1996, the licensee failed to perform a calculation to determine the integrated maximum hypothetical accident gamma and beta doses inside the primary containment to support a justification for continued operation for SQ PER-900372 PER.

"This is a Severity Level IV Violation (Supplement I)."

#### **VIOLATION A (50-327, 328/97-03-01) :**

##### **REASON FOR THE VIOLATION**

The reason for the violation was personnel error. On March 24, 1997, a recently qualified Assistant Unit Operator (AUO) was assigned to realign the Spent Fuel Pit Cooling (SFPC) system by placing the C-S pump in service. This realignment, in part, required opening the C-S pump discharge isolation valve. When the AUO arrived at the equipment location, he noted that the discharge isolation valve had approximately six inches of valve stem visible above the valve's handwheel (these particular valves had originally been supplied to accommodate motor operators; however, original system design did not include the installation of motor operators). As a result, he incorrectly believed that the valve was open. This incorrect belief was reinforced by the AUOs attempt to verify valve position. When the AUO attempted to close the valve, a small amount of movement of the handwheel was obtained. In returning the handwheel to its original position, the AUO exerted what was believed to be a reasonable force on the valve handwheel in the open direction until the handwheel ceased to move.

After performance of the system realignment and start of the C-S pump, the AUO observed flow on a local spent fuel pit flow indicator and incorrectly concluded that the realignment was complete and correct. The procedure did not direct the AUO to the flow indicator for flow verification. The flow indicator that was used was malfunctioning, had failed high and been tagged for maintenance and was associated with the flowpath that was not in service. The labels affixed to the indicators used only the indicator unique identification number, not a noun description that identified the flowpath. Subsequently, the AUO turned over the status of the system to the assigned watchstander. The AUO indicated the realignment that had taken place, the spent fuel pool temperature following realignment, and the procedural requirement to trend pool temperature until stable. Over the subsequent two hours, spent fuel pool temperature was trended and the watchstanding operator noted a temperature rise of approximately two degrees Fahrenheit.

Evaluation of the condition determined that when the AUO performing the realignment concluded that the 'as-found' condition of the discharge isolation valve was open, he should have called the control room to inform the control room operators. Since the procedure directed the AUO to open the valve, it would be expected that the valve would be in the closed position. The valve being in a position other than the closed position warranted additional discussion with control room personnel to ensure that a common understanding existed relative to system alignment. The AUO made an incorrect assumption that the indicated flow was associated with the C-S pump because that was the only spent fuel pit pump running. The procedure did not direct the AUO to the flow indicator because spent fuel pool temperature trending was the method used to determine cooling adequacy.

#### **CORRECTIVE STEPS THAT HAVE BEEN TAKEN AND RESULTS ACHIEVED**

Immediately after the event, management discussed the event relative to proper component manipulations during shift turnover with Operations personnel. Additionally, lessons learned after conducting the investigation were communicated to Operations personnel relative to the importance of performing STAR, the need to contact the control room when field conditions do not meet expectations, verification methodology for valve movement, and the need to use caution tags to inform other operators of deficient equipment conditions. This emphasized the actions that could have prevented the condition from occurring.

Based on temperature trending that was being performed in accordance with procedure, the AUO who made the original realignment was dispatched with a second, more experienced AUO watchstander to recheck the system lineup. The second AUO noted that six inches of valve stem above the handwheel is normal when this particular valve is in the closed position. The first AUO made another attempt to open the discharge isolation valve putting what he believed to be additional force on the valve handwheel and the valve opened. This reestablished normal circulation to the spent fuel pit and returned temperature to the previous level.

Maintenance personnel evaluated the C-S pump after running approximately two and one-half hours at shutoff head. No signs of overheating or excessive leakage were noted and the pump continues to perform normally.

A work order was initiated and worked to address the valve being difficult to operate. Maintenance personnel cleaned and lubricated the C-S pump discharge isolation valve stem and verified proper operation of the valve. The maintenance activity did not identify any other problems with the valve.

A Caution Order tag was posted to clearly indicate that the flow indicator was malfunctioning. Trains 'A' and 'B' flow indicators have been relabeled to clearly indicate the flowpath with which they are associated.

Permanent information posting placards have been posted on both the 'A' and 'B' train discharge valves to remind personnel of the unusual amount of valve stem that is visible with the valve in the closed position. Plant walkdowns and interviews with Operations personnel have determined that the extra stem associated with these valves is not an issue with other plant components.

An analysis of the event was performed and it was determined that the system operating instruction, SOI-78.1, "Spent Fuel Pit Coolant System," was adequate as written. Specifically, because of the system variables that are involved (component cooling flow and temperature to the spent fuel pit heat exchangers, spent fuel pool flow, and heat load in the spent fuel pool), the procedure requires that spent fuel pool temperature be trended to ensure cooling is adequate, and spent fuel pool flow is specifically excluded from the procedure. Nonetheless, the procedure has been revised to reference the applicable flow indicator when realigning flow to provide immediate feedback to the operators.

#### **CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FUTURE VIOLATIONS**

Valve position checking techniques such as observing valve stem movement during valve manipulation are being reviewed with AUOs as part of the requalification training program in Cycle 3 (the final crew is scheduled the week of June 9, 1997). This action will ensure that the AUOs understand the verification methodology for valve position and are able to apply this methodology generically to any rising stem valve.

The malfunctioning flow indicator is planned to be repaired by June 30, 1997. Following this action, the performance of the indicators in both trains of cooling flow will be evaluated and follow-up design changes will be developed as necessary.

#### **DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED**

With respect to the cited violation, TVA is in full compliance.

#### **VIOLATION B (50-327, 328/97-03-02) :**

#### **REASON FOR THE VIOLATION**

The reason for the violation was personnel error in that the craft general foreman who was required to verify breaker position failed to properly perform the work order prerequisite. The prerequisite contained in the work document for verification of the alternate feeder breaker, was performed by the craft general foreman on the incorrect breaker. As a result, when the wires in the bundle were simultaneously cut to facilitate the repair, the alternate feeder breaker to the 1A-A 6900-volt SDBD tripped, and an unanticipated diesel generator start occurred.

#### **CORRECTIVE STEPS THAT HAVE BEEN TAKEN AND RESULTS ACHIEVED**

Appropriate disciplinary actions have been taken with the individuals involved in the repair activity.



Immediately following the event, electrical maintenance work activities were suspended. An assessment of electrical maintenance shop employee performance was performed. This assessment resulted in the removal of approximately 33 percent of the individuals from plant duties because of inadequate fundamental skills. To correct this condition, additional evaluation and training has been performed. This action is being extended to other maintenance functional areas and management will continue to monitor worker performance as an ongoing process.

In the Operations area, the event was communicated through onshift briefings and by a follow-up training letter to licensed operators.

A site stand down was conducted to discuss the event and its causes.

Changes have been made to the emergent work process by use of a standing order to require a risk assessment by an SRO prior to conduct of emergent work. As a result, risk assessment is being performed for emergent work in context of work already scheduled.

### **CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FUTURE VIOLATIONS**

Management has instituted a site-wide initiative emphasizing the requirements for pre-job briefings and procedural adherence.

Applicable procedures for review of emergent work will be revised by July 25, 1997.

### **DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED**

With respect to the cited violation, TVA is in full compliance.

### **VIOLATION C (50-328/97-03-04) :**

#### **REASON FOR THE VIOLATION**

The reason for the violation was a lack of understanding of all the requirements that have to be satisfied for operability following reactor trip breaker maintenance. The decision to perform this activity on-line resulted in an ineffective assessment of technical specification (TS) surveillance requirements that had to be satisfied in order to return the breaker to operable status in Mode 1. As a result, an inadequate PMT was performed for the scope of the maintenance work that was done. Specifically, the turbine trip function of P-4 was not adequately tested in accordance with Surveillance Requirement 4.3.1.1.1.C.22.G for reactor trip breaker "A" because the Preventive Maintenance (PMs) that were being utilized to demonstrate operability were outside the 18-month required surveillance interval. Reactor trip breaker "B" was never inoperable because the PMs that were being utilized to demonstrate operability were within the 18-month required surveillance interval. Although continuity testing is a routine practice for normal surveillance testing, it is not considered a requirement to demonstrate operability unless there is a valid concern about circuit interruption.

## **CORRECTIVE STEPS THAT HAVE BEEN TAKEN AND RESULTS ACHIEVED**

Operations has established a permanent function in the Work Control Center for Return To Operability PMT planning. This function requires a review of maintenance work orders that involve TS required equipment for the purpose of specifying the surveillance instructions that must be performed to ensure that surveillance requirements are met. The requirements for this function include currently holding or having held an SRO license at SQN.

A multi-disciplined team was formed to conduct an investigation of the events. That investigation, which is now complete, identified the event root causes and corrective actions. Upon determining that operability of the Unit 2 reactor trip breaker "A" was invalidated, the turbine trip P-4 contacts were checked, found acceptable and the breaker was declared operable.

LCO related work activities that were deferred from the Unit 1 Cycle 7 and Unit 2 Cycle 7 refueling outages to online maintenance were reviewed to ensure that the TS SRs were fully satisfied. No problems were found with the PMTs specified for these activities and the applicable SRs were satisfied.

A sample of work orders was taken from the routine workweek scheduling program for return to operability and PMT adequacy. The sample was selected by 1) screening TSs for components with direct SRs and then reviewing recent maintenance history for these components; 2) screening the work order packages for the six work weeks in process and selecting the work orders on TS-related equipment for evaluation; 3) screening emergent work orders for 1996 and 1997 and selecting work orders for TS-related equipment for evaluation; and 4) review of Arrow Hart motor starter replacement PMT. No immediate operability issues were identified.

Management reinforced with the Operations staff that SRs must be met following any maintenance activity, emphasizing that refueling outage SRs could be invalidated when performing maintenance on-line.

Plant procedures have been revised to require that work order PMTs be structured in two parts: a) for maintenance tests, and b) for TS return to operability. Plant procedures have been revised to add a question to the Operations Work Pre-approval checklist to address work that could potentially invalidate a previously satisfied TS SR. Additionally, plant procedures were revised to require work order scope changes and/or PMT changes to be routed back through Operations for approval.

## **CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FUTURE VIOLATIONS**

The following recurrence control actions are to be taken: 1) revision of applicable procedures by September 30, 1997 to include a PMT matrix that identifies the SRs that must be met for return to operability for specific maintenance tasks on TS required equipment; and 2) revision of plant procedures before the next refueling outage to require an evaluation of TS requirements which must be met when an outage work activity is deferred to on-line maintenance.

## **DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED**

With respect to the cited violation, TVA is in full compliance.

## **VIOLATION D (50-327/97-03-06) :**

### **REASON FOR THE VIOLATION**

The reason for the violation was the lack of a questioning attitude and inadequate validation of assumptions by the TS Systems Engineer who reviewed and responded to the first TSIR. Review and verification of the TSIR response by TS management was also inadequate.

On October 29, 1996, Operations personnel initiated a TSIR because of the TDAFW pump sump level abnormal annunciation recurrently alarming. The TSIR requested an investigation of the flowrate into the sump as compared with the capacity of the pumps based on increased input flowrates into the Unit 1 sump from a previously completed modification. The TSIR was answered on November 21, 1996, by referencing the calculation supporting the modification that added the increased flow to the sump. The calculation concluded that the design capacity of the sump pumps was sufficient to handle the added sump input flow. The TSIR investigation did not include an evaluation of the actual pump capacity as opposed to design capacity. If this had been done, it would have been discovered that the sump pumps were functioning at less than design capacity, although still able to perform their design function of pumping down the sump. Alarms were generated since both pumps were required to pump the sump down with the increased input flow. TS management oversight and review of the TSIR investigation and response was also deficient and was a contributing cause of the failure to provide an adequate response.

On December 28, 1996, Operations initiated a second TSIR questioning sump input flow and pump operation. TS management and the assigned Systems Engineer failed to respond to the TSIR because of the incorrect belief that the previously answered TSIR resolved the problem.

### **CORRECTIVE STEPS THAT HAVE BEEN TAKEN AND RESULTS ACHIEVED**

Lessons learned were provided to Engineering personnel relative to lack of a questioning attitude and inadequate validation/verification for the TSIR investigation and inadequate management oversight/review of the TSIR investigation and response. In addition, the Engineering and Materials Manager now requires releases of TSIRs external to the Engineering Department to be reviewed by a designated senior Engineering Department supervisor or specialist prior to issuing TSIR responses.

A limited random sample of TSIRs were reviewed by TS and no timeliness or response adequacy issues were identified.

The sump overflow isolation valve was opened for both Units 1 and 2 sumps. This allowed any potential excess flow to be diverted to the Auxiliary Building radioactive waste system for processing in the event that the sump pumps failed to maintain the required level.

Pump performance of both the Units 1 and 2 sump pumps was evaluated and it was determined that the pumps were operating at less than rated capacity. It was also determined that the Unit 1 sump pump performance was below that of the Unit 2 pumps. Refurbishment of the Unit 1 pumps has been completed and a design change was implemented on Unit 1 to permanently configure the sump overflow valve open. Refurbishment of the Unit 2 pumps is ongoing. The design change to permanently configure the sump overflow valve open is planned to be performed before the end of the Unit 2 refueling outage scheduled in October 1997. Existing capacity of the Unit 2 sump pumps

is well above present input flow pending pump refurbishment. The Unit 2 overflow valve is being maintained open pending completion of the design change which will permanently configure this valve in the open position.

### **CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FUTURE VIOLATIONS**

The lessons learned related to this incident and the breakdowns which resulted in the inadequate TSIR response, will be included in the Engineering Support Training curriculum by August 15, 1997.

An independent review of a sample of TSIRs will be performed by personnel independent of the individual that responded to the TSIR to provide a high level of confidence that the identified TSIR deficiencies (inadequacy of response and promptness of response) does not constitute an adverse trend. This review will be completed by July 31, 1997.

### **DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED**

With respect to the cited violation, TVA is in full compliance.

### **VIOLATION E (50-327/97-03-07) :**

#### **REASON FOR THE VIOLATION**

The reason for the violation was the inadequate TSIR response as described in the response to Violation D (above) and the failure of Operations to establish adequate compensatory measures for the annunciator disablement. If adequate compensatory measures had been established, the annunciator could have been disabled with no adverse consequences from the degraded pumps.

On October 29, 1996, Operations personnel initiated a TSIR because of the TDAFW pump sump level abnormal annunciation recurrently alarming. The TSIR requested an investigation of the flowrate into the Unit 1 sump as compared with the capacity of the pumps based on increased input flowrates from a previously completed modification. The TSIR was answered on November 21, 1996 by referencing the calculation supporting the modification that added the increased flow to the sump. Subsequently, on November 30, 1996, the TDAFW pump sump high level annunciator was disabled by Operations. This action was based on operator observation of equipment operation and the alarm being determined to be a nuisance, and the ongoing operator rounds into the TDAFW pump room. As a result, the alarm was disabled without opening the sump overflow isolation valve for either the Units 1 or 2 sumps to ensure any potential excess liquid would be diverted from the TDAFW pump.

### **CORRECTIVE STEPS THAT HAVE BEEN TAKEN AND RESULTS ACHIEVED**

Lessons learned have been provided to Operations personnel relative to understanding the interaction between TDAFW pump operability and sump pump operability, the inadequate TSIR response, and the need to initiate a high priority work request for a sump alarm condition. This emphasized the actions that could have prevented the condition from occurring.

The sump overflow isolation valve was opened for both Units 1 and 2 sumps. This allowed any potential excess flow to be diverted to the Auxiliary Building radioactive waste system for processing in the event that the sump pumps failed to maintain the required level. Refurbishment of the Unit 1



pumps has now been completed and a design change implemented on Unit 1 to permanently configure the sump overflow valve open. The control room annunciator has been returned to normal.

Refurbishment of the Unit 2 pumps is ongoing. The design change to permanently configure the sump overflow valve open is scheduled to be performed before the end of the Unit 2 refueling outage scheduled in October 1997. Existing capacity of the Unit 2 sump pumps is well above present input flow pending pump refurbishment. The Unit 2 overflow valve is being maintained open pending completion of the design change which will permanently configure this valve in the open position.

Review of the condition by Operations determined that the procedures governing annunciator disablement were confusing. Based on this review, an Operations Standing Order was issued to require a written evaluation before defeating all but short-term nuisance alarms until the governing procedures are revised.

An operability review was performed by Engineering for currently defeated control room annunciators and did not identify any operability impacts.

#### **CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FUTURE VIOLATIONS**

The annunciator disablement procedures will be revised by June 30, 1997, to provide clear guidance to the Operator on evaluation requirements for annunciator disablements.

An engineering evaluation of each of the currently defeated annunciators will be performed by July 23, 1997 to determine the long-term acceptability of the disablement.

#### **DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED**

With respect to the cited violation, TVA is in full compliance.

#### **VIOLATION F (50-327, 328/97-03-08) :**

#### **REASON FOR THE VIOLATION**

The reason for the violation was a lack of management attention and direction. On September 18, 1990, a problem evaluation report (PER) was initiated to document that the effects of an increase in fuel burnup had not been addressed in the EQ program. Initially, the corrective actions were slow. The personnel involved with the issue were concerned with a potential change in the dose calculation methodology. Therefore, appropriate actions were not being taken to address the issue. The potential change in dose methodology would require the activity to be performed again after the change became effective. However, the change was not immediately forthcoming and the corrective actions were inappropriately delayed.

#### **CORRECTIVE STEPS THAT HAVE BEEN TAKEN AND RESULTS ACHIEVED**

The proper management attention and direction was taken in 1994 relative to resolution of the issue. The corrective actions established to correct the identified condition have been completed and the PER closed. The dose calculation and the design output documents have been revised to reflect the current design of the plant. Also, the EQ binders have been revised.

## **CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FUTURE VIOLATIONS**

No further corrective actions are required.

## **DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED**

With respect to the cited violation, TVA is in full compliance.

## **VIOLATION G (50-327, 328/97-03-09) :**

TVA denies that a violation of 10 CFR 50 Appendix B Criterion III exists.

### **Basis for Disputing the Violation**

TVA considers that design control was maintained following issuance of Calculation TI-RPS-048 "Integrated Accident Dose Inside Primary Containment and the Annulus." A revision to a calculation does not constitute a change to the design basis. The plant design basis is controlled by design output documents such as, drawings, scaling and setpoint documents, and general construction specifications. Calculations and design input documents such as, design criteria, and design standards support the design output documents. The official version of the calculation was always available and supported the design basis. Design basis changes do not occur until the design output documents are changed, regardless of changes to design input documents or calculations. Although the design input documented (Calculation TI-RPS-048) was revised, the design basis was maintained and a justification for continued operation (JCO) was established.

The NRC violation centers on TVA not incorporating Calculation TI-RPS-048, Revision 3, into the design basis of the plant. TVA made this decision because it recognized, after issuance of the calculation, that it did not properly account for a reduction of fifty percent in the calculated free-field beta dose. As a result, this calculation was unrealistic. The technical acceptability of reducing the calculated free field beta dose by fifty percent was identified by NRC as unresolved item 96-16-04 on January 13, 1997. The NRC accepted the technical basis for reducing the beta dose and closed the unresolved item in Inspection Report 97-03. Therefore, TVA considers it acted prudently and within NRC regulations by not incorporating Revision 3 of the calculation into the design basis.

Calculation TI-RPS-048, Revision 5, was issued to return the calculation to the conditions that were in effect at the time the problem of increased fuel burnup was identified. This revision was considered necessary to ensure that the calculation was consistent with the design output documents. The design output documents were maintained during the time that Calculation TI-RPS-048 was in question.

On September 18, 1990, a PER [corrective action document] was initiated to document that the effects of an increase in fuel burnup had not been addressed in the EQ program. A JCO was issued for the identified condition. On September 6, 1991, a revised JCO was issued based on Regulatory Guide 1.77 methodology. This methodology was used because of the industry known problems with the TID-14844 methodology being non-conservative for extended core burnup.

The JCO was assessed by the NRC and determined not to be appropriate because of the methodology used to determine the source-term. The NRC recommended that the source-term be determined using TID-14844 methodology. The evaluation was provided to TVA by letter dated November 30, 1993. A new source-term evaluation was performed using the TID-14844 methodology. The calculation to support the JCO was performed using a QA controlled computer program. The results of the computer run were utilized to revise the JCO. The computer run was not maintained since a computer rerun could be performed to support the information in the JCO. The practice in Engineering, at the time the JCO was revised, was not to maintain the computer run for a JCO. The calculation was reviewed, checked and incorporated into the PER. The revised JCO was submitted to NRC on March 4, 1994. The revised JCO was assessed and determined to be acceptable by the NRC. The approval of the JCO was provided to TVA on April 8, 1994.

Calculation TI-RPS-048, Revision 6, was issued on October 11, 1994 and the design output documents have been revised to reflect the results of the calculation.

Based on the above discussion, no violation of 10 CFR 50 Appendix B Criterion III occurred.

ENCLOSURE 2  
COMMITMENT TO NRC NOTICE OF VIOLATION  
INSPECTION REPORT NOS. 50-327, 328/97-03  
JON R. JOHNSON'S LETTER TO OLIVER D. KINGSLEY, JR.  
DATED MAY 12, 1997

**VIOLATION B (50-327, 328/97-03-02)**

Applicable procedures for review of emergent work will be revised by July 25, 1997.

**VIOLATION C (50-328/97-03-04)**

Revision of applicable procedures by September 30, 1997 to include a PMT matrix that identifies the SRs that must be met for return to operability for specific maintenance tasks on TS required equipment.

Plant procedures will be revised before the next refueling outage to require an evaluation of TS requirements which must be met when an outage work activity is deferred to on-line maintenance.

**VIOLATION D (50-327/97-03-06)**

The lessons learned concerning this incident and the breakdowns which resulted in the inadequate TSIR response will be included in the Engineering Support Training Program curriculum by August 15, 1997.

A independent review of a sample of TSIRs will be performed by personnel independent of the individual that responded to the TSIR to provide a high level of confidence that the identified TSIR deficiencies (inadequacy of response and promptness of response) does not constitute an adverse trend. This review will be completed by July 31, 1997.

**VIOLATION E (50-327/97-03-07)**

The annunciator disablement procedures will be revised by June 30, 1997, to provide clear guidance to the Operator on evaluation requirements for annunciator disablements.

An engineering evaluation of each of the currently defeated annunciators will be performed by July 23, 1997 to determine the long-term acceptability of the disablement.



# LICENSING TRANSMITTAL TO NRC SUMMARY AND CONCURRENCE SHEET

THE PURPOSE OF THIS CONCURRENCE SHEET IS TO ASSURE THE ACCURACY AND COMPLETENESS OF TVA SUBMITTALS TO THE NRC.

DATE \_\_\_\_\_ ORIGINAL DATE DUE NRC 06/11/97 - C EXTENDED DATE DUE NRC \_\_\_\_\_

SUBMITTAL PREPARED BY J. Bajraszewski ACTION NO. \_\_\_\_\_

FEES REQUIRED YES \_\_\_ NO XX PER No. SQ970772PER, SQ970883PER, LER 50-327/97-007, SQ970127PER, SQ970558PER, SQ970600PER, SQ971246PER.

PROJECT/DOCUMENT I.D. Sequoyah Nuclear Plant (SQN) - Reply to Notice Of Violation (NOV) 50-327, 328/97-03. The NOV identified seven violations that were characterized as failure to follow procedures, failure to perform adequate surveillance testing, failure to take prompt corrective action, and failure to maintain design control.

PURPOSE/SUMMARY Provide NRC with the reply to the NOV.

RESPONDS TO L44 970519 002 RIMS NO.) COMPLETE RESPONSE YES XX NO \_\_\_

PROBLEM OR DEFICIENCY DESCRIPTION NRC cited SQN with seven violations, see cover letter for a summary of the violation characterizations.

CORRECTIVE ACTION/COMMITMENT See enclosure 1 and 2 to the NOV response that contain corrective actions and commitments.

INDEPENDENT REVIEW N/A DATE \_\_\_\_\_

A concurrence signature reflects that the signatory has assured that the submittal is appropriate and consistent with TVA policy, applicable commitments are approved for implementation, and, supporting documentation for submittal completeness and accuracy has been prepared.

## CONCURRENCE

NAME	ORGANIZATION	SIGNATURE	DATE
J. D. Smith	SQN Site Lic Mgr.	<i>J. D. Smith</i>	6-11-97
J. S. Smith	SQN Site Licensing	<i>J. S. Smith</i>	6-12-97
E. J. Vigluicci	TVA OGC	<i>E. J. Vigluicci</i>	6-11-97
R. R. Rausch	SQN Maint and Mod Mgr	<i>R. R. Rausch</i>	6-11-97
H. H. Butterworth	SQN Operations Mgr.	<i>H. H. Butterworth</i>	6-11-97
J. Valente	SQN Eng and Mat Mgr	<i>J. Valente</i>	11/20/97
J. T. Herron	SQN Plant Mgr	<i>J. T. Herron</i>	6-11-97
APPROVED	<i>R. A. Shell</i>	DATE	6/11/97

## LICENSING MANAGER

NRC response or approval required? Yes \_\_\_ No XX

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