TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
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May 2, 1986

Director of Nuclear Reactor Regulation
Attention: Mr. B. Youngblood, Project Director
PWR Project Directorate No. 4
Division of Pressurized Water Reactors (PWR)
Licensing A
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Youngblood:

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

By the November 7, 1983 letter from L. M. Mills to E. Adensam of NRC, we provided our initial response which included a specific response to Item 1.2 of Generic Letter 83-28, "Required Actions Based on Generic Implications of Salem ATWS Events." As requested by the August 15, 1985 letter from E. Adensam of NRC to H. G. Parris, enclosed is additional information (enclosure 1) which should allow the satifactory completion of your evaluation. Enclosure 2 identifies the comments contained in enclosure 1.

Based upon the November 7, 1983 letter and the enclosed information, we believe that

1. We meet the intent of the criterion for recording parameters to ensure that a thorough evaluation is performed before restarting a unit after a reactor trip.

2. We are planning to implement changes in the storage capacity of the plant computer for time history recorders.

3. We are specifying storage of the reactor trip report for the life of the plant as a retrievable quality assurance record.

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Director of Nuclear Reactor Regulation May 2, 1986

Therefore, we believe that the information provided by this letter and by the November 7 letter from L. M. Mills adequately satisfies the requirements and intent of the requirements identified in item 1.2 of Generic Letter 83-28. Accordingly, the information presented to NRC in response to the 10 CFR 50.54(f) requirements provides the basis that the operating license for each unit (DPR-77 and DPR-79) at SQN should not be modified, suspended, or revoked.

If you have any questions regarding this subject, please call Jerry Wills at FTs 858-2683.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R. Gridley, Director
Nuclear Safety and Licensing

Enclosures
cc (Enclosures):

U.S. Nuclear Regulatory Commission
Region II
Attn: Dr. J. Nelson Grace, Regional Administrator
101 Marietta Street, NW, Suite 2900
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Mr. Carl Stahle
Sequoyah Project Manager
U.S. Nuclear Regulatory Commission
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ENCLOSURE 1

RESPONSE TO ITEM 1.2 OF GENERIC LETTER 83-28
AND AUGUST 15, 1985 LETTER FROM E. ADENSAM

SEQUOYAH NUCLEAR PLANT
DOCKET NOS. 50-327 AND 50-328

Item 1

All of the parameters specified in part 2 (review criteria) of the Technical Evaluation Report (TER), table 1.2-1, that should be recorded for use in a post trip review are not recorded.

Response

It has been interpreted that all items not circled on page 12 of the TER are acceptable; therefore, they will not be addressed in this response.

The Sequoyah sequence of events (SOE) and time history recorders are programmed to display information necessary to evaluate a plant reactor trip. These are reactor trips that occur in relationship with faults of moderate frequency from which the plant is capable of returning to power (referenced as conditon II events in the FSAR). There is no intent on the part of TVA to utilize these systems alone to analyze all chapter 15 accidents.

The response time and proper sequencing of protection equipment is regularly tested in accordance with the surveillance requirements of the technical specifications; therefore, a high reliability exists with respect to the timing and sequencing of this equipment. Because of this high level of confidence, the verification that the equipment has reached its accident condition, when required, is sufficient to verify its proper operation. Additionally, any off-normal operation of equipment that is observed by the Operations Staff during a reactor trip event is logged for permanent record in the reactor trip report. Using this as a basis, each parameter identified as not recorded, by circling on sheet 12 in the TER, is analyzed as follows:

A. Containment Isolation

Containment isolation is not a reactor trip causal function. For a condition II event, it would only exist in association with a spurious safety injection (SI) signal. All SI signals are monitored by the SOE recorder, and the emergency instructions require verification that the isolation valves have reached the required position; therefore, recording this parameter would not provide significant additional information that would be necessary for analyzing the root cause of the trip or proper equipment operation.

B. Control Rod Position

The reactor trip functions that are associated with control rod malfunctions (i.e., nuclear instrumentation startup excursion and rate trips) are monitored by the present system. One of the immediate operator responses after a reactor trip is to verify all control rods have tripped by observing the rod bottom lights. Because the functions which cause the trip are monitored and the proper tripped condition is verified, recording this function would not add significant additional information for analyzing the root cause of the trip or proper equipment operation.

C. Containment Radiation

High radiation levels in containment are not normally associated with a condition II event, and if it did exist, it would not cause a reactor trip. However, the parameter is monitored, and the information is available on a continuous analog recorder. Also, the high radiation level has an alarm; therefore, the information, if a high radiation level exists, is available to the personnel performing the posttrip analysis. Placing this parameter on the SOE recorder would not add significant additional information in determining the root cause of the trip or proper equipment operation.

D. Pressurizer Level

The pressurizer high level reactor trip set point is already recorded on the SOE recorder, and the analog level recorder charts are provided as part of every reactor trip package. This is consistent with part 2, table 1.2-1, of the TER.

E. Safety Injection; Flow, Pump/Valve Status

Each individual SI causal function is monitored by the present SOE recorder to identify the cause of a reactor trip. The flow and pump/valve status is verified by the Operations Staff as an immediate action in the emergency procedures. Any failure of the equipment to reach its proper accident state will be identified under the present system. The addition of this function to the SOE recorder would not provide significant information necessary for analyzing the root cause of the trip or proper equipment operation.

F. Main Steam Isolation Valve (MSIV) Position

The failure of a MSIV to the closed position during power operation is a readily apparent condition due to system parameters; therefore, the Operations Staff would be aware if the valve failed closed. In the case of the functions that require the valve to close, verification that the valve has closed ensures proper operation. The system upset associated with a steam generator causal trip function, due to the closing of a MSIV, would easily identify the area of concern for determining root cause.

G. Auxiliary Feedwater System; Flow, Pump/Valve Status

The system start is not a function that will cause a reactor trip; therefore, monitoring its status on the SOE recorder will not provide any information necessary to determine the cause of the trip. Verifying the proper operation of the system (i.e., pump start flow to the steam generators) is an immediate operator action on a reactor trip. This ensures any failure in the system will be identified. The addition of this function to the SOE recorder would not provide significant information necessary for analyzing the root cause of the trip or proper equipment operation.

H. AC and DC System Status (Bus Voltage)

The buses associated with safety equipment are monitored and alarmed on the main control panel. Additionally, the buses are verified to be properly transferred and powered as an immediate operator response after a reactor trip. Loss of an electrical bus that would cause a loss of equipment and result in a reactor trip would cause an alarm; therefore, sufficient time would be available before the trip to recognize the fault and take corrective action. If a trip did occur due to a bus failure, the operator would be well aware of the source of the malfunction. The addition of this function to the SOE recorder would not provide significant information necessary for determining the root cause of the trip or proper equipment operation.

I. Diesel Generator Status (Start/Stop, On/Off)

The status of the diesel generators (when required by shutdown board undervoltage or SI) is verified under immediate response of the emergency procedures. The buses and the diesels also have malfunction alarms to inform the Operations Staff if the equipment has failed after the initial start. Additionally, proper operation of this equipment is assured before it is shut down after start. The addition of this equipment to the SOE recorder would not provide significant information necessary for determining the root cause of the trip or proper equipment operation.

J. Power Operated Relief Valve (PORV) Position

The time associated with a PORV opening and the reactor coolant system pressure dropping to its low pressure reactor trip set point is of sufficient duration to terminate the event before a reactor trip occurs. Therefore, a PORV failing open should not cause a reactor trip. The system design at Sequoyah is such that the system pressure will not require lifting of the PORV during a reactor trip. However, the PORV is alarmed by both the stem position and the acoustic valve monitors and can be verified against the pressurizer pressure charts to verify that a PORV opening was proper for the pressure conditions. The closing of the valves after lifting can be verified by several different functions (i.e., acoustic valve monitor, tail pipe temperature, and pressurizer relief tank (level, temperature, and pressure)). The addition of this equipment to the SOE recorder would not provide significant information necessary for determining root cause of the trip or proper equipment operation.

K. Containment Sump Level

This parameter is not associated with the anticipated reactor trips covered by the SOE and time history recorders. An indication of level in the containment sump is indicative of a serious condition III or IV event that would require much more detailed long-term analysis before restart. Recording of the sump level would provide negligible useful information for the analysis of a reactor trip.

L. Primary System Flow

The assurance of proper reactor coolant system flow is monitored by three different parameters on the SOE recorder (i.e., low flow, reactor coolant pump undervoltage, and underfrequency). These functions will clearly indicate any condition indicative of inadequate flow. Additionally, to restart the unit (prior to entry into mode 2), all four pumps must be in operation and the flow adequate. Addition of this function to the time history recorder would not provide significant information for determining root cause of a trip or proper equipment operation.

Conclusion

The sequence of events recorder and time history recorder presently used, in conjunction with the plant parameter analog recorder charts and an excellently trained and qualified Operations Staff ensures a thorough review of any condition II reactor trip events. This will ensure that all safety equipment required to operate during the event operates properly and that the root cause of the trip is determined and corrected prior to restart. The verification that the plant has remained within its design envelope can be ensured by the parameters that are already recorded on the SOE recorder and time history recorder (i.e., primary system (pressure, level, temperature, and nutron flux), secondary system (pressure, level, and flows), and containment pressure). Also, any primary leakage would be detected on radiation monitors with the information available on a continuous analog recorder.

Based on our understanding, there is no evidence that the identified parameters would add to the credibility of the reactor trip report. Also, the cost of adding the parameters (designated as desired but not recorded in the TER) to the present system would be considerable, and the minimum benefit associated with the analysis of reactor trip events would not be sufficient to justify the changes.

Item 2

Time history recorders do not meet the minimum performance characteristics.

Response

The Sequoyah time history recorder meets and exceeds the sample interval as suggested in the review criteria; however, the pre-trip and post trip storage capacity of two minutes and three minutes respectively are less than the five minutes and ten minutes used for review.

Sequoyah agrees that extending the pre-trip and post trip storage capacity to five minutes and ten minutes respectively could be a benefit in analyzing reactor trip events. Additionally, due to changes in the storage capacity of the plant computer, the Instrument Maintenance Section should be able to implement this change by July 31, 1986. The implementation date is based on receipt of hardware needed to update the unit 2 computer by April 1986.

Item 3

The data retention procedures may not ensure that the information recorded for the post trip review is maintained in an acceptable manner for the life of the plant.

Response

Sequoyah's reactor trip report is made using a formalized administrative instruction. The instruction ensures that all applicable recorder charts and computer printouts are included as part of a package for permanent record storage. The package is reviewed by the Plant Operations Review Committee (PORC) and stored for the life of the plant as a retrievable quality assurance record.

MEF:DR
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ENCLOSURE 2

COMMITMENTS CONTAINED IN ENCLOSURE 1

In response to item 2 the following commitment is provided:

The pre-trip and post-trip storage capacity of the history recorder will be extended to five and ten minutes, respectively. This commitment should be implemented by July 31, 1986. However, the implementation date is based on receipt of hardware needed by April 1986 to update the unit 2 computer.