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SUBJECT: Forwards response to 850508 request for addl info re Generic  
 Ltr 83-28, "Generic Implications of Salem ATWS Event."

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October 2, 1985

Director, Office of Nuclear Reactor Regulation  
Attention: Mr. George W. Knighton, Branch Chief  
Licensing Branch No. 3  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Gentlemen:

Subject: Docket Nos. 50-361 and 50-362  
San Onofre Nuclear Generating Station  
Units 2 and 3

The purpose of this letter is to provide our response to the information you requested by letter dated May 8, 1985 on Generic Letter 83-28, Generic Implications of the Salem ATWS Event. Our response to your questions are provided in Enclosure 1.

If you have any further questions, please contact me.

Very truly yours,

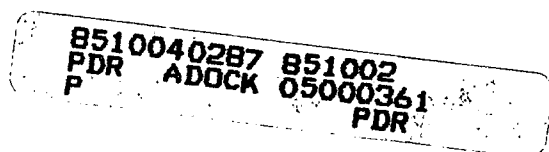
*M. O. Medford*

Enclosure

cc: Mr. H. Rood, Project Manager  
Licensing Branch No. 3

Mr. J. B. Martin, USNRC Regional Administrator, Region V  
Office of Inspection and Enforcement

Mr. F. R. Huey, USNRC Senior Resident Inspector  
San Onofre Units 1, 2 and 3



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1/1*

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION  
RELATING TO GENERIC LETTER 83-28  
SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2 AND 3  
DOCKET NOS. 50-361/362

1. Information Request for Item 2.2.1

Please submit a response to Item 2.2.1.6.

Response

Position 2.2.1.6 of Generic Letter 83-28 states the following:

"Licensees and applicants need only to submit for staff review the equipment classification program for safety-related components. Although not required to be submitted for staff review, your equipment classification program should also include the broader class of structures, systems, and components important to safety required by GDC-1 (defined in 10 CFR Part 50, Appendix A, "General Design Criteria, Introduction")."

Based on the above, only the equipment classification program for safety-related components needs to be submitted for staff review. Item 2.2.1.1 to Item 2.2.1.5 of our initial response to the subject Generic Letter dated November 29, 1983, submitted the equipment classification program for safety-related components.

2. Information Request for Item 3.1.1

Position 3.1.1 of Generic Letter 83-28 (GL 83-28) states that licensee reviews should "...assure that post-maintenance operability testing of safety-related components in the reactor trip system is required to be conducted and that the testing demonstrates that the equipment is capable of performing its safety function before being returned to service" (underlining added). Your response to this item (SCE letter dated November 29, 1983), indicates this guidance is met for the reactor trip breakers. For other safety-related components in the reactor trip system, however, your response is less definitive. For example, you indicate an inter-disciplinary review is utilized to determine the minimum test requirements. From this statement, it would appear that in some cases testing might not be required. Also it is not clear that 'minimum' test requirements would necessarily be the same as those required to assure the capability to perform the intended safety function.

Based on the foregoing, please address the following:

- a. Please state whether all safety-related components in the reactor trip system will be required to be tested following maintenance.
- b. If testing will be waived in some instances, please describe and justify the criteria to be used in granting such waivers.

- c. Please state whether the minimum post-maintenance testing will be sufficient to demonstrate the equipment is capable of performing its safety function before being returned to service.

Response

In our original response to this item dated November 29, 1983, it was reported that all maintenance orders receive an interdisciplinary review which specifies the minimum post-maintenance operability testing required. This program provided assurance that reactor trip system components are capable of performing their safety function before being returned to service. In addition, it was noted that a more definitive program for specifying post-maintenance testing was being developed which would obviate the need for the interdisciplinary review of retest requirements. Such a program has been developed and initiated. Under this program, the Post-Maintenance Retest Program (PMRP), the requirements for post-maintenance testing on equipment important to safety are specified.

The PMRP consists of testing performed to demonstrate that after repair, replacement, or adjustment to any safety-related equipment, the affected equipment is capable of performing its design function. All safety-related equipment in the reactor trip system is tested following maintenance activity per the PMRP. At the minimum, this post-maintenance testing demonstrates that the equipment operates per design documents and is capable of performing its safety function.

3. Information Request for Item 3.1.2

Position 3.1.2 of GL 83-28 states that licensees should submit the results of their checks of vendor and engineering recommendations to ensure that any appropriate test guidance is included in the test and maintenance procedures or the Technical Specifications, where required. Your response to this request is not clear. For example, you state, "Vendor and engineering recommendations have been reviewed and incorporated in reactor trip system test and maintenance procedures as appropriate." From this it is not clear whether this review was performed in response to the request contained in GL 83-28, or simply refers to the review performed during initial development of the procedures. Please state whether or not the review requested by GL 83-28 has been performed. If not, please provide a schedule for completing such a review. If such a review was performed, please provide the results as requested by GL 83-28.

Response

As described in our original response to this Generic Letter dated November 29, 1983, as a result of failure of Reactor Trip Breakers (RTB's) to function at Salem 1 (IE Bulletin 83-01), SCE performed its 18 month surveillance at SONGS 2 and 3, independently testing undervoltage (UV) and shunt trip functions of the RTB's. Four of the total of 18 RTB's tested failed to trip following actuation of their UV devices. All 18 tripped following actuation of the shunt devices.

SCE responded promptly to the failure of the UV devices to trip the RTB's by conducting a comprehensive investigation in conjunction with Combustion Engineering, the NSSS vendor and General Electric Company, the reactor trip breaker manufacturer.

Part of the extensive investigation of the RTB's was a review of vendor and engineering recommendations to assure their incorporation into reactor trip system test and maintenance procedures. This review, documented in a report submitted to the NRC by letter dated April 15, 1983, entitled "Reactor Trip Breakers," was not performed in response to the request contained in Generic Letter 83-28, but had been initiated on our own accord prior to issuance of Generic Letter 83-28. All of the requirements identified in Item 3.1.2 of Generic Letter 83-28 were addressed within this report. By letter dated May 2, 1983, the NRC staff's review of SCE's "Reactor Trip Breakers" report was documented.

In addition to this review, all maintenance procedures incorporating safety-related components undergo a biennial review. During the biennial review, vendor and engineering recommendations are checked, assuring their incorporation into maintenance procedures.

4. Information Request for Item 3.1.3

Results of review of test and maintenance programs should identify any post-maintenance testing that may degrade rather than enhance safety and should describe actions to be taken including submitting needed Technical Specification changes.

Response

As described in our "Reactor Trip Breakers" report submitted to the NRC by letter dated April 15, 1983, a post-maintenance testing task force was established to develop guidelines for testing requirements. All of the requirements identified in Item 3.1.3 of Generic Letter 83-28 were addressed by the task force. Based upon the guidelines developed by the task force, a procedure was produced for implementation of the retest program. From the development of these testing requirement guidelines, to date, no post-maintenance test requirements on SONGS Units 2 and 3 Reactor Trip System (RTS) components have been identified which can be demonstrated to degrade rather than enhance safety.

5. Information Request for Item 3.2.1

Position 3.2.1 of GL 83-28 states that licensees should "...assure that post-maintenance and operability testing of all safety-related equipment is required to be conducted and that the testing demonstrates that the equipment is capable of performing its safety functions before being returned to service" (underlining added). As with Position 3.1.1, your response leaves open the possibility that some components may not be required to be tested and addresses testing in terms of minimum requirements rather than assuring the capability to perform required safety functions. Accordingly, for the safety related components covered by Position 3.2.1, please respond to Items a, b, and c listed under Question 1, above.

Response

As described in the enclosed response to Item 3.1.1, the PMRP specifies the requirements for post-maintenance testing on equipment important to safety. This includes RTS components, as well as, all other safety-related components. Based on the PMRP, after the repair, replacement, or adjustment to any safety-related component, post-maintenance testing is performed. At the minimum, this post-maintenance testing demonstrates the equipment operates per design documents and is capable of performing its safety function.

6. Information Request for Item 3.2.2

Position 3.2.2 of GL 83-28 states that licensees should submit the results of their checks of vendor and engineering recommendations to ensure that any appropriate test guidance is included in the test and maintenance procedures or the Technical Specifications, where required. Your response of November 29, 1983, describes how station test and maintenance procedures have been developed, but does not describe the results of the check of vendor and engineering recommendations that was performed in response to this request. Please submit the results of your check of this documentation, and describe the corrective action that has been taken, if any.

Response

As a result of the comprehensive investigation initiated by the failure of the UV devices to trip the RTB's (described in the enclosed response to Item 3.1.2), SCE undertook an extensive review of vendor and engineering recommendations to assure that any appropriate test guidance is incorporated into all safety-related components test and maintenance procedures. Based on the results of this review, as described in the "Reactor Trip Breakers" report submitted to the NRC by letter dated April 15, 1983, test and maintenance activities have been revised.

In addition to this review, all maintenance procedures incorporating safety-related components undergo a biennial review. During the biennial review, vendor and engineering recommendations are checked, assuring their incorporation into maintenance procedures.

7. Information Request for Item 4.5.2

Please state that the plant is currently designed to permit on-line testing of the RTS. If not, either design modifications that will permit such testing shall be described along with an implementation schedule or justification for not providing on-line testing capability should be provided.

Response

San Onofre Units 2 and 3 are currently designed to permit on-line testing of the RTS.

8. Information Request for Item 4.5.3

Please provide results of review of existing or proposed intervals for on-line testing considering the concerns of 4.5.3.1 to 4.5.3.5 in the generic letter. Proposed Technical Specification changes resulting from this review should be submitted for review.

Response

A fault tree model for the postulated fault, "failure to trip the reactor", was constructed for SONGS Units 2 and 3. This model explicitly addressed random component failures, operator errors and out-of-service time for testing. Component failure rates were quantified using applicable operating experience data to perform a Bayesian update of WASH 1400 failure rate distributions. Common cause failure rates were quantified using operating experience data and the Vesely specialization of the Marshall-Olken algorithm. The fault tree models were quantitatively evaluated using Monte Carlo simulation to derive a system unavailability distribution. A sensitivity analysis was also performed to determine how sensitive the system unavailability was to variations in the failure rates of individual components.

The results of this analysis show that the median probability that SONGS Units 2 and 3 RTS will fail to trip the reactor is  $4.91 \times 10^{-6}$  per demand with a 95th percentile confidence limit probability of  $2.20 \times 10^{-5}$  per demand. This compares favorably to the NRC derived point estimate value of  $2 \times 10^{-5}$  per demand as the probability that the RTS would fail to trip the reactor for plants with a C-E supplied NSSS. Based on this, it is concluded that the current RTS test intervals are consistent with maintaining the high degree of availability expected of the RTS. Therefore, no proposed Technical Specification changes resulting from this review are currently planned to be submitted.

With regards to the RTB's, as described in our original response to this item dated November 29, 1983, SONGS Units 2 and 3 RTB surveillance was being performed monthly with the Preventative Maintenance (PM) being performed every two months. Subsequent to this, based upon the recent refurbishment of all RTB's to provide new bearings, and trending data showing no breaker degradation the conservative two month PM frequency was extended to a three month interval. Commencing at the completion of each PM, an additional month increment is being added until a six month PM interval is reached. This holding frequency was established by letter dated May 2, 1983, the NRC staff's review of SCE's "Reactor Trip Breakers" report.

During the time in which the PM frequency is being incremented, response time testing will continue to be performed monthly. However, to minimize breaker cycling, only the undervoltage trip response time will be tested. The shunt trip will continue to be tested at the PM interval.