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September 27, 1985

U.S. Nuclear Regulatory Commission  
Office of Inspection and Enforcement  
Region V  
1450 Maria Lane, Suite 210  
Walnut Creek, California 94596-5368

Attention: Mr. J. B. Martin, Regional Administrator

Dear Sir:

Subject: Docket No. 50-206  
IE Inspection Report 50-206/85-26  
Response to Notice of Violation  
San Onofre Nuclear Generating Station, Unit 1

Mr. D. F. Kirsch's letter of August 28, 1985, issued IE Inspection Report 50-206/85-26 and forwarded a Notice of Violation resulting from the inspection of the In-Service Test (IST) program conducted between July 22-26, 1985. Enclosure 1 to this letter provides our response to the Notice of Violation, as requested.

In addition to the Notice of Violation, Mr. Kirsch's letter notes that a large number of discrepant conditions were identified during the inspection, and it expresses concern that this may result from a lack of management attention to the effective implementation of the IST program. The letter requests that SCE address this issue in its reply, along with the actions that will be taken to ensure timely and effective corrective actions for the identified violation. Our response is provided in Enclosure 2 to this letter.

Finally, in order to also address the apparent discrepancies identified in the inspection report which were not referenced in the Notice of Violation itself, Enclosure 3 has been provided for your information.

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Mr. J. B. Martin

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SCE

We appreciate the opportunity to discuss in this submittal our response to your concerns which go beyond the specific items addressed by the Notice of Violation. In particular, where problems may reflect a lack of effective management involvement, we believe they should receive special attention. If you have any questions concerning this reply, or if you require any additional information, please so advise.

Sincerely,

*Wm. P. Bush*

Enclosures

cc: F. R. Huey (USNRC Senior Resident Inspector, Units 1, 2 and 3)

U.S. Nuclear Regulatory Commission  
Document Control Desk

Institute of Nuclear Power Operations (INPO)

ENCLOSURE 1

Response to the Notice of Violation contained in Appendix A to Mr. D. F. Kirsch's letter of August 28, 1985.

Appendix A to Mr. D. F. Kirsch's letter states:

"As a result of the inspection conducted on July 22-26, 1985, and in accordance with the NRC Enforcement Policy (10 CFR Part 2, Appendix C), the following violation was identified:

"Technical Specification 4.7 In-Service Inspection Requirements states in part 'In-service inspection of components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR 50, Section 50.55a(g)....'

- '1. ASME Section XI, subsection IWP-6250 Record of Corrective Action, states in part 'The record shall include a summary of the corrections made, the subsequent in-service test, confirmation of operational adequacy (IWP-3111) and the signature of the individual responsible for corrective action and verification of results.'
- '2. Paragraph 7.0 of the Licensee Engineering Procedure S01-V-2.14, Revision 5, In-Service Testing of Pumps Program states in part:

'7.1.3 Summary Record of Corrective Action (Check-Off Sheet 5.2).

This record shall include a summary of corrective action taken and the subsequent in-service tests or other methods used to confirm operational adequacy. The signature of the individual responsible for corrective action and verification of results shall be included. A copy of the Memorandum for File, Nonconformance Report (NCR) and/or Licensee Event Report (LER) will be attached.'

'7.2 This procedure and data described in 7.1.2 and 7.1.3 will be filed in the Station Engineering files and in the CDM Center.'

"Contrary to the above, at the time of the inspection, the licensee IST program records and station engineering files did not have available a complete summary of corrective actions taken with regards to pumps. As an example, feedwater pump G3B was repaired in May 1985, and there was no summary record of corrective action or a licensee check-off sheet 5.2 in the IST program records or station engineering files as required.

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

Response

SCE acknowledges the corrective action summaries for several tests were not completed as required by the In-Service Test (IST) procedures.

ENCLOSURE 1 (Continued)

Corrective actions, required as the result of pump testing, have been recorded on several documents, including memoranda, corrective action summaries and most often, through use of the San Onofre Maintenance Management System (SOMMS). SOMMS is a computer-based retrieval system containing the Maintenance Order (MO) records and is readily available to site personnel. MO document packages, which contain the equipment histories consisting of corrective actions and the resulting repairs, can be retrieved from SOMMS. Because the cognizant engineers, and other organizations, have utilized SOMMS successfully, the corrective action summaries have not been fully utilized as required by the procedure. Maintenance activities for the example given, Feedwater Pump G3B, were extensively documented on SOMMS.

However, SCE concurs that the specific requirement to provide a separate corrective summary sheet was not consistently satisfied. SCE believes this to be an administrative error and corrective action has been taken.

Corrective Steps which have been Taken and the Results Achieved

The Summary Record of Corrective Action for Feedwater Pump G3B was added to the IST test documentation.

The Station Technical Manager has issued instructions for all Technical Engineering Supervisors to intensify their review of the IST documents to ensure completeness and to stress the need for attention to detail and strict adherence to the procedure requirements for all test personnel.

Corrective Steps which will be Taken to Avoid Further Items of Noncompliance

Corrective action summaries will be incorporated into centralized files. All Maintenance actions associated with Section XI pumps will be placed in the Site Corporate Document Management files, under a controlled system of record management. Procedure S01-V-2.14, "In-Service Testing of Pumps," will be amended to initiate this change, and Engineering personnel will be instructed in the revised procedure. The Quality Assurance Organization will monitor the implementation process.

These program revisions will be implemented by December 27, 1985.

Date when Full Compliance will be Achieved

Full compliance was achieved on September 20, 1985, when the Summary Record of Corrected Action for this test, Feedwater Pump G3B, was placed in the centralized IST program file.

## ENCLOSURE 2

### Management Attention to In-service Test Program

#### SUMMARY

Management has given considerable attention to the development and structuring of the IST program and to its implementation in the field. Until recently, management had not given sufficient attention to the proper documentation and review of program data and to the maintenance of records required by program procedures.

Revisions are being made to the requirements for documentation of program data and for the maintenance of records. These revisions will simplify the process and facilitate the verification by management of proper program implementation.

#### BACKGROUND

The San Onofre IST program was developed in 1977 to meet ASME Code requirements then current and revised in 1984 to meet later requirements. Initially the program was conducted by a dedicated test group within the Station Technical division.

In 1984, management determined that the program would be more effective if it were decentralized and implemented by cognizant system engineers. Realizing the possibility that this decentralization would result in inconsistency and increased chance of personnel error, extensive training was conducted for all personnel. The results of the NRC inspection show that this training was not sufficient to avoid development of a significant number of documentation errors and inconsistencies in how the program is implemented.

#### DISCUSSION

Notwithstanding the shortcomings to date of the decentralized implementation of the IST program, SCE considers that use of the cognizant system engineers, instead of a dedicated test group, has improved the overall quality of the results obtained and is in the interests of program effectiveness.

As the decentralized program has been implemented, management attention has focused on ensuring that the tests are performed as required, that the conduct of the tests in the field is proper, and that the objectives of the IST program are met. Sufficient attention has not been focused on the resulting documentation.

Accordingly, the San Onofre Management Monitoring Program will be used to systematically provide attention over the next year to this aspect of the IST program. Qualified site management and supervision will formally review selected IST program records periodically, as they are developed. In addition, audits will be conducted by the SCE QA Organization of this area.

ENCLOSURE 3

Additional Information in Response to Details of IE Inspection Report

SO-206/85-26

1. Item 3.a

"There were several discrepancies between details provided in the program plan and actual site conditions. Pump relief request 7 states that Sea Water Pumps are submersible type pumps and thus vibration and bearing temperature measurements would not be made. However, Sea Water Cooling Pump ("C") is not a submersible pump. Vibration and bearing temperatures have been measured. In addition, for this pump, no differential pressure measurements have ever been taken as the required instrumentation was not installed. No relief request was written for this pump. The required instrumentation has recently been installed and the procedure is being revised to obtain the required information. Pump relief request 5 states that total flow from the combined Feedwater Pump test will be apportioned to each pump based on motor input amperage. In fact, the test procedure states that flow is assumed to be equal."

Additional Information

Saltwater Cooling Pump 'C' is being deleted from Pump Relief Request #7.

The differential pressure gauge had been installed and the revision to procedure S01-V-2.14.8, incorporating the gauge reading, was in the final stage of the review process at the time the inspection was conducted.

Through an oversight, the procedure for the feedwater pump test, S01-V-2.14.10, was not changed to reflect Pump Relief Request #5. The procedure has been corrected to include apportioning the flow based on the motor current.

2. Item 3.b

"Test procedures did not specify any tolerance for pre-set test parameters. Paragraph 6.3.1.8.5 of Procedure S01-V-2.14 states that 'Operations will adjust system to the reference value within a specified tolerance.' Discussions with system cognizant engineers indicate that values are set 'as close as we can.' Examples of tests where preset values varied from reference test values without explanation or justification include the August 14, 1981 Charging Pump "A" test where flow was set at 38 gpm versus a reference of 32 gpm. On

ENCLOSURE 3 (Continued)

November 19, 1984, on this same pump flow was set at 80 gpm versus a reference flow of 82 gpm. The flow for the Salt Water Pumps have varied at times from 50 to 400 gpm different than reference values. For this pump engineers are doing a pump curve evaluation so that a preset reference is apparently not required, however, this parameter is still listed as preset and some value and tolerance should be formally specified. The values for preset test parameters directly affect test results and evaluations and thus the required accuracy must be determined and achieved to provide valid test data."

Additional Information

SCE concurs that the cited test procedures do not specify tolerances for pre-set test parameters. The test procedures are being revised to include the appropriate tolerances. Other test procedures will be reviewed and revised as appropriate.

The cited values for the Charging Pump tests, and the 50 gpm value for the Saltwater Cooling Pump tests, indicate variances which SCE believes do not affect the pump performance test. The variances from reference values were due to plant operational considerations and the cognizant engineer correctly judged the test to be valid.

The reference flow values for the Saltwater Cooling Pumps were changed from 3900 gpm to a range of 3500-3600 gpm in 1983 to allow the pumps to be tested under actual operating conditions. An evaluation was completed and revisions to the procedure were made. However, in subsequent tests, the 3900 gpm value was incorrectly listed as the reference value resulting in an apparent discrepancy of 400 gpm. Procedure S01-V-2.14.8 is being revised to incorporate the correct reference values.

3. Item 3.c

"Reference values and test acceptance criteria must be entered on the Test Record form by the cognizant system engineer for each test performed. This approach, as opposed to a pre-printed listing of these values in the procedures or test form, may have contributed to the number of errors noted in this area. This concern is discussed more fully in paragraph 4 of this report."

Additional Information

SCE concurs that data transposition errors have been made. However, SCE prefers not to use pre-printed test forms because

ENCLOSURE 3 (Continued)

new reference values are often required after equipment maintenance has been performed.

Additional instructions have been given to test personnel and supervisors to closely scrutinize the data on the test record form.

4. Item 3.d

"Procedure SO1-1-6.64 for testing for relief valves (excepting Pressurizer and Main Steam reliefs) did not specify the increased testing required to be taken by the code when one valve tests unsatisfactorily. Discussions with responsible maintenance and engineering personnel indicated some confusion as to responsibilities and requirements in this area."

Additional Information

The procedure is being changed to include the test frequency requirements, incorporating the increase in test frequency required when a valve test is determined to be unsatisfactory.

5. Item 3.e

"The inspectors noted that for a great number of pumps, the evaluation of operability was based on comparison of pump test performance to the manufacturers pump test performance curves. Pump curve analysis is being used at San Onofre for Salt Water, Diesel Oil Transfer, RHR and Auxiliary Feed Pumps.

"The need to use Pump curve analysis usually indicates problems with system design or instrumentation needed to support the required tests or inadequate test procedures. The inspectors consider that the need for and use of vendor pump curve analysis should be reevaluated at San Onofre 1."

Additional Information

SCE has re-evaluated the use of vendor pump curve analysis and has concluded that such usage is appropriate.

Unit 1 was constructed prior to the development of the ASME Boiler and Pressure Vessel Code, Section XI standards. Therefore, some of the equipment is not testable in a configuration which allows exact system parameters to be chosen as specified by the code allowable ranges. This was previously discussed with the NRC in meetings held during the development of the IST program. SCE has included a detailed explanation of the Unit 1 program in the submittal made to the

ENCLOSURE 3 (Continued)

NRC in September 1977, and subsequent submittals. ASME IWP-3210, "Allowable Ranges of In-Service Test Quantities," specifically allows the owner to substitute range limits which allow the pump to fulfill its function.

6. Item 4.a

"Pump record files in engineering were very informal (kept by each system cognizant engineer) and of varying detail. The information requested to be retained in these working files is not delineated in site procedures or guides. Summary records of corrective action, check-off sheet 5.2 of procedure S01-V-2.14, were not complete for all pumps. For example, there was no summary for major Component Cooling Water Pump repairs in November 1981 or for Feedwater Pump B after bearing repairs in May 1985. These summaries are required to be kept for each pump by Code Subsection IWP-6250. This failure to implement code requirements on site is an apparent violation of paragraph 4.7 of technical specification for the San Onofre Nuclear Generating Station, Unit 1 (50-206/85-26-02)."

Additional Information

Procedure S01-V-2.14 is in the process of being revised to identify additional information which is to be placed in centralized files. As an example, calculational determinations and memoranda addressing the test program will be retained in these files.

The Summary Record of Corrective Action was added to procedure S01-V-2.14 on February 5, 1982 in order to upgrade the test procedure to be similar to the procedures utilized at Units 2 and 3. Because it was not required in 1981, there was no Summary Record of Corrective Action prepared for the component cooling pump repairs. Refer to Enclosure 1, "Response to Notice of Violation."

7. Item 4.b

"Reference values and acceptance criteria were sometimes recorded or recorded erroneously on Pump Test Record forms. For example:

- (1) Charging Pump "A" had acceptance criteria for differential pressure listed at 2240-2431 psi (94 to 102%) from the time of the reference test (August 23, 1981) until April 19, 1985 and later when it was changed to 2216 to 2331 psi (93 to 98%). The specified range should have been 2216 to 2431 psi (93 to 102%).

ENCLOSURE 3 (Continued)

- (2) On Charging Pump "A" no reference values were listed for tests run on November 11, 1984 and February 21, 1985.
- (3) The reference value for RHR Pump "B" differential pressure on the May 5, 1985 test was 84.4 psi, but the actual value was 85.4 psi.
- (4) The acceptance criteria for differential pressure on Feedwater Pump "A" on February 9, 1982 was calculated at 92 to 102%.
- (5) On Feedwater Pump "B," the calculated reference value for flow of  $4.96 \times 10^6$  lbm/hr on July 10, 1981 was erroneously listed on the December 11, 1981 test as  $4.5 \times 10^6$  lbm/hr and has been listed in error on every test since.
- (6) The acceptance range for differential pressure on the Turbine Driven Auxiliary Feed Pump was erroneously changed from 1257-1379 psi to 1257-1397 psi on the November 6, 1981 test and has been carried through in error on each test since. These errors are considered relatively minor and in some cases result in more conservative criteria. However, considering the importance to the IST effort of accurate reference values and acceptance criteria and the number of discrepancies noted, it appears that much greater attention to detail is necessary."

Item 4.c

"The column on the Pump Test Record for indicating which parameters are pre-set are not always marked. This was observed for numerous tests including RHR, Charging, Feedwater, Hydrazine Spray and Component Cooling Water pumps."

Item 4.d

"Reference value test identification numbers and/or dates were listed in error on Pump Test Record forms. Examples include Feedwater Pump "A" tests on February 25, 1985 and May 14, 1985 and Feedwater Pump "B" test on May 8, 1985."

Item 4.g

"Several miscellaneous and rounding off errors were noted in older Pump Test Reports (1980-1982)."

ENCLOSURE 3 (Continued)

Additional Information

SCE acknowledges these inconsistencies and errors in recording information. Instructions are being given to the supervisors and cognizant engineers stressing the need for attention to detail in completing test procedures. Additionally, Quality Assurance audits will be conducted in 1985, or early 1986, which will concentrate in these areas concerning attention to detail.

8. Item 4.e

"The acceptance criteria for the Diesel Oil Transfer Pumps, outlined in a 1981 memorandum, is to compare the test pump head to the manufacturer's curve. However, no acceptance range or limits are specified for the evaluation. In fact, test data points have fallen significantly below the pumps curve and the pumps have continued to be considered acceptable with no additional analysis or corrective action performed. Tests on the "A" pump were as low as 60% on the June 24, 1983 test and has been in the 60-65% range since 1982. Specific acceptance criteria needs to be established and the adequacy of the current test procedure and instrumentation to perform IST on these pumps needs to be determined."

Additional Information

SCE is unable to determine why the 1981 memorandum did not address the acceptance criteria range; since the cited issue is over four years old, the information cannot be reconstructed. SCE acknowledges the acceptance criteria were not formally revised to reflect the new reference data.

In September 1982, the methodology for testing the diesel fuel oil transfer pump was revised to accommodate operational requirements. When the revised test was conducted, a uniform decrease in the flow values, to approximately 60% of the pump curve, for all four pumps was observed. An undocumented engineering evaluation of the pump performance using the new test method was made and it was determined that the pumps continued to operate satisfactorily based on the head capacity curve. The change in the test data was due to the change in the test method, and was not caused by pump degradation. The evaluation of new acceptance criteria was performed utilizing the ASME Section XI Code, and it was found to be acceptable.

ENCLOSURE 3 (Continued)

It was also determined that the pumps were able to provide approximately seven times more fuel oil than is required by the diesel generators. Additionally, the test data were consistent for all four of the pumps and continued to be consistent in every subsequent test. Based on this, SCE believes the current test procedure has been adequate to detect any degradation in the pump performance.

Although the current procedure is adequate to verify the operational readiness of the diesel fuel transfer pumps, the procedure will be revised to reflect new acceptance criteria with specific limits.

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