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AUTH. NAME AUTHOR AFFILIATION
METZ, C.R. Carolina Power & Light Co.
RECIP. NAME RECIPIENT AFFILIATION
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SUBJECT: Responds to NRC ltr re violations noted in insp rept
50-261/93-12. Corrective actions: administrative limit imposed
on max pressure to which valves could be throttled to ensure
valves maintained above min throttle position.

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H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261
LICENSE NO. DPR-23
NRC INSPECTION REPORT NO. 50-261/93-12 REPLY TO A NOTICE OF VIOLATION

Gentlemen:

Carolina Power and Light Company hereby provides this reply to the Notice of Violations identified in NRC Inspection Report 50-261/93-12.

Enclosure 1 provides a description of the occurrence, the causal factors and root causes identified for each violation, and a discussion of the corrective actions taken and planned for each occurrence.

Should you have any questions regarding this matter, please contact Mr. D. B. Waters at (803) 383-1802.

Very truly yours,

Charles R. Dietz
Vice President
Robinson Nuclear Plant

RDC:lst

cc: Mr. S. D. Ebnetter
Mr. W. T. Orders
INPO

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REPLY TO NOTICE OF VIOLATION 92-12-01:

10 CFR 50, Appendix B, Criterion III, "Design Control", requires, in part, that measures shall be established to assure applicable regulatory requirements and design bases for systems and components are correctly translated into procedures.

Contrary to the above, as of July 2, 1993, measures were not established to maintain the design basis of the safety related portion of the service water system in that:

- a. Operating Procedures did not specify minimum positions for the component cooling water heat exchanger outlet valves. This could have allowed the non-safety related turbine building loads to remain un-isolated, reducing cooling to safety related loads such that they could not fulfill their safety related functions in response to a loss of coolant accident.
- b. OP-903, Attachment 9.1, "Service Water System Valve Checklist," contained seven valves listed as open that were designated throttled on design documents and one valve listed as throttled that was designated as open on design documents.

REPLY

CP&L acknowledges that the violations occurred. Each of the examples cited are addressed below.

1. The Reason for the Violation

Item a:

The cause of this violation is attributed to inadequate interface between CP&L's Nuclear Engineering Department (NED) and plant Technical Support personnel. Causal factors include the lack of NED reviews in the original establishment of the limits, and oversight on the part of Plant and NED personnel of minimum throttle positions as an impacting parameter during the review process of a subsequent modification to the system.

The maximum throttle positions were originally established based on Service Water flow balancing data from system tests. Data from these tests was used to verify engineered flow models. Plant Technical Support engineers used the tests to establish procedural controls on maximum throttle limits following maintenance on valves. By oversight, minimum throttle positions were not considered by Plant or NED personnel during the design and review of a subsequent modification to the system.

The modification that installed the automatic isolation on low service water pressure with a turbine trip did not provide a minimum throttle position or maximum outlet pressure to prevent inadvertent defeat of the automatic function. Neither Plant nor Design Engineering reviews of this modification identified concerns with these parameters.

Item b:

The Notice of Violation correctly identifies a discrepancy between the valve positions established in the field and the positions specified in Operating Procedure OP-903. The OP listed the valve positions as OPEN whereas the valves were maintained throttled in accordance with information provided on valve tags in order to provide a proper flow balance and ensure a minimum flow to each penetration cooler. This is not an appropriate method for controlling valve positions. In addition, the OP incorrectly identified one valve as THROTTLED which was required to be open.

2. The Corrective Steps That Have Been Taken and the Results Achieved

Item a.

The immediate response to this issue was to impose an administrative limit on the maximum pressure to which the valves could be throttled, thereby ensuring the valves are maintained above the minimum throttle position. Verification of this condition is performed during Control Room logkeeping activities.

Adverse Condition Report ACR 93-139 was initiated to document the failure of Operating Procedures to specify minimum throttled positions for the component cooling water heat exchanger outlet valves. The evaluation of this ACR is in progress. Calculations utilizing flow models performed by NED are under review to assure operating procedures reflect the appropriate configurations.

Item b.

OP-903 was revised (Rev. 47) to specify the proper valve positions. Adverse Condition Report 93-153 has been initiated to facilitate investigation of the root cause of the conflicting information regarding the position of these valves.

3. The Corrective Steps That Will Be Taken to Avoid Further Violations

Item a.

Calculations utilizing flow models performed by NED will be reviewed to assure operating procedures reflect the appropriate configurations.

An internal assessment by the Nuclear Assessment Department (NAD) previously identified an inadequate interface between the Nuclear Engineering Department (NED) and the RNP Technical Support organizations. In response to the assessment, interfaces between these organizations will be strengthened and formalized. This will include modification and non-modification activities. Additionally, the NED and RNP interface will be enhanced by integration of NED personnel into site activities and processes with the establishment of a full support design group at the site.

Item b.

An ACR has been initiated to determine why the actual valve positions differed from the OP line up and why this was not identified. Positioning of valves in accordance with unapproved instructions on valve tags instead of approved procedures is inconsistent with RNP Operations Management expectations. The need of improvement in the area of procedure compliance within the Operations organization and the management expectation for improvement in this critical function has been communicated to each operating shift by Operations management.

4. The Date When Full Compliance Will Be Achieved

Item a:

Flow calculations will be reviewed against procedures by December 15, 1993.

Interim measures requiring formal transmittal of design data for non-modification activities has been established between the NED and RNP System Engineering group. Formal procedures will be complete by December 31, 1993.

The integration of NED into an expanded site function has begun and is anticipated to be fully implemented by September 30, 1994.

Item b:

The ACR evaluation will be completed, and corrective actions will be implemented prior to startup from Refueling Outage 15.

REPLY TO A NOTICE OF VIOLATION 93-12-03

10 CFR 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures shall be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety related functions of structures, systems, and components.

The licensee's accepted Quality Assurance Program, Section 17.2.3, requires, in part, that design changes to the facility be accomplished in a planned and controlled manner in accordance with written, approved procedures and that there is an adequate review of the suitability of material, parts, equipment, and processes which are essential to the safety related functions of structures, systems, and components.

Contrary to the above, as of July 2, 1993, the licensee had modified the pressure boundary of three safety related air-to-service water heat exchangers with a proprietary epoxy based material without evaluating the suitability of the application.

REPLY

CP&L acknowledges the violation.

1. The Reason for the Violation

In 1982, the use of the subject epoxy based material as a method of repairing tube leaks on the air-to-water heat exchangers was evaluated by Engineering Evaluation 82-65 to be acceptable as a temporary repair. Subsequently, repairs were made via Corrective Maintenance procedure CM-212, "Service Water Air Cooler Tube Leak Repair", which was developed to provide guidance to Maintenance personnel performing the repairs. Use of CM-212 did not require 10 CFR 50.59 evaluations prior to each leak repair.

2. The Corrective Steps That Have Been Taken and the Results Achieved

NED is currently evaluating the suitability of using the subject material on the air-to-service water heat exchangers. This evaluation will be completed prior to start-up from Refueling Outage 15. In the interim, no additional repairs to the air-to-service water heat exchangers will be made.

3. The Corrective Steps That Will Be Taken to Avoid Further Violations

The specified material will not be used for pressure boundary repairs on ASME Code Class 1, 2, 3 systems without prior approval of the NRC under the guidance of Generic Letter 90-05.

Use of this material in future similar applications (air to water heat exchangers) will be performed per the design change process.

4. The Date When Full Compliance Will Be Achieved

The evaluation of the suitability of the current application of the specified epoxy material on the air-to-service water heat exchangers will be completed prior to start-up from Refueling Outage 15.

REPLY TO A NOTICE OF VIOLATION 93-12-04

Technical Specification 6.5.1.1, "Procedures, Tests, and Experiments," Subsection 1, requires, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Rev. 2, February 1978. Appendix A, Section 6.g, requires procedures for combating emergencies and other significant events including loss of service water, and Section 1.a requires administrative procedures for equipment control.

Contrary to the above, as of July 2, 1993, inadequate written procedures were established and maintained in that:

- a. AOP-022, "Loss of Service Water," would not provide fire suppression system water as backup supply to the control room HVAC coolers following a single failure of the north service water header at a pressure below the design pressure rating of the heat exchanger.
- b. AOP-022, "Loss of Service Water," would not provide the required Primary Water Storage Tank backup cooling water to the Safety Injection pump thrust bearings with sufficient pressure to perform its intended safety function.

REPLY

CP&L acknowledges the violation. Each of the examples cited are addressed.

1. The Reason for the Violation

Item a:

This violation is attributed to an oversight during the Design Verification process of a revision to AOP-022 during 1990. Because of this oversight, the Safety Analysis and the subsequent Safety Review process did not consider that the Fire Water pressure at the Water Cooled Condensing Units (WCCU) could be in excess of the 100 psig design limit.

Item b:

AOP-022 contains guidance for supplying the SI pumps thrust bearings with a backup supply of cooling water from four potential sources. These are the discharge of each Primary Water (PW) pump, the PW tank via gravity drain, and Fire Water. This provision was added to AOP-022 to improve RNP's calculated frequency for core melt by reducing the effects of a loss of Service Water. Since the SI pumps are provided with Service Water from redundant headers, the provisions for backup cooling address events which are beyond the design basis of the plant.

AOP-022 relies upon the Operators' knowledge and skill to select the most appropriate option for supplying the cooling water backup. Guidance was not provided on the limitations of the PW tank gravity drain option relative to tank level. The tank is normally maintained close to full, and would therefore be expected to provide an adequate cooling source. In the event this option was selected with an insufficient tank level, the Operator would determine that adequate flow was not available and would have expended unnecessarily the time required to implement the option specific procedure steps. CP&L agrees that AOP-022 should contain guidance to ensure effective and efficient implementation of the backup cooling options.

2. The Corrective Steps That Have Been Taken and the Results Achieved

Item a:

Adverse Condition Report ACR 93-138 was initiated to document the inadequacies of AOP-022 and to determine the root cause of the inadequacies and recommend corrective actions.

In response to the Design Verification programmatic concerns, the qualification program for lead engineers and design verifiers has been enhanced. The enhanced program includes formal training and testing of all personnel who are qualified to perform DVs.

Item b:

For normal Primary Water (PW) tank level conditions, this backup cooling water option is considered viable. However, the backup cooling water options provided in AOP-022 have been reassessed and the PW tank gravity drain option is no longer considered necessary and will be deleted. The three other options are adequate and do not impose a burden on the Operators for monitoring PW tank level.

3. The Corrective Steps That Will Be Taken to Avoid Further Violations

Item a:

The enhancements which have been made in the qualification program for lead engineers and design verifiers will preclude recurrence of this violation. No further corrective steps are planned.

Item b:

AOP-022 will be revised to delete the Primary Water gravity drain option and to prioritize the remaining options. The reliance on Operator knowledge and skill to select an appropriate option without guidance on the limiting conditions for their use will be eliminated.

4. The Date When Full Compliance Will Be Achieved

The revision to AOP-022 to delete the option for cooling the SI Pump thrust bearings will be approved prior to startup from Refueling Outage 15.

REPLY TO NOTICE OF VIOLATION 93-12-06

10 CFR 50.55a (a), "Codes and standards," requires, in part, that components that are classified as ASME Code Class 1, 2, and 3, must meet the inservice test requirements set forth in Section XI of the ASME Boiler and Pressure Vessel Code except in cases where an acceptable alternative has been approved by the Director, Office of Nuclear Reactor Regulation.

CP&L letter dated August 1, 1991, requested relief from the normal pump vibration testing requirements of paragraph IWP-4500 of ASME Section XI and proposed to satisfy pump vibration requirements of performing ASME/ANSI OMa-1988, Part 6. The licensee's relief request specified that the acceptance criteria would be the most limiting of $2.5V_r$ or 0.325 in/sec for the alert range and the most limiting of $6V_r$ or 0.7 in/sec for the required action range. In a letter dated June 1, 1992, the Office of Nuclear Reactor Regulation approved the relief request.

Contrary to the above, as of July 2, 1993, the licensee had not always established the most limiting pump vibration acceptance criteria in that the acceptance criteria for service water pumps A and B and service water booster pump B for vertical vibration velocity measurements and the acceptance criteria for service water booster pump A for the vertical and horizontal vibration velocity measurements were based on 0.325 and 0.7 in/sec instead of $2.5V_r$ and $6V_r$ which would have been more limiting.

REPLY

Although no response was required, CP&L provides the following information relative to the NRC Inspection Report and CP&L's interpretation and resultant application of the OM-6 ranges.

On page 13 of the Inspection Report, the issue is discussed only from the viewpoint of the 0.075 in/sec vertical vibration reference value measured on "A" Service Water Booster Pump (SWBP). It fails to discuss the complementary issue, that being the 0.12 in/sec horizontal vibration value taken on the same bearing of the pump. It is the relationship between these two numbers that is not adequately explained in the report, but is key in the formulation of CP&L's interpretation.

The issue over what is the most limiting range for vibration values arose due to the mathematics involved in setting ranges when the reference value for one direction (either horizontal or vertical) falls at or above 0.12 in/sec and the reference value in the other direction falls below 0.12 in/sec. When both values fall above or below 0.12, then the issue of the most limiting criteria to use is clear. However, when one value falls above 0.12 in/sec and the other falls below, a decision regarding the most limiting OM-6 criteria must be made.

The NRC interpretation yields a value of 0.187 in/sec for the Acceptable Limit in the vertical direction. Note that the normal running vibration value, just 90 degrees away, on the same bearing, was measured at 0.12 in/sec. OM-6 does not differentiate between directions in its instructions relating to application of the most limiting ranges. This raises the key point that was discussed during the inspection but the NRC audit report fails to mention, i.e., that application of ranges based on the NRC interpretation could yield vibrations limits in one direction that are less than normal, acceptable running vibration levels 90 degrees away on the same bearing. This is considered not to be technically justifiable and not an appropriate interpretation of the OM-6 criteria. Application of ranges in this manner could result in declaring a pump to be in the Alert Range for a vibration level lower than the normal running vibration 90 degrees away on the same bearing. This would result in increased testing, and in some cases increased wear due to recirculation loop testing, for vibration values that do not threaten acceptable pump operation. It also penalizes utilities for having smooth running equipment by imposing ranges based on the lower directional reference value, ignoring the reality of the comparison to higher, acceptable value 90 degrees away.

CP&L understands fully that the logic behind the 2.5 Vr criteria was to ensure that vibration levels that increase by 2.5 times reference may be indicative of an adverse trend and should be monitored on an increased frequency. However, CP&L also understands that 0.325 in/sec represents acceptable vibration for any safety-related pump governed by the testing requirements of OM-6. We also understand that 0.325 in/sec has basis in testing and has been a limit recognized by industry for decades.

REPLY TO NOTICE OF VIOLATION 93-12-07

10 CFR 20, Appendix B, Criterion V, "Instructions, Procedures and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented procedures and that such activities be accomplished in accordance with these procedures.

CP&L Maintenance Management Manual Procedure MMM-006, Calibration Program, specifies the methods and procedures used in assuring the calibration of safety related instrumentation and requires in part, that in the event a calibration is found out-of-tolerance, a technical review shall be performed evaluating the effect of the out-of-tolerance parameter on plant safety and address the corrective action. The review shall be documented and filed with the completed calibration sheets.

Contrary to the above, on numerous occasions in 1991, 1992, and 1993, activities affecting quality were not accomplished in accordance with documented procedures in that the required review to evaluate the effects of out-of-tolerance parameters on plant safety were not performed, documented, or filed with the completed calibration sheets when the following parameters were found to be out-of-tolerance:

FI-1698C, HVH-3 Return Water Flow on October 23, 1991
DPS-1608B, North Service Water Strainer on January 7, 1993
DPS-1698A, HVH-1 Return Service Water Flow on October 8, 1991
DPS-1698D, HVH-4 Return Service Water Flow on October 8, 1991
DPS-1608A, South Service Water Strainer on January 7, 1993
FI-1698A, HVH-1 Return Water Flow on October 26, 1992
DPS-1698B, HVH-2 Return Water Flow on October 26, 1993

REPLY

CP&L acknowledges the violation.

1. The Reason for the Violation

Plant Operating Manual Procedure MMM-006 prescribes the methodologies utilized for calibration and control of measuring and test equipment, active safety related plant instrumentation, and special tools used in activities involving safety related systems and equipment. This procedure further describes the responsibilities of the personnel controlling the activities. The cause of this violation is attributed to a lack of understanding by the Maintenance Supervisors of the processes required to be utilized for out-of-tolerance calibrations as prescribed by MMM-006.

2. The Corrective Steps That Have Been Taken and the Results Achieved

The required reviews for the out-of-tolerance equipment identified within the Notice of Violation have been performed, documented, and filed with the completed calibration sheets.

Adverse Condition Report 93-143 was initiated to document this concern and to initiate a root cause evaluation. Based on the findings of the evaluation, the Maintenance Manager has discussed this concern with the Maintenance Supervisors. As a result of this discussion, the Maintenance Supervisors are fully aware of their expectations concerning adherence to procedure MMM-006 for the processes utilized for disposition of documentation for out-of-tolerance equipment.

3. The Corrective Steps That Will Be Taken to Avoid Further Violations

In order to preclude recurrence of this violation, a sampling of calibration sheets will be reviewed to determine if additional evaluations were missed, and any additional evaluations determined to be necessary will be completed.

4. The Date When Full Compliance Will Be Achieved

Full compliance will be achieved with the completion of the corrective actions stated above by December 1, 1993.