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DUKE POWER

January 31, 1990

Director, Office of Enforcement
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attn: Document Control Desk

Subject: Catawba Nuclear Station, Units 1 and 2
Docket Nos. 50-413 and 50-414
NRC Inspection Report Nos. 50-413/89-25 and 50-414/89-25
Reply to a Notice of Violation
Answer to a Notice of Violation

Gentlemen:

Attached is Duke Power Company's response to the Notice of Violation and Imposition of Civil Penalty dated December 19, 1989. My response is divided into four attachments. I appreciate the NRC's consideration in extending the required response date for these violations to January 31, 1990.

Attachment I and II are associated with the Level III violation and proposed Civil Penalty involving Duke's failure to take adequate corrective action following the Turbine Driven Auxiliary Feedwater Pump surveillance test failures of July 31, 1989.

Attachment I is my request for full mitigation of the proposed civil penalty. It is my perception that in light of the details surrounding this particular event, there must be either a misunderstanding of the issues by the Staff and Region personnel, or a failure to consider all the information Duke has presented. As the NRC reviews my request for mitigation of the civil penalty, I encourage ONRR and Region II personnel to seek Duke's involvement to ensure an accurate understanding of the events in question.

Attachment II is my response to the the Level III violation. I admit that the violation occurred and that some errors in judgement were made. However, I believe the NRC Staff has failed to give Duke Power proper credit for the plant strategies and activities surrounding this event. The initial decisions that were made concerning the root cause of the pump test failures were reasonable based upon information available at that time. When it was discovered that erroneous conclusions had been reached, the follow-up work was handled in a thorough and timely manner. Additionally, subsequent corrective actions were unusually broad and ultimately led to the full understanding and resolution of this problem.

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At the Enforcement Conference held on October 12, 1989, Duke personnel explained in detail the events surrounding this violation. The minimal safety significance of this event was also discussed at this meeting. The final decision regarding the enforcement action to be taken should give full consideration to all of the issues presented at the Enforcement Conference as well as those items documented in Attachments I and II.

Attachments III and IV are the responses to the Level IV violations "A" and "B" cited in Section II of the Notice of Violation. Violation "A" pertained to having all three, Unit 2 Auxiliary Feedwater Pumps inoperable for approximately 35 minutes. The pumps were inoperable because an automatic swapover feature which aligns the pump suctions to the assured water source was defeated. Violation "B" pertained to a procedure that was inadequately written and two procedures that were not fully implemented thereby contributing to this event. As discussed in the attachments, I admit that the violations occurred.

There is an area of concern that I have with the enforcement policy and the way it was administered for this particular escalated enforcement item as well as others in the past. It pertains to Duke not being involved in the discussions within the NRC up to the point when a final decision is to be made on escalated enforcement. NRC Headquarters (ONRR) is usually involved in the escalated enforcement decision making process. However, Duke is not given the opportunity to express our views to, or to answer questions for, all the NRC individuals involved in the enforcement process. I am not sure NRC personnel can always present Duke's position to NRC management if and when misunderstandings develop following the Enforcement Conference.

I propose that a knowledgeable person from the Company be present during any future NRC pre-enforcement conference panels and at all meetings when a decision is being made on enforcement action. This individual would function as a source to clarify points of confusion and eliminate misunderstandings that develop while the NRC seeks to understand a particular issue.

I declare under penalty of perjury that the statements setforth herein are true and correct to the best of my knowledge.

Very Truly Yours,

Hal B. Tucker

Hal B. Tucker

viol.ltr/rgm

Attachment

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DUKE POWER COMPANY

ANSWER TO A NOTICE OF VIOLATION

50-413, 414/89-25

Duke Power Company admits that the violation occurred and that there were errors in judgement made relative to this event. However, Duke protests the imposition of the civil penalty and believes that it should be mitigated based upon the corrective actions taken by the Station. Catawba Nuclear Station believed that the Auxiliary Feedwater Pump Turbine (CAPT) was fully operable when it was returned to service on July 31, 1989. The Station still had concerns about the long term reliability of the CAPT, however, these concerns were not related to any immediate operability problem. Contrary to what is implied in the Notice of Violation and Imposition of Civil Penalty, the Station took prompt and aggressive action to fully understand the CAPT problems and to resolve the root cause of the valve stem corrosion when it was finally discovered. This attachment clarifies some of the activities which took place relative to this violation. Additional details of the corrective actions taken are listed in Attachment II, "Reply to a Notice of Violation".

The safe operation of the Catawba Nuclear Station is a responsibility that is taken very seriously by Duke Power personnel. Station management emphasizes Duke's commitment to safety in their day-to-day activities and decisions relating to nuclear plant operation. Under no circumstances would any of Duke's stations declare a safety related piece of equipment operable without a firm belief that their assessment of the situation was the correct one, and that the piece of equipment in question would function as necessary to fulfill its design bases. This is true in regards to the decisions made relative to the CAPT after it failed the initial operability surveillance test on July 31, 1989.

When the Maintenance Engineering Services (MES) Engineer was notified of the Auxiliary Feedwater Pump Turbine (CAPT) test failure, a visual inspection of the linkage was made to determine if any abnormal indications were present. There were none. Lubrication appeared to be sufficiently applied to the linkage and did not appear to be deteriorated or degraded in any manner. The MES Engineer and an Operations Engineer then observed an attempted pump start and visually noticed the failure of the linkage and valve stem to fully respond. The MES Engineer examined the linkage more closely, exercising the mechanism in the process to assess freedom of movement. The control valve linkage did move freely. Once again, no unusual indications were observed such as linkage bending, foreign debris, or lack of lubrication which would prevent the equipment from operating properly.

Another attempt to start the CAPT was made and the linkage responded properly to control turbine speed. The successful starting of the pump without an overspeed trip and the lack of any noticeable problems with the valve linkage led the Engineer to believe that the CAPT was now operating correctly. It was believed that whatever had caused the slow response of the linkage and valve stem previously, such as grit on the valve stem, the problem had corrected itself and the components were now responding properly.

It should be emphasized that the starting of the CAPT per the monthly periodic test was previously the accepted method for ascertaining pump operability. In this event the successful completion of the monthly surveillance test was used to further satisfy the personnel involved that the CAPT was capable of performing its safety function. The CAPT was subsequently declared operable and placed in service the same afternoon that the CAPT initially failed its test.

There were still questions unanswered as to what had previously caused the control valve linkage and valve stem to respond too slowly. Station personnel were also concerned over the susceptibility of the CAPT to having this happen again at some point in the future. This drove the station to aggressively pursue a thorough understanding of the event so that a method could be devised to detect or prevent its recurrence in the future.

On August 1, 1989, the MES Engineer met with Station management to discuss the events surrounding the CAPT from the previous day. The situation was evaluated to determine what additional steps should be taken to ensure the problem would not occur again. Operability of the CAPT was discussed and a decision was made that the Unit 2 Auxiliary Feedwater Pump Turbine continued to be operable. Once again this conclusion was based upon the approved method of determining CAPT operability at that time: the successful completion of the monthly surveillance test and the belief that whatever had caused the slow response of the control valve stem and linkage was corrected.

During these follow-up discussions with Station Management, past problems with the CAPT were reviewed taking into consideration the present design of the equipment, repair methods, procedures, and the types of lubricants used.

The failure histories of both the Unit 1 and 2 CAPTs revealed only two prior occurrences of excessive control valve stem drag problems. There was one occurrence on each Unit. The Unit 1 problem occurred in November of 1984 and was due to steam leakage from the control valve packing. The leaking steam caused the lubrication on the control valve linkage to be washed off, thereby affecting the control valve's ability to respond quickly enough to prevent turbine overspeed. The Unit 2 problem occurred in February 1988 and was the result of a "cocked" packing washer. The Unit 2 control valve was rebuilt in March 1989, during which time the control valve stem was replaced. The root causes of these two prior problems were different from what the Station now knows occurred during this recent event. Previous experience with these pumps did not, and should not, lead Station personnel to conclude that valve stem corrosion was the root cause of the recent CAPT inoperability.

At the conclusion of the discussions between the MES Engineer and Maintenance management, it was believed that the control valve linkage lubrication was the most likely root cause of the slow valve and linkage response time. A document search was initiated to determine the types of lubricants used on the CAPT as well as those recommended by the vendor. The equipment manufacturer was also contacted as part of the effort to fully resolve this issue. It was determined the following day that the lubricant presently being used on the CAPT linkage was not the recommended one. The Turbine manufacturer recommended that a dry film lubricant be used instead of the current paste lubricant. At this time the vendor also confirmed that the installed control valve and associated linkage were of the latest design. Based upon the number of previous successful

starts of the CAPTs on both Units, the linkage lubrication was not considered to be a short term operability issue requiring immediate resolution. Therefore, Work Requests were written to change the lubricant on both Unit CAPTs beginning on August 10, 1989, approximately one week later.

The NRC Resident Inspectors first became aware of the CAPT start failures on the day after the CAPT was returned to service. The issue was briefly discussed at the morning plant status meeting. On August 2, 1989, two days after the initial turbine start failures, the NRC Resident Inspectors were briefed on the status of Station efforts in this area. During this briefing, the immediate corrective actions taken were discussed as well as the efforts currently underway to follow-up on the issue. It was at this meeting that the Residents voiced their concerns relative to the operability of both Units' CAPTs. These concerns were based on the fact that the apparent root cause of the problem had been identified as being the wrong lubrication applied to the linkage.

A follow-up meeting was held with the Resident Inspectors the next day to further discuss their concerns and to alleviate the misunderstandings that the Station staff perceived the Residents had relative to this event. During this meeting the Residents were informed that a visual examination had been performed on the Unit 1 CAPT linkage with no abnormal indications observed as to degradation of the lubricant. The schedule dates for replacing the lubrication had also been moved forward from August 10, to August 6, 1989. The Residents asked if the Station had planned on performing pre-maintenance operability tests on the CAPTs. The Station had not considered doing this, but agreed that it was a good idea and subsequently decided to perform the tests to verify operability. At the conclusion of this meeting, the Station believed that the Resident Inspectors fully understood the thorough, programatic actions that were being taken to resolve the long term reliability concerns relative to the CAPT.

On August 6, 1989, a pre-maintenance test was performed on the Unit 1 CAPT. The CAPT was successfully tested, confirming the Stations' assumption that the lubrication was not an immediate operability concern. The Unit 1 CAPT control valve linkage was then disassembled, cleaned, lubricated, and reassembled. The turbine was retested and returned to service on August 7, 1989 after operability was confirmed. A pre-maintenance test was performed on the Unit 2 CAPT on Monday, August 7, 1989. The turbine tripped on electrical overspeed. It was observed that the control linkage moved too sluggishly to control turbine speed properly. The electrical overspeed trip was reset from the Control Room and the CAPT was started again within ten minutes of the original trip at which time it ran successfully. After securing the pump, linkage disassembly began and the control valve stem was observed to have excessive drag in the valve assembly. The work was expanded to include rebuilding the valve as well as re-lubrication of the linkage. After disassembly of the control valve, it was found that corrosion on the valve stem was preventing smooth travel through the packing area. Linkage wear was also discovered as a result of the excessive force required to move the stem with the corrosion present. The corrective maintenance work was completed, and on August 9, 1989, the Unit 2 CAPT was successfully tested and returned to service.

As can be seen from the events described above, the Station was concerned with establishing a definite root cause of the Unit 2 CAPT test failures. Although the CAPT was proven to be operable using the current operability criteria,

there was a clear recognition by the individuals involved that the condition of the pump did not meet the Stations' own high standards with regards to long term reliability. Efforts were taken right away to review the event with appropriate Station management. During this review, past problems were analyzed to determine if new conclusions could be drawn as to the CAPT start failures. When lubrication appeared to be a likely root cause of the event, this was assessed and a conscious decision was made that the CAPTs were operable. Work requests were written and a reasonable schedule was established for changing the linkage lubrication. The turbine manufacturer's service engineer was brought to the Station to assist with resolution of the problem. The Resident Inspectors were briefed on the incident and their comments were considered and addressed. The pre-maintenance test of the Unit 1 CAPT on August 5, 1989, proved the Stations' assessment that the use of the paste lubricant instead of the dry lubricant was not an immediate operability concern.

The actual root cause of the Unit 2 CAPT problem was discovered within seven days of the initiating event. When the root cause of the slow control valve response was determined to be stem corrosion, the corrective actions taken were unusually broad. Subsequent actions included the development and initiation of special test programs to collect critical data to assess CAPT operability. Additional investigations were conducted to determine industry experience with this type of corrosion problem. This included the NPRDS review as well as discussions with other utilities having this type of equipment. A special working group was formed to look at all aspects of Auxiliary Feedwater System. Additional maintenance activities were identified and initiated to ensure CAPT reliability. Station personnel were informed of the event and the lessons learned from it. The lessons learned pertained to the need to thoroughly evaluate and understand the root causes of equipment failures and to perform trouble shooting activities using the Work Request program.

The Notice of Violation and Proposed Imposition of Civil Penalty stated that the civil penalty was being issued to "emphasize the importance of aggressive problem resolution and conducting actions within established programs and procedures." Duke power believes aggressive action was taken in resolving this issue. Additionally, the CAPT was declared operable following the overspeed trip events using approved operability criteria in effect at that time. Duke Power admits that the violation occurred, and that errors in judgement were made. However, based upon a full understanding of the activities that transpired over the week in question, Duke believes full mitigation of the fine is warranted. This request for full mitigation is based upon Duke's aggressive actions that ultimately led to the discovery and full understanding of the valve stem corrosion phenomena, as well as the comprehensive corrective actions taken to resolve the problem.

It is Duke's perception that there was not a clear understanding by the NRC of all the activities that transpired during the first several days of this event or during the subsequent weeks. Duke believes that the NRC would have exercised discretion and refrained from proposing a civil penalty if there had not been a misunderstanding. Therefore, while the Region and Headquarters Staff review this response, Duke Power requests that any questions that arise be resolved by contacting the Licensee.

DUKE POWER COMPANY

REPLY TO A NOTICE OF VIOLATION

50-413, 414/89-25

Restatement Of The Violation

10 CFR Part 50, Appendix B, Criterion XVI requires that measures be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. The identification of the significant condition adverse to quality, the cause of the condition, and the corrective action taken shall be documented and reported to appropriate levels of management.

Technical Specification 6.8.1 requires that written procedures be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33 (RG 1.33) Revision 2, February 1978. Appendix A of RG 1.33 requires the establishment of administrative procedures for the conduct of safety-related activities and procedures for operation, maintenance, and testing, as appropriate to the circumstances.

The Administrative Policy Manual for Nuclear Stations, Section 3.3.2.3, established pursuant to RG 1.33, requires that maintenance be performed under the control of the Work Request System in accordance with written procedures which conform to applicable codes, standards, specifications and criteria. Section 3.3.2.5 requires that, in the event of an equipment failure, the cause shall be evaluated and equipment of the same type shall be evaluated to determine whether or not it can be expected to continue to function in an appropriate manner.

Station Directive 3.3.7, Work Request Preparation, established pursuant to RG 1.33, states that the Work Request is the basic document of the Maintenance Management Program for corrective and preventive maintenance and that employees requesting maintenance assistance are required to comply with the provisions of the program.

Maintenance Management Procedure 1.0, Work Request Preparation, established pursuant to RG 1.33, further defines Work Request requirements including authorization and definition of work to be performed, documentation of clearance to begin work, procedures to be used, description of maintenance activities performed, and documentation of retest activities and acceptance by operations.

Station Directive 3.2.2, Development and Conduct of the Periodic Test Program, Section 6.0, established pursuant to RG 1.33, requires that, for any reason a surveillance test fails to meet acceptance criteria, the Shift Supervisor shall ensure that the proper course of action for returning the equipment to operable status is pursued.

Station Directive 3.1.14, Operability Determination, established pursuant to RG 1.33, states that when responsible station personnel believe a component is operable but have concerns related to it, necessary actions shall be taken expeditiously to resolve the concerns, identify any root cause, and confirm operability. These actions shall include additional testing, engineering evaluations, and calculations or inspections, as appropriate to the circumstances. The directive further requires an "Operability Evaluation Form" to be completed to document the concern, the basis for the evaluation, and any alternate methods of compensatory measures needed to fulfill the component's safety function.

Contrary to the above, on July 31, 1989, the Turbine Driven Auxiliary Feedwater Pump (CAPT) failed a surveillance test on overspeed, and the root cause of the failure was not determined, nor was adequate corrective action taken to preclude repetition. After the CAPT failed the surveillance test the Shift Supervisor did not assure that the proper course of action was taken to return the equipment to operable status. The maintenance activities were not performed under the control of the Work Request System. Consequently, the root cause of the CAPT overspeed trip was not determined prior to returning it to service. This directly contributed to the CAPT trip on the subsequent surveillance test performed on August 7, 1989.

1. Admission Or Denial Of The Violation

Duke Power Company admits the violation.

2. Reasons For The Violation If Admitted

Duke Power classifies this event as an equipment failure based on the findings during the disassembly of the Unit 2 CAPT control valve on August 8, 1989. With the linkage removed, the parts used to guide the valve stem movement were found to be worn and the valve stem did not travel smoothly within the valve assembly. After disassembly of the control valve, Duke discovered that corrosion and pitting on the valve stem were preventing smooth travel through the packing area. Linkage wear was also discovered and was most likely the result of the excessive force required to move the stem.

Extensive investigations into the root cause of this event discovered that the valves which isolate Main Steam to the CAPT (2SA-2 and 2SA-5), have experienced seat leakage problems. This allowed condensate to collect in the CAPT control valve. The control valve stem leakoff drain line has a Kerotest Series 1500 T-Type Globe valve installed that can easily become clogged and not allow adequate draining of the condensate from the control valve stem. Additionally, the stem leakoff line was connected to the control valve bonnet with a horizontal orientation. With the stem leakoff drain connection horizontal, it was not allowing condensate to drain from the lower half of the stem.

The leaking steam supply valves, the drain connection orientation, and the type of drain line valve have all contributed to the corrosion and pitting of the control valve stem.

Duke now knows that the mechanical overspeed trip of the Unit 2 CAPT on July 31, 1989, is a direct result of the control valve stem corrosion discovered seven days later. After three mechanical overspeed trips on July 31, the control valve linkage was mechanically exercised to assess freedom of movement. The control valve stem then moved freely enough to achieve a successful start with the CAPT speed control set on minimum. On August 7, 1989, the turbine tripped on electrical overspeed when started with the speed control set on maximum, and then was successfully started with only a reset of the electrical trip mechanism.

When the CAPT is started, the control valve is fully open. The turbine speed increases rapidly until the control valve has shut sufficiently to control speed. The rate of speed increase and the rate of control valve closure is considered to be the same with the speed control set on minimum or maximum. Once the control valve is closed sufficiently, the speed of the turbine decreases and then adjusts to the control setting. All of the CAPT overspeed trips were on the initial speed increase of the turbine. The initial movement of the turbine and the increased temperature from the inlet steam during the first attempted start on August 7, 1989, decreased the friction between the control valve stem and packing enough for the second start attempt to be successful. The friction between the stem and packing was too great during the July 31, 1989 starts and manual exercising of the linkage was required to free or allow its movement.

The July 31, 1989, trips of the CAPT occurred during the monthly surveillance testing in accordance with PT/2/A/4250/06. The control valve linkage was manually exercised and the Unit 2 CAPT was successfully started, completing the surveillance test. A work request was not initiated to identify and document the action taken. Reviewing the requirements with the Performance Engineer, PT/2/A/4250/03C, Turbine Driven Auxiliary Feedwater Pump #2 Performance Test, is used to verify the Turbine Driven Auxiliary Feedwater Pump operating parameters on a quarterly basis and would not have been used to verify CAPT operability following work on the control valve or linkage. Completion of PT/2/A/4250/06, used to verify the CAPT discharge pressure at the rated flow rate and speed, met the post maintenance testing requirements on the CAPT.

A contributing cause of this event was the failure to initiate a work request when the Unit 2 CAPT tripped during surveillance test on July 31, 1989. Station Directive 3.2.2, Development and Conduct of the Periodic Testing Program, requires that a work request be generated to resolve discrepancies encountered during surveillance

testing. Without a work request, the normal process of evaluating equipment operability was not performed. Catawba Management philosophy expects that problem resolution be performed under the appropriate programs to ensure that underlying problems are identified and resolved, and that operationally reliable components are returned to service.

The operability of the Unit 2 CAPT during the seven day period in question is dependent upon the rate of stem corrosion and the impact this corrosion would have on the control valve stem. With this consideration, the actual operability of the Unit 2 CAPT between July 31 and August 7, 1989, cannot be determined. If the rate of corrosion was sufficient to cause the Unit 2 CAPT to be inoperable for the four days immediately after it passed its surveillance test, a Technical Specification violation would have occurred due to the Unit 2 Motor Driven CA Pump "B" being removed from service for repairs. If the corrosion developed such that turbine trip would not have occurred until after August 4, a violation would not have resulted. However, since the work was performed outside of the work request program, the pump is considered potentially inoperable during this period.

The CAPT control valve and linkage is an integral part of the Terry Steam Turbine, Model GS-2N, with a cam crank linkage. Review of the history of failures on both Unit 1 and Unit 2 CAPTs revealed two prior occurrences of excessive control valve stem drag problems. Stem drag was corrected by Work Request 129310PS on the Unit 1 CAPT in November, 1984, and by Work Request 5257MNT on the Unit 2 CAPT in February, 1988. The Unit 2 CAPT control valve was rebuilt in March, 1989, during the refueling outage at which time the stem was replaced. The details of these past two events did not lead Duke to conclude that valve stem corrosion was the cause of this event.

3. Corrective Actions Taken And Results Achieved

a. The Maintenance Engineering Services (MES) Engineer and the Operations Engineer observed the CAPT start on July 31, 1989. The linkage was visually inspected and manually exercised to assess freedom of movement. The CAPT was declared operable after successfully passing the surveillance test.

b. The MES Engineer met with Station management on August 1, 1989 to discuss the event and to review what additional steps should be taken to ensure long term CAPT reliability. The operability of the CAPT was discussed and a decision was made that the equipment was still operable.

c. A document search and discussions with the Turbine manufacturer were held on July 31, and August 1, 1989. These discussions determined that the paste lubricant currently being used on the linkage was not the recommended type. Work Requests were written on August 3, 1989, and a schedule developed for changing the linkage lubrication.

d. The Unit 1 CAPT linkage was disassembled, cleaned, relubricated and rebuilt under Work Request 1514MES on August 6, 1989. No problems with the control linkage or valve were observed.

e. The Unit 2 CAPT control valve and linkage were rebuilt on August 7, 1989 under Work Request 1515MES. The control valve stem and packing were replaced. The linkage was cleaned and relubricated. The CAPT was returned to service on August 9, 1989.

f. Catawba Station Manager Staff Notes of August 17, 1989, emphasized to all Station employees the need to thoroughly evaluate the root causes of failures, and provided a philosophy for performing root cause analyses.

g. A testing program was begun on both units to collect data and ensure CAPT operability. The following type of data was collected:

- Force required to close the CAPT control valve
- Timed starts of the CAPT
- Recorded and graphed "RPM versus Time" for fast starts of both Units' CAPTs.

h. An NPRDS review to find other stations with similar problems has been conducted. MES staff members discussed the event with Davis Besse and D. C. Cook personnel since these Stations have similar equipment.

i. The Station formed a working group to look at all aspects of the Auxiliary Feedwater System and the associated equipment. Some of the areas being looked at are:

- Procedure review (Maintenance procedures)
- Improving start-up characteristics of the CAPTs
- Material changes (stem, packing)
- Industry problem review
- Available training

j. Standing Work Requests (SWRs) have been written to inspect the CAPT control valves yearly during outages.

k. Bi-weekly tests of the Unit 2 CAPT have been conducted since the initial event. On Unit 2, since the overspeed trip on August 7, 1989, there had been no overspeed trips and the valve "pull" tests have indicated no increase in force (40-60 pounds) required for actuation. This indicates a lack of corrosion on the valve stem. The pump test and valve pull tests are now back on a monthly frequency. On Unit 1, the last overspeed trip occurred on October 30, 1989 and was due to drain orifices being clogged. The orifices are now being cleaned every two months.

l. A Standing Work Request has been initiated to disassemble the control valve and linkage to inspect parts for wear during each refueling outages on Units 1 and 2.

m. The CAPT control valve bonnets on both Units have been rotated and the in-line valve removed from the stem leakoff drain line to allow better drainage of the condensate from the control valve packing area.

n. PT/1(2)/A/4250/06 and OP/1(2)/6250/02 have been revised to allow starts of the CAPTs from the cold condition at maximum speed during post-maintenance testing.

The aggressive plant strategies and corrective actions taken have resulted in the identification and complete understanding of the root causes associated with the CAPT control valve stem corrosion problem.

4. Corrective Actions To Be Taken To Avoid Further Violations

a. The Control Valve Standing Work Requests and Maintenance Procedures are to be revised as follows:

- Establish an option for the lubricant to be used on a control valve linkage for either a paste lubricant (N5000) or a high temperature grease (molycoat) depending on the area of application. This is consistent with the vendor recommendations.

- Add a requirement to properly clean the linkage prior to applying the lubricant.

- Add steps to disconnect the servo valve from the valve linkage and check for freedom of movement in the valve stem. Lack of movement will require action to determine the cause.

b. The Unit 2 CAPT control valve will be disassembled and inspected to determine the rate at which pitting is occurring.

c. An SWR has been developed to change out strainers in the orifices associated with the existing drains in the steam supply line to the CAPTs. This work is currently being performed every two months.

d. The material used in construction of the control valve stem and packing has been evaluated. It has been determined that a more corrosive resistant material is desirable and has been requested from Dresser Rand. This is a long term reliability issue. Continued operability of the CAPTs is assured based upon the increased frequency of testing and inspections.

e. The Unit 1 and Unit 2 steam supply isolation valves (SA-2 and SA-5) will be replaced during the upcoming U1EOC4 and U2EOC3 refueling outages to prevent excessive steam leakage from the Main Steam supply to the CAPT control valve.

f. The Unit 1 CAPT governor valve was disassembled in September, 1989 to verify condition of the stem and will be disassembled again during the Unit 1EOC4 outage.

g. It will be reiterated with all appropriate personnel that troubleshooting activities shall not be performed without a work request on equipment that may have follow-up retest requirements.

5. Date When Full Compliance Will Be Achieved

The comprehensive actions taken to date and those planned for the future will continue to ensure the long term reliability of the CAPTs. CAPT control valve stem corrosion no longer presents an operability concern due to the extensive monitoring and testing that has been implemented.

Full compliance with the corrective actions planned is targeted for the Unit 1 and 2 refueling outages 1EOC5 and 2EOC4, respectively. The factor which extends this date is the time for obtaining the new valve stems and the available outage dates to install them (see item 4.d.).

DUKE POWER COMPANY

REPLY TO A NOTICE OF VIOLATION

50-413, 414/89-25
Section II, Violation A

Restatement Of The Violation

Technical Specification (TS) 3.7.1.2 requires at least three independent Steam Generator Auxiliary Feedwater pumps and associated flow paths be operable in Modes 1, 2 and 3. With three Auxiliary Feedwater pumps inoperable, immediate corrective action to restore at least one Auxiliary Feedwater pump to operable status as soon as possible must be taken.

Contrary to the above, on September 12, 1989, with Unit 2 in Mode 1, the associated flow path for all three Auxiliary Feedwater pumps were inoperable for a period of about 35 minutes, and immediate corrective action was not taken.

1. Admission or Denial of the Violation

   Duke Power Company admits the violation.

2. Reasons for the Violation if Admitted

   a. The Operator took inappropriate action in removing the switches from "AUTO" and placing them in the "CLOSED" position without realizing the consequences of this action. The consequences were not clearly understood at the time of the incident due to the Operators concern over lake water contamination of the Auxiliary Feedwater System (CA). This concern, coupled with the inadequate procedure resulted in the operator failing to immediately identify the inoperability.

   b. The "1.47 Bypass Panel" (installed in accordance with Regulatory Guide 1.47) did not audibly alarm and thereby alert the Operator that placing the control board switches in the "CLOSE" position made all three Auxiliary Feedwater Pumps inoperable.

   c. The Operator did not immediately recognize that the alarm lights present on the "1.47 Bypass Panel" were abnormal. Some combination of alarm lights were to be expected because the systems were not in their normal alignment due to the pipe flushing evolution underway.

   d. The "1.47 Bypass Panel" utilizes numerous inputs to determine if a particular system is inoperable (valve positions, electrical breaker positions, etc.). To evaluate the component or system configuration that has initiated a "1.47 Bypass Panel" alarm, the Operators usually rely on the Shift Managers to look at remote electrical relay status and compare this to

electrical logic drawings. The Operator attemped to contact the Shift Manager via telephone to help determine why the alarm lights were illuminated, but was unable to reach him. The Operator did not page the Shift Manager or utilize another person to assist in the alarm determination because the Operator did not recognize the alarms as being abnormal and requiring immediate attention.

3. Corrective Actions Taken and Results Achieved

a. The Operator returned the "CLOSE-AUTO-OPEN" switches to "AUTO". This enabled the automatic swapover feature of the Auxiliary Feedwater System which aligns suction to the assured source (Nuclear Service Water) if the normal source of condensate is lost.

b. The individual involved in this incident has been counselled on the need to notify the Control Room Supervisor of abnormal conditions and the need to initiate prompt follow-up action for alarms on the "1.47 bypass panel."

c. An "Operator Update" (training package) was immediately issued for all licensed Operators discussing this event. The following issues were emphasized: 1) the purpose of the "AUTO" position of these particular switches; 2) the importance of considering the consequences of procedure steps prior to performing them; and 3) the importance of taking prompt action in response to determining and correcting the cause of "1.47 Bypass Panel" alarms.

d. An Operator Update was subsequently issued to all licensed Operators to reinforce the requirements of Operations Management Procedure (OMP) 1-8 that the Operator at the Controls (OATC) shall: 1) ensure that the Control Room Supervisor is notified of all abnormal conditions; and 2) ensure that the appropriate action is taken for all alarms.

The corrective actions resulted in the appropriate number of Auxiliary Feedwater Pumps being returned to operable status. The Operators' knowledge has been reinforced as to the lessons learned from this event.

4. Corrective Actions to be Taken to Avoid Further Violations

The corrective actions taken in Section 3 are sufficient to ensure that further violations of a similar nature are avoided.

5. Date of Full Compliance

Duke Power Company is now in full compliance.

DUKE POWER COMPANY

REPLY TO A NOTICE OF VIOLATION

50-413, 414/89-25
Section II, Violation B

Restatement Of The Violation

Technical Specification (TS) 6.8.1. requires that written procedures be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33 (RG 1.33), Revision 2, February 1978. Appendix A of RG 1.33 requires the establishment of procedures covering operation, maintenance, and testing, as appropriate to the circumstances.

Contrary to the above:

1. Performance Test PT/2/A/4200/59, Nuclear Service Water (RN) to Auxiliary Feedwater (CA) Piping Flush, which was written to implement the requirements of RG 1.33, was inadequate in that Step 12.2.6 requires the operator to "Ensure the following valves are closed: 2CA-15 and 2CA-18;" however, the procedure failed to require the operator to ensure that the control board switches for the valves remained in the AUTO position. This contributed to the operator incorrectly placing the switches in the CLOSE position on September 12, 1989, with Unit 2 in Mode 1.

2. Operations Management Procedure 1-8, Authority and Responsibility of Licensed Reactor Operators and Licensed Senior Reactor Operators, which was written to implement the requirements of RG 1.33, requires the Operator At The Controls (OATC) to ensure the Control Room Supervisor is notified of all abnormal conditions and to ensure that appropriate followup action is taken for all alarms. This procedure was not implemented. Specifically, on September 12, 1989, the OATC, after having observed the "CA Train A Bypassed" and "CA Train B Bypassed" alarms illuminated on the 1.47 Bypass Panel, failed to notify the Control Room Supervisor of the alarms and failed to initiate prompt followup action.

3. Operating Procedure OP/2/B/6100/07E, Annunciator Response For 1.47 Bypass Panel, which was written to implement the requirements of RG 1.33 requires the exact cause of each light illuminated on the panel to be determined and the verification that any equipment required to be operable by Technical Specifications and causing an alarm is operable or is properly declared inoperable. This procedure was not adequately implemented. Specifically, on September 12, 1989, the OATC failed to determine the cause of the light on the 1.47 Bypass Panel or to verify that the motor driven CA pumps causing the alarm were inoperable, or properly declared inoperable, until prompted by the NRC.

1. Admission or Denial of Violation

Duke Power Company admits the violation.

2. Reasons for Violation if Admitted

a. The procedure which controlled the piping flush evolution was written so that it could be performed with the Auxiliary Feedwater System (CA) in the Standby Readiness alignment (Modes 1-3) or from a non-standby readiness condition (Modes 4-6). The procedure step which required the Operator to ensure the assured suction source isolation valves were closed addressed the possibility that these valves could, therefore, be in the open position. The thought that the Operator could possibly misinterpret this step when the CA system was aligned for standby readiness and render the CA system inoperable did not occur to the procedure writer or reviewers. The intent of this particular step in the procedure was not clear.

b. The "1.47 Bypass Panel" (installed in accordance with Regulatory Guide 1.47) did not audibly alarm and thereby alert the Operator that placing the control board switches in the "CLOSE" position made all three Auxiliary Feedwater Pumps inoperable.

c. The Operator did not immediately recognize that the alarm lights present on the "1.47 Bypass Panel" were abnormal. Some combination of alarm lights were to be expected because the systems were not in their normal alignment due to the pipe flushing evolution underway.

d. The "1.47 Bypass Panel" utilizes numerous inputs to determine if a particular system is inoperable (valve positions, electrical breaker positions, etc.). To evaluate the component or system configuration that has initiated a "1.47 Bypass Panel" alarm, the Operators usually rely in the Shift Managers to look at remote electrical relay status and compare this to electrical logic drawings. The Operator attempted to contact the Shift Manager via telephone to help determine why the alarm lights were illuminated, but was unable to reach him. The Operator did not page the Shift Manager or utilize another person to assist in the alarm determination because the Operator did not recognize the alarms as being abnormal and requiring immediate attention.

3. Corrective Actions Taken and the Results Achieved

a. The procedures utilized to perform the pipe flushing evolution were revised to clarify the intent of the step which contributed to this event.

b. A review was conducted of other Operations' procedures. It was determined that the potential for similar problems existed in two other procedures. Procedure changes were subsequently implemented.

c. A work request was written and the audible alarm volume was turned up on the "1.47 Bypass Panel."

d. The individual involved in this incident has been counselled on the need to notify the Control Room Supervisor of abnormal conditions, and the need to initiate prompt follow-up action for alarms on the "1.47 Bypass Panel".

e. An "Operator Update" (training package) was immediately issued for all licensed Operators discussing this event. the following issues were emphasized: 1) the purpose of the "AUTO" position of these particular switches; 2) the importance of considering the consequences of procedure steps Prior to performing them; and 3) the importance of taking prompt action in response to determining and correcting the cause of "1.47 Bypass Panel" alarms.

f. An Operator Update was subsequently issued to all licensed Operators to reinforce the requirements of Operations Management Procedure (OMP) 1-8 that the Operator at the Controls (OATC) shall: 1) ensure that the Control Room Supervisor is notified of all abnormal conditions; and 2) ensure that the appropriate action is taken for all alarms.

g. A Station Problem Report has been written to evaluate the "1.47 Bypass Panel" and to investigate methods to assist the Operator in understanding the root cause of "1.47 Bypass Panel" alarms.

The procedure revisions and heightened awareness by the Operators will ensure that the Auxiliary Feedwater Pumps, as well as other systems susceptible to the same type of error, are not made inoperable due to the mispositioning of control board switches.

4. Corrective Actions to be Taken to Avoid Further Violations

Operator training is being provided to emphasize that placing the "CLOSE-AUTO-OPEN" switches for the CA valves in question to the "CLOSE" position renders CA inoperable. Emphasis is also being placed on the notification of Control Room supervision if equipment is made inoperable during the performance of a procedure.

5. Date of Full Compliance

Duke Power Company will be in full compliance by April 30, 1990. By this date all the Operators will have received additional training on this event in License Requalification Training.