



**Commonwealth Edison**

One First National Plaza, Chicago, Illinois  
Address Reply to: Post Office Box 767  
Chicago, Illinois 60690 - 0767

January 16, 1990

Mr. A. Bert Davis  
Regional Administrator  
U.S. Nuclear Regulatory Commission  
Region III  
799 Roosevelt Road  
Glen Ellyn, IL 60137

Subject: Quad Cities Station Units 1 and 2  
Response to Notice of Violation  
Contained in Inspection Report Nos.  
IR 50-254/89017 and 50-265/89017  
NRC Docket Nos. 50-254 and 50-265

Reference: Letter from H.J. Miller to Cordell Reed  
dated November 28, 1989 transmitting IR Nos.  
50-254/89017 and 50-265/89017.

Mr. Davis:

The referenced letter transmitted the results of the Maintenance Team Inspection which included two (2) Notices of Violation (NOV). Attachment A to this letter provides Commonwealth Edison Company's (CECo) response to the subject Notices of Violation. The NOV cited examples in which personnel did not follow procedure, inadequate procedures, and failure to implement appropriate corrective actions. CECo understands the significance of the issues involved and the need for effective corrective actions to prevent recurrence.

Attachment B provides an overview of significant improvement programs which are currently underway at Quad Cities Station. CECo appreciates the NRC's efforts in their review of the Quad Cities Maintenance Program and the goal of these programs relate directly to strengthening the Quad Cities Maintenance Program. A request for extension was requested and subsequently granted by F. Jablonski of your office.

0504T:1

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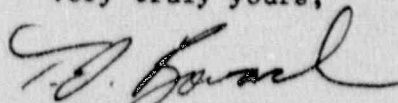
A.B. Davis

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January 16, 1990

If there are any questions or comments regarding this matter, please contact this office.

Very truly yours,



T.J. Kovach  
Nuclear Licensing Manager

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Attachment

cc: T.M. Ross - Project Manager, NRR  
J.M. Hinds - Region III  
R.L. Higgins - Senior Resident Inspector, Quad Cities  
F.J. Jablonski - Region III  
J.H. Neisler - Region III

0531T:2

ATTACHMENT A

RESPONSE TO NOTICE OF VIOLATION  
IR 50-254/89017; 50-265/89017

1. 10 CFR 50, Appendix B, Criterion V, as described in Section 5 of Topical Report CE-1A, Revision 55, and as implemented by Quality Assurance Manual, Section 5, requires that activities affecting quality be prescribed by documented instructions, procedures, and drawings, and that those activities be accomplished in accordance with those instructions, procedures and drawings. Criterion V further requires that Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

Contrary to the above:

- a. The licensee failed to follow the acceptance criteria of Quad Cities Nuclear Station Work Procedure NSWP-E-01, "Electrical Cable Installation and Inspection," Revision 1, for calculating the maximum allowable pull tension of electrical cables. This procedure, based on the vendor cable pulling criteria, stated that the maximum pulls shall not exceed either the maximum pull tension or a tension to be calculated on the basis of the sidewall pressure factor and the radius of the conduit bend. This resulted in a contractor specifying higher than allowable pull tensions in two work packages.

Work Package Q 69856 specified a maximum cable pull of 3165 lbs. instead of 467lbs.; Work Package Q 69854 specified a maximum cable pull of 7000 lbs. instead of 1558 lbs. This did not result in any cable pulls in excess of the revised allowable cable pulls in these two cases. The vendor's formula for calculating maximum allowable cable pulls was not utilized for most of the licensee's cable pulls made during plant outages in 1987 and 1988. The licensee was asked to investigate these cable pulls to verify acceptability of pulls to verify acceptability of pull tension and to take corrective actions as necessary.

- b. Quad Cities Procedure QMMS 6600-1-S4, "Diesel Inspection - Refueling Outage Checklist," Revision 2, did not include the acceptance criteria for the diesel overspeed trip test. The checklist, which was used for the tests on Unit 1/2 (common) on May 7, 1988, and on Unit 2 on June 9, 1988 had no provision to document the as-found overspeed trip setting of the diesels. As a result, the as-found trip settings on some previous tests could not be verified.
- c. Quad Cities Procedure QOS 2300-7, "HPCI Turbine Overspeed Test," Revision 3, did not include an acceptance criteria for the overspeed trip test. As the overspeed trip test results could not be verified for several years of operation prior to 1986, it was not evident whether the test results were within the acceptable limits.

- d. Quad Cities Procedure QOS 2300-7, "HPCI Turbine Overspeed Test," Revision 3 had no provisions to document either the as-found overspeed trip setting of the HPCI turbine or dates and signatures by the QC/QA inspector and test engineer. As-found trip settings could not be traced for tests conducted prior to 1986 and the results of tests conducted between 1987 and 1989 could only be obtained from the operators logs.

This is a Severity Level IV Violation.

EXAMPLE (a)

The licensee failed to follow the acceptance criteria of Quad Cities Nuclear Station Work Procedure NSWP-E-01, "Electrical Cable Installation and Inspection," Revision 1, for calculating the maximum allowable pull tension of electrical cables. This procedure, based on the vendor cable pulling criteria, stated that the maximum pulls shall not exceed either the maximum pull tension or a tension to be calculated on the basis of the sidewall pressure factor and the radius of the conduit bend. This resulted in a contractor specifying higher than allowable pull tensions in two work packages.

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ACTIONS TAKEN TO CORRECT THE DEFICIENCY

1. A review was performed on all work requests which involved cable pulls through conduit during the Unit 1 Refueling Outage to ensure that the maximum pull tension was properly calculated. The review was accomplished during utilizing NSWP-E-01, Electrical Cable Installation and Inspection, Revision 1. The review revealed that work requests contained the accurate maximum allowable pull tensions, i.e., the maximum copper tension and not the sidewall pressure, with the exception of two cases. Work Requests Q69856 and Q68954 were revised to reflect the sidewall pressure as the limiting maximum pull tension. The activities associated with these work requests had not been initiated upon discovery of the discrepancy.

2. A training session was conducted with the Stone & Webster electrical work planners. The training session reviewed the requirements of NSWP-E-01 and stressed the importance of determining the limiting pull tension requirement. This training session was conducted on November 11, 1989.

CORRECTIVE ACTIONS TO PREVENT FURTHER NONCOMPLIANCE

1. A revision to NSWP-E-01, Electrical Cable Installation Inspection, will be performed to enhance the human factor aspect of the procedure and checklist. A cable maximum pulling tension/sidewall pressure form will be implemented to ensure that the maximum pull tension and sidewall pressure information is documented and readily available. This revision should assure that the importance of sidewall pressure in calculating the maximum cable pull tension. This procedure revision will be accomplished by June 15, 1990.

In the interim, Stone and Webster will document the maximum pull tension/sidewall pressure values on a Work Package Supplement Sheet. The requirement to review the sidewall pressure was not readily identifiable in the procedure and the required form, thereby, allowing for the requirement to be overlooked.

2. Procedure QEMP 700-1 will be revised to incorporate the references of Electrical Installation Specification NC 0008 and NSWP-E-01. This will ensure that sidewall pressure and maximum pull tension will be calculated. The procedure will be implemented by January 31, 1990.
3. Finally, an engineering evaluation will be conducted on all electrical cable pulls performed after January 1, 1987. The evaluation will be performed, as follows:
  - a. Work requests and modifications involving cable pulls within conduit will be identified by February 28, 1990.
  - b. A data base will be established for each identified cable pull consisting of the following information:
    - Cable ID Number
    - Cable Size and No. of Conductors
    - Number of Other Cables Pulled
    - Cable size and No. of Conductors for Other Cables
    - Machine or Manual Pull
    - Degree of Bend
    - Conduit Size and Type

The data base will be implemented for Unit 2 cables by April 30, 1990, and for Unit 1 cables by December 31, 1990. The completion dates were determined based on current Outage schedule.

- c. For each conduit cable pull, an evaluation will be performed to determine if the cable pull is acceptable based on the available documentation and current procedures and standards, including both pulling load and sidewall pressure considerations. The evaluation will be completed on June 30, 1990 for Unit 2 and February 28, 1991 for Unit 1.
- d. A final evaluation report will be issued on April 30, 1991.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Full compliance was achieved on November 11, 1989 following the completion of work analyst training.

EXAMPLE (b)

Quad Cities Procedure QMMS 6600-1-S4, "Diesel Inspection - Refueling Outage Checklist," Revision 2, did not include the acceptance criteria for the diesel overspeed trip test. The checklist, which was used for the tests on Unit 1/2 (common) on May 7, 1988, and on Unit 2 on June 9, 1988 had no provision to document the as-found overspeed trip setting of the diesels. As a result, the as-found trip settings on some previous tests could not be verified.

DISCUSSION

Procedure QMMS-6600-1-S4 required that the Test Director review the acceptance criteria specified in the Vendor Equipment Technical Information manual to assure satisfactory completion of the test. The Test Director would indicate this verification by his/her initials on QMMS-6600-1-S4, Diesel Inspection Refueling Outage Checklist.

Quad Cities Station concurs that the acceptance criteria for the diesel generator overspeed trip should be included in the procedure to enhance human factor usability. Also, the speed at which the diesel overspeed trip occurred should be documented on the checklist.

ACTIONS TAKEN TO CORRECT THE DEFICIENCY

Quad Cities Procedure QMMS-6600-1-S4 has been revised to include acceptance criteria for the diesel generator overspeed trip and the requirement to document the speed at which the overspeed trip occurred. The procedure revision was implemented in September, 1989.

CORRECTIVE ACTIONS TAKEN TO PREVENT FURTHER NONCOMPLIANCE

The surveillance procedures for the diesel generator will be reviewed to ensure that acceptance criteria is included in the procedure and that as found conditions be documented. The review of the surveillance procedures will be completed by April 30, 1990. Based on the results of the review, procedure revisions will be implemented, as required. Procedure revisions will be completed by October 31, 1990.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Full compliance was achieved in September, 1989 with the implementation of the procedure revision to QMMS-6600-1-S4.

EXAMPLES (c) and (d)

Quad Cities Procedure QOS 2300-7, "HPCI Turbine Overspeed Test," Revision 3, did not include an acceptance criteria for the overspeed trip test. As the overspeed trip test results could not be verified for several years of operation prior to 1986, it was not evident whether the test results were within the acceptable limits.

Quad Cities Procedure QOS 2300-7, "HPCI Turbine Overspeed Test," Revision 3 had no provisions to document either the as-found overspeed trip setting of the HPCI turbine or dates and signatures by the QC/QA inspector and test engineer. As-found trip settings could not be traced for tests conducted prior to 1986 and the results of tests conducted between 1987 and 1989 could only be obtained from the operators logs.

DISCUSSION

Quad Cities acknowledges that Procedure QOS 2300-7, "HPCI Turbine Overspeed Test" does not include the acceptance criteria for the HPCI turbine overspeed trip or require that actual speed be documented.

As indicated in Example (d), there is no provisions in the procedure for the signature of the QC/QA Inspector or Test Engineer. Neither Quality Assurance nor Quality Control are required to witness the conduct of every HPCI Turbine Overspeed Test and, therefore, no permanent space in the procedure is provided. Quality Assurance and Quality Control are required to review safety-related and regulatory-related work requests. During the review of these work requests, the reviewer determines whether a QA/QC Hold or Witness Point is appropriate. The Hold or Witness Point is incorporated into the work package and a line is drawn for the appropriate signature. The completed surveillance procedure reviewed by the NRC Inspector was contained in a work package and Quality Assurance inserted a hold point, however, omitted to draw a line to provide for signature.

ACTION TAKEN TO CORRECT THE DEFICIENCY

A revision to procedure QOS 2300-7, HPCI Turbine Overspeed Test, has been implemented to incorporate the acceptance criteria for the the HPCI turbine overspeed trip and to record the as-found trip setting. The procedure was revised and issued in November, 1989. The procedure will be further revised to include provisions for the Test Engineers signature by January 15, 1990.

CORRECTIVE ACTIONS TAKEN TO PREVENT FURTHER NONCOMPLIANCE

Surveillance procedures for the HPCI system will be reviewed to ensure that acceptance criteria is defined, appropriate signature blocks are provided and as found conditions are documented. The review of the procedures will be completed on April 30, 1990. Based on the review results, procedure revisions will be implemented by October 31, 1990.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Full compliance will be achieved on January 15, 1990, when the procedure will be revised to include appropriate signature blocks.



2. 10 CFR 50, Appendix B, Criterion XVI, as described in Topical Report CE-1A, Revision 55, and as implemented by Quality Assurance Manual, Section 16, requires that measures be established to assure conditions adverse to quality 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 actions taken to preclude repetition, and that the significant conditions adverse to quality, the causes of the condition, and the corrective actions taken are documented and reported to appropriate levels of management.

Contrary to the above:

- a. The licensee failed to document and evaluate non-conforming conditions regarding the installation of oversized fuses during and prior to this inspection, in spite of having resolved an Action Item Request on this subject in 1988 committing to document and evaluate fuse size discrepancies when identified. Thus, the causes of the nonconforming conditions were not identified and corrective action to preclude recurrence was not implemented.
- b. The licensee failed to take adequate corrective action to implement vendor recommended preventive maintenance to inspect, lubricate, and exercise the RCIC turbine trip valve and linkage even after the subject turbine tripped several times on overspeed in 1986 due to the linkage being out of adjustment.

This is a Severity Level IV Violation.

#### EXAMPLE (a)

The licensee failed to document and evaluate non-conforming conditions regarding the installation of oversized fuses during and prior to this inspection, in spite of having resolved an Action Item Request on this subject in 1988 committing to document and evaluate fuse size discrepancies when identified. Thus, the causes of the nonconforming conditions were not identified and corrective action to preclude recurrence was not implemented.

#### DISCUSSION

During the Maintenance Team Inspection, the team discovered that a 15 amp fuse had been placed in a RPS circuit in panel 901-15 which required a 5 amp fuse. When the discrepancy was discovered, the 15 amp fuse was removed and replaced by a 5 amp fuse as required by drawing 4E-1503A, revision AC.

The Technical Staff performed an evaluation of the discrepancy and determined that circuit protection was acceptable on September 21, 1989. On October 5, 1989, Discrepancy Record (DR) 89-3461 was initiated to document the incorrectly sized fuse in panel 901-15.

Action Item Request (AIR) 88-37 has not yet been resolved. Monthly follow-ups are still being conducted to document the status of the issue resolution.

#### ACTION TAKEN TO CORRECT THE DISCREPANCY

The 15 amp fuse was replaced with the required 5 amp fuse. The Tech Staff evaluation concluded that adequate protection was provided for the circuit. A Discrepancy Report was initiated and an evaluation was performed.

#### CORRECTIVE ACTION TAKEN TO PREVENT FURTHER NONCOMPLIANCE

A review to ensure that properly sized fuses are contained in the Control Room and Auxiliary Electric Room panels has been initiated. Accessible fuses with readily identifiable fuse sizes have been verified in the Control Room and Auxiliary Electric Room panels. In order to verify the sizes of the remaining fuses, jumpers will have to be installed and, therefore, the remaining fuse sizes will be verified during the 1990 Unit 1 Refueling Outage and the 1991 Unit 2 Refueling Outage. Discrepancies found during this verification will be documented on a Discrepancy Record to ensure that appropriate Engineering Evaluation is provided.

#### DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Full compliance was achieved on October 5, 1989, with the issuance of the Discrepancy Record.

#### EXAMPLE (b)

The licensee failed to take adequate corrective action to implement vendor recommended preventive maintenance to inspect, lubricate, and exercise the RCIC turbine trip valve and linkage even after the subject turbine tripped several times on overspeed in 1986 due to the linkage being out of adjustment.

#### DISCUSSION

The trip/throttle (T&T) valve automatically trips shut on a turbine overspeed and can also be used to throttle steam flow to control turbine speed upon failure of the turbine governor. Per the vendor manual for the Reactor Core Isolation Cooling (RCIC) turbine T&T valve, the T&T valve is recommended to be cycled, one-quarter close and opened, once per week.

This weekly exercise is intended to demonstrate that the valve stem is not binding thereby preventing valve movement. This type of binding is most likely to occur after prolonged operation of the turbine or exposure to high temperatures which could cause thermal binding of the stem or a breakdown of the lubricant. The RCIC turbine at Quad Cities Station is not normally operated for prolonged periods. It is exposed to high temperatures (steam) once per month during normal operability testing which takes approximately 30 minutes. This operation does not expose the T&T valve to any severe stress which could cause binding. Based upon system operation, therefore, a weekly test is not necessary to assure operability of this valve.

The T&T valve is tested and lubricated once per cycle during overspeed testing of the RCIC turbine. This test assures operation of the valve under actual operating conditions. The valve is used to throttle steam flow to slowly increase turbine speed to the overspeed trip setpoint and then trip closed, under steam flow, when the overspeed setpoint is reached. There has been no problems of binding of the T&T valve during any of the overspeed trip tests or at any other time, therefore, additional testing is not necessary.

#### ACTION TAKEN TO CORRECT THE DEFICIENCY

Quad Cities Station will contact the vendor representative for the RCIC turbine and inform them of our deviation from their recommendations. With their concurrence the VETI Manual for the RCIC turbine and applicable station procedures will be revised to reflect the recommendations of INPO SOER 89-1. This SOER requires that the station conduct overspeed trip mechanism freedom of movement testing. The manual trip of the stop or trip and throttle valve of the steam turbine should be tested after each scheduled turbine/pump surveillance at a maximum interval of quarterly (as recommended by Dresser-Rand) and as needed for post-maintenance testing. This test verifies free movement of the trip device and tappet assembly, the stop or trip and throttle valve, and any associated linkages to the trip device. The revision to the Vendor Manual will be completed by March 30, 1990.

CORRECTIVE ACTIONS TAKEN TO PREVENT FURTHER NONCOMPLIANCE

No additional corrective actions are necessary.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Not applicable

## ATTACHMENT B

### IMPROVEMENT PROGRAM OVERVIEW

Quad Cities Station appreciates the NRC's efforts in the evaluation of the Quad Cities Maintenance Program. The report provided a beneficial review of our progress in strengthening our Maintenance Program since the NRC's last review of our Maintenance Program in April-June, 1988. The report will assist the Station in the continuing efforts to define and devote resources to weak areas.

Quad Cities Station acknowledges the weaknesses identified by the NRC Maintenance Team Inspection. Overall, the weaknesses are consistent with those identified by our own self-assessment activities. Quad Cities, in response to NRC Inspection activities and our self-assessment activities, is in the process of implementing several major efforts to improve areas which do not meet the performance expectations defined by the Station and Corporate Office. The following provides a brief synopsis of major activities underway at the Station:

- The Technical Staff will continue to increase in 1990. The current budget provides for a Technical Staff expansion from 54 to 68 engineers; however, the staffing increases must be implemented in a controlled manner to allow for effective training and to minimize the burden upon the current staff in their assistance of the new engineers. As an interim measure, the Technical Staff will be augmented by experienced, General Electric System Engineers. The contracted engineers will assist in the System Engineer Program development by providing technical guidance and knowledge to the current staff. The increase in staff should decrease the number of systems assigned to each engineer, thereby, allowing for more focused overview of each system.
- The Technical Staff is currently developing an equipment performance trending program. This program will require periodic review and trending of key equipment performance data. Corrective action plans will be required to be developed by the Technical Staff for system performance deficiencies, if required.
- The time frame to conduct Quality Assurance audits has been increased from 5 to 10 days in response to previous NRC concerns. The revised time frame should provide for a more effective investigation of the areas audited. The provisions to extend the time frame of the audit to more than 10 days, due to the scope or complexity of the audit, will remain in place. In addition, the Site Quality Assurance Group has consolidated the audit schedule to prevent duplication of effort and provide better definition of audit scope.

- Quad Cities Station has developed a new, comprehensive root cause analysis program in order to better identify problems, provide more thorough and effective corrective actions and formalize systems currently in place. The program will also define the standard of training in root cause analysis. This program will encompass the existing programs. The new program will be implemented by March 31, 1990.
- A major procedure upgrade program continues to be implemented. The upgrade program will identify procedure weaknesses similar to those identified by the Maintenance Team Inspection. Several milestones, including the development of the Writer's Guide, have been achieved. The 1990 Goals for the Procedure Rewrite Program have been defined based on the procedure's impact to plant safety. Approximately 4300 procedures are anticipated to be rewritten by 1996.
- Improvements in the Control of Contractors have been implemented at Quad Cities. Station and Engineering and Construction (ENC) will provide augmented overview of contractor activities to assure good work practices are demonstrated by the contractors. Additional corrective actions have been discussed with the NRC Staff during Management Meetings conducted on November 9, 1989 and January 11, 1990.

These programs, in conjunction with the implementation of the Conduct of Maintenance, will strengthen our Maintenance Program and Plant Operations. Quad Cities Station will continue to aggressively pursue the completion of these programs in support of our goal to achieve excellence.