



**Commonwealth Edison**  
Byron Nuclear Station  
4450 North German Church Road  
Byron, Illinois 61010

August 1, 1994

U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Attention: Document Control Desk

Subject: Byron Nuclear Power Station Units 1 and 2  
Response to Notice of Violation Inspection  
Report Nos. 50-454/94010; 50-455/94010  
NRC Docket Numbers 50-454, 50-455

Reference: Mark A. Ring letter to Mr. Graesser dated  
July 1, 1994, transmitting NRC Inspection  
Report 50-454/94010; 50-455/94010

Enclosed is Commonwealth Edison Company's responses to the Notice of Violation (NOV) which was transmitted with the referenced letter and Inspection Report. The NOV cited three Severity Level IV violations requiring a written response. CECO's responses are provided in the attachments.

If your staff has any questions or comments concerning this letter, please refer them to Don Brindle, Regulatory Assurance Supervisor, at (815)234-5441 ext.2280.

Respectfully,

K. Graesser  
Site Vice President  
Byron Nuclear Power Station

Attachments

cc: J. B. Martin, NRC Regional Administrator - RIII  
G. F. Dick, Byron Project Manager - NRR  
H. Peterson, Senior Resident Inspector, Byron  
B. L. Jorgensen, Reactor Projects Chief - RIII  
D. L. Farrar, Nuclear Regulatory Services Manager, Downers Grove

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**ATTACHMENT A  
RESPONSE TO NOTICE OF VIOLATION  
INSPECTION REPORT 454/94010;455/94010**

**VIOLATION (454(455)/94010-02)**

1. 10 CFR 50, Appendix B, Criterion XVI, states, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies 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.

Contrary to the above, as of May 23, 1994, corrective actions to address design deficiencies identified in September of 1990 (minimal design margin) with 16 auxiliary feedwater to steam generator isolation valves (AF-013s) were not prompt and the cause of the September 1993 failures (unknown degradation) was not determined or corrected.

This is a Severity Level IV violation (Supplement 1)

**REASON FOR THE VIOLATION:**

An operability concern was identified in September 1990 concerning the ability of the AF013 valves to close against the maximum differential pressure during accident conditions. Minor changes (gear ratio change, torque switch setting change and springpack change) were completed to increase margin on Unit 2 in October 1990 and on Unit 1 in October 1991. Additionally, differential pressure testing was successfully completed on Unit 2 in October 1990 and on Unit 1 in October 1991. Evaluation of margin in February 1992 concluded margin existed for both nominal and reduced voltage conditions. Options for adding additional margin or eliminating the need for additional stem/stem nut lubrication and cleaning on a refueling outage frequency were proposed in February 1992. Byron was not satisfied with the level of margin and further enhancements were pursued. These included major design changes such as larger cable and actuator/motor, replacement of valve internals and complete replacement of the valves. These options were evaluated for gain of margin, installation requirements, cost, and industry operating and maintenance experience. A recommendation to replace the valves was submitted in November 1993. The proposal to replace the valves was evaluated and concerns were identified with the proposed valve due to affect on flow balance. Solutions to the flow balance concern were developed and presented in April 1994. A decision was made to summarize all options for further review based on this presentation. Additional options of changing the valve from torque to limit control and reversing valve direction were presented in May 1994. It was decided in June 1994 to proceed with a modification to change the control circuit of the valve from torque control to limit control.

During the time the above described evaluations were going on, the Unit 2 A, B, and D AF013 valves failed to close while filling the steam generators in September 1993. The stem lubricant was changed from Neolube (graphite and alcohol) to Nebula EP-1 and the valves successfully stroked and closed against the same differential pressure. The ability of these valves to operate under the same differential pressure led Byron to believe adequate root cause had been identified (poor lubrication) and adequate corrective action had been taken (establishing proper lubrication).

**CORRECTIVE STEPS TAKEN AND RESULTS ACHIEVED:**

A MOV operability margin review for all Byron Station valves completed in June 1994 concluded the AF013 valves have positive margin. This margin does not include test and equipment uncertainties. A modification to increase margin by changing the control circuit from torque control to limit close control will be installed during the upcoming refueling outages B1R06 and B2R05. All AF013 valves will be VOTES tested during refueling outages B1R06 and B2R05 which will validate lubrication assumptions used in the operability margin review (NTS 454-100-94-01002-01 and 455-100-94-01002-01). The need for additional design changes will be evaluated after the Unit 1 AF013 testing is completed (NTS 454-100-94-01002-02 and 455-100-94-01002-02).

**CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FURTHER VIOLATION:**

This violation on the AF013 valves is indicative of a more general issue. The MOV program has frequently changed due to industry events, testing experience and operating/maintenance experience. The MOV design information was not maintained in a single database and it was difficult to determine margin. Site personnel did not have the expertise to challenge and fully understand corporate program direction. The self assessment performed in August 1993 recognized these weaknesses and recommended the implementation of an easy to understand MOV margin database, which could be modified for valve grouping and feedback of tested values into design equations to validate margin. The self assessment in December 1993 increased awareness of the need to complete corrective action for the AF013 issue and elevated the site priority of the MOV program. In early 1994, the format for the operability margin database was finalized, so that data manipulations and understanding of actual margin would be less complicated. This database has been completed and was used during the Engineering and Technical Support audit to assess the AF013 valves. The intention of the database was to then forecast which valves should be modified and to what degree. This has also been completed for these valves, with modification scheduled in upcoming outages.

The concern in MOVs has been reviewed against other areas of onsite Engineering. Current efforts of SEC are to increase in-house Engineering capabilities so that onsite engineers provide more than production in programs but can be technically strong enough to challenge the programs they are managing.

**DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED:**

The modification to change the AF013 valve control circuit to limit control and associated VOTES testing will be completed on Unit 1 during refueling outage B1R06 (fall 1994) and on Unit 2 during refueling outage B2R05 (spring 1995). The above testing data will be used to determine the final disposition of the AF013 valves.

The increase in in-house Engineering capability and resource allocation will continue on an ongoing basis.

**ATTACHMENT B  
RESPONSE TO NOTICE OF VIOLATION  
INSPECTION REPORT 454/94010;455/94010**

**VIOLATION (454(455)/94010-03)**

10 CFR 50, Appendix B, Criterion V, states, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.

Contrary to the above, as of May 23, 1994, steps to clean and lubricate the entire stems and stem nuts for the AF-013 valves (activities affecting quality) were not prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances and were not accomplished.

This is a Severity Level IV violation (Supplement 1)

**REASON FOR THE VIOLATION:**

Engineering issued a letter in February 1992 (CHRON 0114873) requiring cleaning and lubrication of the entire threaded portion of the AF013 valve stem and stem nut on a 18 month refueling outage frequency. This letter was reviewed by the MOV coordinator who interpreted the directions as requiring cleaning and lubrication of only the threaded portion of the stem but not the stem nut itself. These directions were verbally conveyed to the maintenance/fuel handling departments who performed the initial cleaning and lubrication. The use of verbal communication between the MOV coordinator and the maintenance/fuel handling departments to convey lubrication instructions was common practice so written instructions/procedures were not initiated. The frequency of lubrication was increased in the lubrication tracking program but details of cleaning the stem were not incorporated into procedures.

**CORRECTIVE STEPS TAKEN AND RESULTS ACHIEVED:**

Review of the change in lubrication method has been conducted with the appropriate maintenance and fuel handling foremen. Procedure changes describing how to clean and lubricate all motor operated valves have been completed. The AF013 valves have been scheduled to be properly lubricated during B1R06 and B2R05.

An awareness memo of the policy to track all open items in Engineering letters has been distributed.

**CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FURTHER VIOLATION:**

Training for the Electrical Maintenance and Fuel Handling departments on the cleaning and lubrication procedure will be completed prior to B1R06.

SEC identified in fall of 1993 that some recommendations in MOV Engineering letters were not being adequately considered. A policy was implemented for future MOV Engineering letters to be reviewed for assumptions, recommendations and requirements. Tracking items are written to ensure disposition of identified items. A review of past MOV Engineering letters was performed, however, the letter in question was not in the MOV coordinator's files and was missed. Letters not available during the initial MOV Engineering letter review are being identified and reviewed for undispositioned items. This lesson is being applied to other areas of onsite Engineering in that, future Engineering letters in non-MOV areas will be reviewed and tracking items will be issued to ensure disposition of open items.

**DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED:**

Training for the departments will be completed by September 8, 1994 (NTS 454-100-94-01003-01). The AF013 valves will be properly lubricated during B1R06 and B2R05. The review of MOV Engineering letters not previously reviewed for need of tracking items will be completed by September 8, 1994 (NTS 454-100-94-01003-02).

**ATTACHMENT C  
RESPONSE TO NOTICE OF VIOLATION  
INSPECTION REPORT 454/94010;455/94010**

**VIOLATION (454(455)/94010-05)**

10 CFR Part 50, Appendix B, Criterion X, Inspection, requires that inspection of activities affecting quality shall be established and executed by or for the organization performing the activity to verify conformance with the documented instructions, procedures, and drawings for accomplishing the activity.

Contrary to the above, in three cases, including installation of relief valve 1SA148A on the Emergency Diesel Generator air start system, inadequate inspection allowed conditions outside of design tolerance to continue without identification or correction.

This is a Severity Level IV violation (Supplement I).

**REASON FOR THE VIOLATION:**

The Quality Control Inspection Plan, Consisting of Procedure BAP 1099-3 Rev. 1, "QC Field Inspections", and Policy #94NWR-004, "QC Inspection Policy and Discretionary Inspection List", did not require QC to perform Mandatory (100%) Dimensional Verification Inspections on Piping and Component Support Installations for Safety/Regulatory Related Minor/Exempt Changes.

**CORRECTIVE STEPS TAKEN AND RESULTS ACHIEVED:**

An inspection was performed of all Safety and Regulatory Related minor and exempt changes installed since 1/1/89 of which eight involved twelve separate piping and/or support installations. Of these twelve, two had dimensional verification performed by Station Quality Control and were found to be acceptable as part of the installation activity. Four Installations were verified with one being unacceptable when the original issue was raised by the NRC during walkdown of the diesel generator starting air system. The remaining six installations have been inspected to verify proper installation. All inspections were performed by an NQA-1 Certified Inspector with inspection reports documenting the results. The Non-Conforming Installations were documented and resolved on Discrepancy Records. (#06-94-0037 and #06-94-0040)

**CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FURTHER VIOLATION:**

Quality Control has implemented Policy #94NWR-005, dated 5/23/94, "QC Field Inspection Involvement in Safety/Regulatory Related Minor and Exempt Changes". This Policy requires 100% Dimensional Verification Inspections on Piping and Component Support Installations installed under the Minor/Exempt Change Process. This will remain in effect until such time that an Inspection Sampling Plan is implemented and the Quality of Installations has reached a minimum of 97.5% acceptance, based on Industry Recognized Standards. (ie., NCIG09)

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED:

Byron Station is presently in full compliance based on the implementation of QC Policy #94NWR-005 on 5/23/94, the Dimensional Inspections performed on all Safety/Regulatory Minor/Exempt Changes since 1989, and the Accepted Resolutions to DR #06-94-0037 and DR #06-94-0040 which addressed the Dimensional Differences.



ATTACHMENT D  
RESPONSE TO INSPECTOR FOLLOW-UP ITEM (IFI)  
INSPECTION REPORT 454/94010;455/S4010

IFI (454(455)/94010-01)

Based on desktop review and walkthroughs of a sample of EOPs for which Verification & Validation (V&V) had been completed, the inspectors concluded the licensee's V&V of procedures was weak. Several problems were identified which should have been identified and addressed through the V&V program. Although no problems were identified that would prevent a procedure from being performed, the problems could cause delay and confusion during performance of a procedure under accident conditions. These problems were similar to those identified in NUREG-1358, "Lessons Learned From the Special Inspection Program for Emergency Operating Procedures," issued April 1989, and Supplement 1 to NUREG-1358, issued October 1992. The identification of weaknesses in EOP validation and verification will be tracked as an Inspection Followup Item.

RESPONSE

All current BOA's will be separated into blocks and assigned to a shift crew for a one time review. Any additional errors similar to those found during the inspection should be found during this review. Clear requirements and criteria will be provided to the shift crew. NTS Item 454-100-94-01001-01

The station has purchased software that will minimize the chance of wrong unit EPNs and locations being used in a procedure. This software creates a procedure common to both units and has a complete list of all EPNs and locations that are used in the Emergency Procedures. When a unit 1 procedure is printed the software only includes the unit 1 EPNs and locations. This program, VEPROMS Referenced Objects version, will be used for all future full revisions to the BOAs and Emergency Procedures.

The Emergency Procedures are a complex network of instruction steps that must be properly maintained and documented. Other areas in the company have similar requirements for both documents and processes. These areas will be contacted to determine if any of their methods would be of use in the EOP V&V process. NTS Item 454-100-94-01001-02

Byron Station's Procedure Generation Package and Writer's Guide are based on Westinghouse documents. A need was noted to revise the V&V paperwork to improve efficiency and resolve ambiguous responsibilities. This revision will be completed and used for all future full revisions to the Emergency Procedures and the BOA's. Several revisions have been made to address specific issues. A methodical review of industry experience documents will be conducted and Byron's documents revised accordingly. This review will include SOER's, NUREG's and available inspection reports. NTS Item 454-100-94-01001-03