



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

August 11, 1994

U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Attention: Document Control Desk

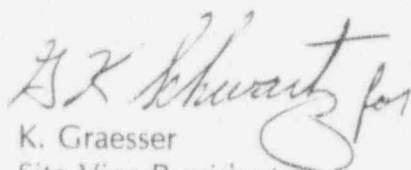
Subject: Byron Nuclear Power Station Units 1 and 2  
Response to Notice of Violation Inspection  
Report Nos. 50-454/94010; 50-455/94010  
NRC Docket Numbers 50-454, 50-455

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 supplemental response to the Notice of Violation (NOV) 454(455)/94010-02 which was transmitted with the referenced letter and Inspection Report. The supplemental response contains the items that were discussed and agreed upon during the phone conversation on 08/04/94 between your inspectors and Byron station management. The changes are annotated in bold/italic print.

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,

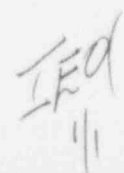


K. Graesser  
Site Vice President  
Byron Nuclear Power Station

Attachment(s)

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

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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). ***The lubrication may not have been the root cause, the upcoming testing on the AF013s will assure that the other valve parameters are acceptable.***

#### **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. ***Byron will consider the need to evaluate other valves with lubrication similar to that of the AF013 valves (NTS 454-100-94-01002-03 and 455-100-94-01002-03.***

**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.