

**Commonwealth Edison**

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April 25, 1984

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Mr. James G. Keppler  
Regional Administrator  
U.S. Nuclear Regulatory Commission  
Region III  
799 Roosevelt Road  
Glen Ellyn, IL 60137

Subject: Dresden Station Unit 2  
Response to Inspection  
Report No. 50-237/84-02  
NRC Docket No. 50-237

Reference (a): C. E. Norelius letter to Cordell Reed  
dated February 27, 1984.

(b): B. Rybak letter to J. G. Keppler  
dated January 30, 1984.

Dear Mr. Keppler:

This letter is in response to the inspection conducted by Messrs. T. M. Tongue, R. D. Walker and S. Stasek between January 10 and 24, 1984, of activities at Dresden Station Unit 2. Reference (a) indicated that certain activities appeared to be in noncompliance with NRC requirements. The Commonwealth Edison Company (CECo) response to the Notice of Violation is provided in the enclosure. The applicable portions of reference (b) are included. Also included in Attachment A is our response on the corrective actions for the other CECo facilities as applicable.

If you have any further questions on this matter, please direct them to this office.

Very truly yours,

D. L. Farrar  
Director of Nuclear Licensing

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Attachment

cc: NRC Resident Inspector - Dresden

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ATTACHMENT A

COMMONWEALTH EDISON COMPANY  
RESPONSE TO NOTICE OF VIOLATION

The item of noncompliance identified in the appendix of the NRC letter dated February 24, 1984, are responded to in the following paragraphs:

1. 10 CFR 50, Appendix B, Criterion V, as implemented by Commonwealth Edison Company Topical Report CE-1-A, Section 5, requires that activities affecting quality shall be prescribed by and accomplished in accordance with documented procedures appropriate to the circumstances.

- a. Dresden General Procedures, DGP 2-4, "Unit 2/3 Shutdown from Power Operation from Hot Standby" and DGP 3-4, "Control Rod Movement - Control Rod Sequences", provide specific direction for movement of control rods in the reactor.

Contrary to the above, on January 9, 1984, control rod manipulations were not conducted in accordance with the control rod sequence package resulting in the skipping of twenty steps in the shutdown sequence prior to its discovery and correction by licensee personnel.

- b. Dresden Administrative Procedure DAP 3-5, "Implementation Procedure for Commonwealth Edison Production Instruction 1-3-A-1 and 1-3-A-29 (Out of Service and Personnel Protection)", provides the mechanism for removing equipment from service in order to evaluate system configurations before, during and after outages.

Contrary to the above, on January 9, 1984, the Rod Worth Minimizer was removed from service and left in that condition. This was done without the knowledge or permission of operations personnel. In addition, on numerous occasions in the past, that system was removed from service without use of the out-of-service tagging system and was not recorded in appropriate records.

Discussion

A full discussion of the events both preceding and following the control rod manipulation error, our investigations the subsequent corrective actions is contained in our B. Rybak letter to J. G. Keppler dated January 30, 1984. Where possible we will refer to the applicable portions of that submittal (designated as the "Final Report") in this report.

Dresden Unit 2 had been operating a full power when the determination was made by plant management that a shutdown to HOT STANDBY was required to repair 2B EHC pressure regulator. At 1900 hours on January 9, 1984, a 200 MWe/hr. load decrease on recirculation flow was begun. Control rod insertion was done in accordance with control rod sequence A2 Revision 4.

On December 27, 1983, a new copy of control rod sequence A-2 Rev. 4 was issued by the Nuclear Engineers. This was to replace the previous copy which had run out of space for NSO signoffs due to previous control rod maneuvers. On the copy of the control rod sequence steps which were currently withdrawn were indicated by a diagonal line drawn through the "OUT" box for the appropriate steps on the sequence.

Control rod insertion began at Step 149. Step 123 of the sequence was the first step where the NSO encountered the diagonal line in the "OUT" box intended to mean the step has been withdrawn. However, the NSO interpreted the diagonal line to mean the step should be skipped and he proceeded to the next step which had been initialed and dated as withdrawn, Step 121. He then inserted that step, and continued in this fashion, inserting steps which were initialed and skipping steps containing diagonal lines.

At Step 112, a trainee began performing the rod insertions, under the direction of a new NSO who had come in early to assist in the shutdown (extra NSO in addition to Unit NSO). Control rod insertions continued, with steps containing diagonal lines continuing to be skipped until Step 98 was reached. At this point (40% power) the extra NSO attempted to latch in the Rod Worth Minimizer (RWM). It would not latch in, with RWM error messages "97-NOT LOADED" and "81-INCOMPLETE SEQUENCE" being displayed. They then notified the SCRE who printed out an OD-7, Rod Position Display, off of the process computer to verify symmetrical rod pattern. It was determined that the rod pattern was symmetric and contained no unusual rod configurations (adjacent rod tips). It was then suspected that the RWM would not latch due to core power being at 40%, above the RWM Low Power Alarm Point of 35%. Since RWM operability was not required above 20% power, control rod insertion was resumed (by trainee) using an independent verifier (extra NSO) to further reduce core power and re-attempt RWM initialization. Again, all arrays indicating a diagonal line through the corresponding steps were bypassed.

At Step 88, the NSO's noticed that all steps preceeding to Step 88 were also "lined-out", and that an apparent error had been made. This was verified, the Shift Engineer informed and a qualified Nuclear Engineer called in and further control rod manipulations were terminated until the

Nuclear Engineer arrived on site. The Station Superintendent was notified and a potentially significant event was classified (NSDD-A07), due to the potential for the Banked Position Withdrawal Sequence (BPWS) being violated if the error would have continued below 20% (when the RWM would have been required operable). The Assistant Superintendent for Operations was called in and initiated an independent investigation. The Division V.P. Nuclear Stations was immediately contacted for concurrence with the actions in progress.

#### Corrective Action Taken and the Results Achieved

The Qualified Nuclear Engineer, who arrived on-site, evaluated BPWS concerns, preconditioning, and rod pattern symmetry. He then proceeded to issue Change Log Instruction per DGP 3-4 to correct the control rod pattern and bring it into compliance with the BPWS rules.

Attempts were then made to initialize the Rod Worth Minimizer. The RWM would not latch. The computer software technician was contacted and it was determined that an RWM hardware problem existed (parity error). At 0200 hours, control rod insertions were resumed to attain HOT STANDBY using an independent verifier. Sequence steps indicating a diagonal line were inserted.

On January 9, 1984, upon determination of the potentially significant event, the Assistant Superintendent for Operations was called in to the site and conducted an initial investigation of the event. All personnel directly involved in the event were interviewed and log books, computer edits, the DVR and the control rod sequence package were reviewed. A description of the investigation and our determination of the cause of the event and the short-term corrective actions is detailed in the Summary of Investigation, Event Causes and Corrective Actions Short-Term sections of the Final Report.

An investigation was begun in accordance with NSDD-A07. A committee was appointed by the Operations Manager NSD and the Dresden Station Superintendent on January 10, 1984. The committee consisted of the following personnel:

- Dresden Assistant Superintendent - Operating
- BWR Plant Support Group Leader, NFS
- Dresden Assistant Lead Nuclear Engineer
- Dresden Training Instructor
- Nuclear Station Operator - Dresden
- Operating Union Steward - Local 1460

Investigations were initiated by individual members of the committee on January 9 and 10. The full committee met on January 11 through 13 to continue and complete the investigation. A summary of their investigations and the cause of the event is listed in the Summary of Investigations and Event Cause sections of the Final Report.

### Corrective Action to be Taken to Avoid Further Noncompliance

The investigation of this event and the similarities observed in the Quad Cities event indicate that corrective actions for this event should be developed along two general philosophies. Number one, actions will be taken to minimize the occurrence of misinterpretation and resultant procedure violations. Secondly, actions will be taken to provide for the early detection of errors when they occur. These changes follow the guidance provided by the Corrective Actions-Long Term section of the Final Report. The actions will include:

1. Dresden General Procedure 3-4, "Control Rod Movements - Control Rod Sequences", will be revised to provide:
  - a. A consistent method of designating that a sequence step has been performed when clean copies or revised sequences are issued. An accompanying legend should be provided, if necessary. The symbol "X" or a diagonal line are not to be used.
  - b. A caution sheet in the Control Rod Sequence Package requiring a signoff by an NSO prior to use of its contents. This sheet would inform the operator to review and familiarize himself with the entire sequence package prior to use. It would also require that, while performing in sequence control rod maneuvers, the status of steps to be skipped should be confirmed by selecting the appropriate rod(s) and verifying their position.
  - c. An index in the sequence package describing its contents.
  - d. A means of verifying the proper control rod pattern at key points in the sequence.
  - e. A reference to DOP 400-2 in order to determine RWM operability and for instructions on independent verification.
  - f. A requirement that an independent Nuclear Engineer verify that the completed sequence steps have been properly transcribed onto a new copy of the sequence (or a revised sequence) prior to its issuance.
  - g. A requirement to verify that a new sequence is loaded into the RWM before it is distributed.
  - h. A requirement that a Qualified Nuclear Engineer complete a Control Rod Maneuver Request Form (with the Shift Supervisor's approval) prior to any unplanned changes to the Control Rod Sequence Package.

2. Although DOP 400-2, "Rod Worth Minimizer" provided some guidance as to when to bypass the RWM, a separate procedure has been initiated to ensure that there is adequate guidance regarding RWM operability. Prior to bypassing the RWM the procedure requires contacting a computer coordinator or designee. In addition, the procedure describes the proper method for independent verification of control rod movement in the event of failure of the RWM. The independent verifier will be required to verify the current rod pattern is in compliance with the sequence prior to resumption of control rod movement.
3. A procedure was developed to administratively control work on the RWM or process computer which could render them inoperable or degrade their performance. The procedure will direct RWM/computer maintenance and personnel are kept informed of RWM computer status.
4. Station Procedure DAP 9-1, "Station Procedures", was revised to caution against any unexplained or ambiguous use of symbols in any procedures.

All procedures have been reviewed and approved and are in place. Finally, all licensed personnel, Nuclear Engineers, and other affected departments will receive training on the applicable procedures described above. Training will be completed by June 1, 1984.

In addition to the actions taken at Dresden Station, the following actions involving other CECO BWR's have been taken for Item 1 of the appendix of your Notice of Violation.

Quad Cities Station has reviewed the final report of the Investigative Committee of the Dresden incident. Procedures for control rod movements and control rod sequencing were altered extensively as a result of the rod insertion error that took place at Quad Cities last year. In several cases, entirely new procedures were implemented as a result of the shortcomings identified by the event. In addition to these above actions, further changes to several procedures are being implemented as a response to the event at Dresden Station. Full implementation of these changes will be by June 1, 1984.

LaSalle County Station has also reviewed applicable procedures and has identified several procedures that will be modified as a response to the Dresden event. Full implementation of these changes has been achieved.

As Item 2 of your Notice of Violation, a Task Force has been formed to prepare recommendations over control of computer maintenance for all our licensed facilities. The principal conclusion of this Task Force affecting the Dresden incident is that maintenance activities on computers that are required by the Technical Specifications or are required for safe operation of the plant, should be performed under the Work Request system, per Quality Procedure 3-52. Final conclusion of the Task Force will be presented to Corporate management by June 1, 1984 and implementation of its recommendations will be completed by October 1, 1984 and all the licensed facilities.

Date When Full Compliance Will Be Achieved

Date for full compliance has been noted in the previous section.