

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-237/91024(DRP)

Docket No. 50-237

License No. DPR-19

Licensee: Commonwealth Edison Company  
Opus West III  
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Downers Grove, IL 60515

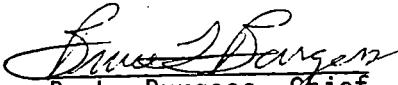
Facility Name: Dresden Nuclear Power Station, Unit 2

Inspection At: Dresden Site, Morris, IL

Inspection Conducted: September 1 through October 29, 1991

Inspector: W. G. Rogers

Approved By:

  
B. L. Burgess, Chief  
Projects Section 1B

11/13/91  
Date

Inspection Summary

Inspection during the period of September 1 through October 29, 1991  
(Report No. 50-237/91024(DRP)).

Areas Inspected: Special unannounced resident inspection of the circumstances surrounding four high steam line reactor protection/containment isolation channels being rendered inoperable.

Results: One apparent violation - Technical Specification 3.1.A.1. Limiting condition for operation (LCO) was not met. (Paragraph 5).

## DETAILS

### 1. Persons Contacted

#### Commonwealth Edison Company

- \*E. Eenigenburg, Station Manager
- \*L. Gerner, Technical Superintendent
- E. Mantel, Services Director
- \*D. Van Pelt, Assistant Superintendent - Maintenance
- \*J. Kotowski, Production Superintendent
- J. Achterberg, Assistant Superintendent - Work Planning
- \*G. Smith, Assistant Superintendent-Operations

The inspector also talked with and interviewed several other licensee employees, including members of the technical and engineering staffs; reactor and auxiliary operators; shift engineers; foremen; electrical, mechanical, and instrument personnel; and contract security personnel.

\*Denotes those attending one or more exit interviews conducted informally at various times throughout the inspection period.

### 2. Background

There are four steam lines from the reactor to the common steam header for Unit 2. Each steam line has one radiation monitor to sense fuel failure. When two of the four monitors sense high radiation, the reactor scram and Group I isolation (main steam isolation valves closure) logic/trip circuits are actuated. The trip setpoint for the radiation monitors is 3 times background.

Unit 2 at Dresden uses hydrogen addition into the reactor coolant system to reduce intergranular stress corrosion cracking of the reactor recirculation piping. However, the additional hydrogen substantially increases the background radiation in the the steam lines by increasing the noncondensable gases/gamma radiation field. Therefore, there are two trip setpoints (3 times background) for the steam line radiation monitors depending upon whether hydrogen addition is in service (high background) or out of service (low background).

### 3. Description of Event

At 8:25 a.m., on August 20, 1991, with the Unit 2 reactor at 94% power, instrument mechanics (IMs) and an observer received authorization from the operating shift to perform the quarterly calibration of the main steam line radiation monitors. The calibration is required by the Technical Specification. At 9:00 a.m., hydrogen addition to the reactor coolant system was secured to support the calibration. As part of

the calibration procedure the as-found dual setpoints were to be checked with the previous as-left setpoints. Therefore, the procedure instructs the technician to obtain the previous calibration data sheets and enter the setpoints on the new data sheets. The previous setpoints were obtained and entered on the new data sheets. When transcribing data for the required trip setting and acceptable range columns, the previous setpoints/acceptable ranges, not the newly calculated ones, were entered. These numbers should have been entered later in the performance of the procedure. Interviews with the licensee indicate that the observer asked the technician where data was to be inserted and how to do the calculations, which may have contributed to the errors.

The Table below indicates the correct setpoints versus what the setpoints were left at. As the Table reflects, the error in transcribing did not render the "without H2 addition" trip function inoperable but only the "with H2 addition" trip function.

STEAMLINE	ACTUAL AS-LEFT SETPOINT	SETPOINT IT SHOULD BE
A	8502 mr with H2	8300 mr with H2
	1740 mr without H2	1973.7 mr without H2
B	11139 mr with H2	10900 mr with H2
	2450 mr without H2	2634.3 mr without H2
C	8880 mr with H2	8598.9 mr with H2
	1760 mr without H2	1993.8 mr without H2
D	9290 mr with H2	8807.4 mr with H2
	1860 mr without H2	2079.6 mr without H2

All four channels were non-conservatively set by 202, 239, 281.1 and 482.6 mr respectively with hydrogen injection in service.

The surveillance was partially performed by the dayshift IMs with work stopping at the point of transferring data for the new alarm and trip setpoints. The dayshift supervisor reviewed the calculations for the new setpoints and approved them. The dayshift IM understood that the setpoints should be changed but this information was lost in the turnover. When the afternoon IM reviewed the procedure he saw that the "new" setpoints had been transferred but these were really the old setpoints. The afternoon IM checked that the "new" setpoints met the acceptance criteria. No adjustments to the setpoints were made and the procedure was submitted to the afternoon IM supervisor for review.

The afternoon IM supervisor reviewed the as-left/required data sheet for review and approval. An interview with the procedure writer indicated that the supervisor's signature on the data sheet was for assuring that all blocks were completed and Technical Specifications met. An interview with the supervisor indicated that he reviewed the data for completion and whether the acceptance criteria were met (in this instance, the acceptance criteria was wrong). The surveillance was signed off at 5:50 p.m., on August 20, 1991, by the IM afternoon supervisor and the shift supervisor. An operational functional test was performed and hydrogen addition was placed back into service at 8:00 p.m.

During the post implementation review process, the department surveillance coordinator identified the improper setpoints on August 21, 1991. The Shift Engineer was contacted and another calibration begun at approximately 2:00 p.m. An emergency notification system (ENS) notification of the event was made at 2:35 p.m.

At 4:55 p.m., the setpoints were changed to the proper, more conservative calculation results.

#### 4. Analysis of Root Cause

The inappropriate personnel action was caused by a number of factors:

- a. There was an observer present during the surveillance which provided additional stress on job performance.
- b. The procedure quality was poor.
  - . The procedure was vague as to where to record the old surveillance procedure results and where the new calculation results were to be used.
  - . The delineation of the acceptance criteria was not in close proximity to the test results and was intermixed with other data. This increased the difficulty in reviewing the results of the surveillance.
- c. The management control system was inadequate in detecting the inappropriate personnel action before placing the equipment back into service.
  - . The supervisor's review of the information did not detect the error in acceptance criteria.
- d. An essential piece of information was lost in the turnover process.
- e. The management control system was inadequate in minimizing the consequences of an inappropriate personnel action.
  - . The surveillance activity was allowed to occur on all four channels at the same time. No controls were in place to review the results for acceptability between performance on each channel.

- . The same individual was used to perform the surveillance on all four channels allowing one mind-set to affect all the channels.
- . The same test instrumentation was used to calibrate all four channels. If the test instrument had been improperly calibrated, the calibration of all four channels could have been invalid.

#### 5. Assessment of Safety Significance

This event resulted in invalidation of both trip systems of a reactor protection and containment isolation input parameter. Technical Specification 3.1.A.1 requires these channels to be operable. When four channels are inoperable all control rods must be inserted within 4 hours or main steam isolation valves closed within 5 hours. These actions did not occur. This is considered an apparent violation (237/91024-01(DRP)) of Technical Specifications. However, all channels associated with main steamline high radiation, though inoperable, would have tripped at a higher setpoint. Also, the Office of Nuclear Reactor Regulation recently concluded that the high steamline radiation trip function was unnecessary in a recent generic Safety Evaluation Report to General Electric topic report NEDO-31400. The final conclusion of safety significance to the health and safety of the public in this particular instance is negligible.

The Dresden design basis for minimizing offsite dose consequences relies upon the offgas radiation monitor setpoints isolating the release. These monitors were set at approximately 2230 mr for 15 minutes and were not affected by the main steam line radiation monitor setpoint.

However, the inadequacies in the management control system, including procedure quality, make other engineered safety feature systems vulnerable to one personnel error rendering the system inoperable.

#### 6. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) on October 29, 1991, and informally throughout the inspection period to summarize the scope and findings of the inspection activities.

The inspectors also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify any such documents/processes as proprietary. The licensee acknowledged the findings of the inspection.