

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-237/91010(DRP); 50-249/91009(DRP)

Docket Nos. 50-237; 50-249 License Nos. DPR-19; DPR-25

Licensee: Commonwealth Edison Company  
Opus West III  
1400 Opus Place  
Downers Grove, IL 60515

Facility Name: Dresden Nuclear Power Station, Units 2 and 3

Inspection At: Dresden Site, Morris, IL

Inspection Conducted: April 2 through May 16, 1991

Inspectors: D. Hills

M. Peck

R. Lerch

S. Burgess

R. Zuffa, Site Resident Engineer  
Illinois Department of Nuclear Safety

Approved By:  B. L. Burgess, Chief  
Projects Section 1B

6/5/91  
Date

Inspection Summary

Inspection from April 2 through May 16, 1991 (Report Nos. 50-237/91010(DRP); 50-249/91009(DRP)).

Areas Inspected: Routine unannounced safety inspection by the resident inspectors, regional inspectors and an Illinois Department of Nuclear Safety inspector of licensee action on previously identified items; licensee event reports; operational safety; monthly maintenance; monthly surveillance; engineered safety features walkdown; training effectiveness; events; safety assessment and quality verification; and systematic evaluation program items and report review.

Results: Two non-cited violations were identified. One involved the use of non-licensed operators to perform direct reactivity changes (paragraph 4.e) and the other involved the control of design input assumptions to the diesel generator service water calculation (paragraph 2). Two unresolved items were identified, one involved the calibration requirements of primary and secondary containment isolation damper fail-safe pressure switches (paragraph 7), the other dealt with reactor shroud head bolts not fully tightened (paragraph 9).

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## Plant Operations

This area remains under close scrutiny due to the negative trend in operational practices as delineated in recent inspection reports and as illustrated by the utilization of non-licensed operators to perform direct reactivity changes. However, identification of the Unit 2 power/flow anomaly and the quick reaction during the reactor recirculation pump run-up/over power event indicated good operator response to off normal conditions.

## Maintenance/Surveillance

This area remained on a declining trend in regard to work practices. This was exhibited by the failure to properly install the Unit 2 reactor steam separator assembly.

## Radiological Protection

Performance in this area remained good. No problems were noted during the inspection.

## Emergency Preparedness

This SALP functional area was not addressed in this inspection period.

## Security

Performance in this area remained good. No problems were noted during the inspection.

## Safety Assessment and Quality Verification

Performance in this area continued to improve. This was evident by the coordination and review of NRC concerns identified at the Quad Cities facility.

## Engineering and Technical Support

This area remains under close scrutiny due to the mixed trend delineated in past reports. This was evident by the utilization of non-conservative assumptions utilized in the diesel generator cooling water calculations.

## DETAILS

### 1. Persons Contacted

#### Commonwealth Edison Company

- \*E. Eenigenburg, Station Manager
- \*L. Gerner, Technical Superintendent
  - J. Kotowski, Production Superintendent
  - E. Mantel, Services Director
- \*D. Van Pelt, Assistant Superintendent - Maintenance
  - J. Achterberg, Assistant Superintendent - Work Planning
- \*G. Smith, Assistant Superintendent-Operations
- \*K. Peterman, Regulatory Assurance Supervisor
  - M. Korchynsky, Operating Engineer
  - B. Zank, Operating Engineer
  - J. Williams, Operating Engineer
  - R. Stobert, Operating Engineer
  - T. Mohr, Operating Engineer
- M. Strait, Technical Staff Supervisor
- L. Johnson, Q.C. Supervisor
- J. Mayer, Station Security Administrator
- D. Morey, Chemistry Services Supervisor
- D. Saccomando, Health Physics Services Supervisor
- K. Kociuba, Quality Assurance Superintendent
- \*D. Lowenstein, Regulatory Assurance Analyst
- \*R. Radtke, Compliance Engineering, Nuclear Licensing
- \*R. Wahlen, Technical Staff
- \*R. Janecek, Sr. Participant - Offsite Review
- \*K. Yaks, ONS Administrator
- \*B. Viehl, Nuclear Engineering Department, Supervisor

\*Denotes those attending the exit interview conducted on May 16, 1991.

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

### 2. Previously Identified Inspection Items (92701 and 92702)

(Closed) Unresolved Item (50-237/91003-02): The licensee has responded to NRC concerns regarding the appropriateness of design input parameters/assumptions utilized in the Stone and Webster Diesel Generator Cooling Water (DGCW) Requirements Calculation (18662-M(CI)-10 Revision 0). Examples of assumption discrepancies included:

- 1100 gpm design Diesel Generator (D/G) water jacket side flow was assumed. This input was non-conservative and inconsistent with the 1080 gpm value required by the vendor manual reference.

The calculation assumed 2500 Kw for the continuous D/G output rating and 2750 Kw for the two hour overload condition. This input was non-conservative and inconsistent with the Final Safety Analysis Report (FSAR) ratings of 2600 Kw for continuous output and 2860 Kw for the overload condition.

The assumed design cooling manifold temperature alarm location used in the calculation was not consistent with plant drawing M517. The calculation incorrectly positioned the alarm on the heat exchanger inlet while the drawing indicated the alarm temperature switch to be on the outlet.

The calculation was revised following NRC identification of the discrepancies. The revised calculation resulted in an increase of the minimum flow requirement from 830 gpm to 840 gpm. When compared to the 850 gpm available flow established during testing, the use of corrected input assumptions reduced the analytical flow margin 50%. To correct the programmatic deficiencies of inadequate review of design deficiencies, the licensee issued Engineering and Construction (ENC)-QE-81, Revision 0, "Review of Assumptions and Judgements For Architect Engineered Supplied Design Evaluations". ENC-QE-81 was to ensure the applicable regulatory requirements were addressed for design evaluations and an adequate review of associated assumptions was performed. Failure to adequately control design input assumptions used by contract architect/engineers is considered a violation of (50-237/91010-01(DRP)) 10 CFR 50, Appendix B, Criterion III, "Design Control". However, as this was considered to be an isolated occurrence of minimum safety significance, and the appropriate corrective actions were completed, a Notice of Violation is not being issued in accordance with 10 CFR 2, Appendix C, Section V.A. The inspector has no further concerns in this area.

(Open) Open Item (50-237/89019-04): Verify installation of river level indication and alarm in the control room for Systematic Evaluation Program (SEP) Topic II-3.B.1/4.1.4. This item is to remain open until the modification has been completed. Current expected completion date is September 1991.

One non-cited violation and no deviations were identified in this area.

### 3. Licensee Event Reports Followup (90712 and 92700)

Through direct observations, discussions with licensee personnel, and review of records, the following event reports were reviewed to determine that reportability requirements were fulfilled, immediate corrective action was accomplished, and corrective action to prevent recurrence had been accomplished in accordance with Technical Specifications.

- a. (Closed) LER 237/91001: Partial Group I Isolation Due to Shorting of 1B Main Steam Isolation Valve (MSIV) Position Indicating Light Socket.
- b. (Closed) LER 237/91003: Omission of Liquid Radwaste Discharge Composite Analysis Due to Management Deficiency.
- c. (Closed) LER 237/91006: Unplanned Primary Containment Group V

Isolation Due to Unknown Causes.

- d. (Closed) LER 237/91007: Violation of Core Thermal Power Limits Due to Unplanned 2B Reactor Recirculation Pump Speed Increase.

In addition, the inspector reviewed the licensee's Deviation reports (DVRs) generated during the inspection period. This was done in an effort to monitor the conditions related to plant or personnel performance, potential trends, etc. DVRs were also reviewed for initiation and disposition as required by the applicable procedures and the Quality Assurance (QA) manual.

No violations or deviations were identified.

4. Operational Safety Verification (71707)

The inspectors daily and randomly verified during back shift and on weekends, that the facility was being operated in conformance with the licenses and regulatory requirements and that the licensee's management control system was effectively carrying out its responsibilities for safe operation. This was done on a sampling basis through routine direct observation of activities and equipment, tours, interviews and discussions with licensee personnel, verification of safety system status and limiting conditions for operation action requirements (LCOs), corrective action, and review of facility records.

On a sampling basis the inspectors daily verified proper control room staffing and access, operator behavior, and coordination of plant activities with ongoing control room operations; verified operator adherence with the latest revisions of procedures for ongoing activities; verified operation as required by Technical Specifications (TS); including compliance with LCOs, with emphasis on engineered safety features (ESF) and ESF electrical alignment and valve positions; monitored instrumentation recorder trace channels for abnormalities; verified status of various lit annunciators for operator understanding, off-normal condition, and corrective actions being taken; examined nuclear instrumentation and other protection channels for proper operability; reviewed radiation and stack monitors for abnormal conditions; verified that onsite and offsite power was available as required; observed the frequency of plant/control room visits by the station manager, superintendents, assistant superintendents, and other managers; and observed the Safety Parameter Display System for operability.

During tours of accessible areas of the plant, the inspectors made note of general plant/equipment conditions, including control of activities in progress (maintenance/surveillance), observation of shift turnovers, general safety items, etc. The specific areas observed were:

a. Engineered Safety Features (ESF) Systems

Accessible portions of ESF systems and components were inspected to verify: valve position for proper flow path; proper alignment of

power supply breakers or fuses (if visible) for proper actuation on an initiating signal; proper removal of power from components if required by TS or FSAR; and the operability of support systems essential to system actuation or performance through observation of instrumentation and/or proper valve alignment. The inspectors also visually inspected components for leakage, proper lubrication, cooling water supply, etc.

b. Radiation Protection Controls

The inspectors verified that workers were following health physics procedures for dosimetry, protective clothing, frisking, posting, etc., and randomly examined radiation protection instrumentation for use, operability, and calibration.

c. Security

Each week during routine activities or tours, the inspector monitored the licensee's security program to ensure that observed actions were being implemented according to their approved security plan. The inspector noted that persons within the protected area displayed proper photo-identification badges and those individuals requiring escorts were properly escorted. The inspector also verified that checked vital areas were locked and alarmed.

d. Housekeeping and Plant Cleanliness

The inspectors monitored the status of housekeeping and plant cleanliness for fire protection, protection of safety-related equipment from intrusion of foreign matter and general protection of equipment from hazards.

e. Reactivity Control By Non-Licensed Individuals

The licensee identified the inappropriate practice of utilizing non-licensed operators to perform local manual operation of the reactor recirculation (RR) pump scoop tube positioner. The change in the position of the scoop tube resulted in a direct change of reactor reactivity. This evolution was performed on the 2A RR pump by a non-licensed operator on June 29 and 30, 1990. The problem was attributed to a failure of the corporate licensing organization to identify local scoop tube manipulations as a direct reactivity control during the review of the Title 10, Code of Federal Regulations, Part 55, March 1987 revision. To correct the deficiency, Dresden Operating Procedure (DOP) 202-12, "Recirculation Pump Motor Generator Set Scoop Tube Operation", was revised to restrict local RR pump scoop tube manipulation only by licensed operators. The practice was in violation (50-237/91010-02(DRP)) of 10 CFR 50.54(i) and 10 CFR 55.13, which requires the licensee to not permit manipulation of the controls of the facility by anyone who is not a licensed operator or licensed operator trainee. However, as this violation was considered an isolated occurrence and corresponded to the criteria for the exercise of discretion delineated in 10 CFR 2, Appendix C, Section V.G.1, a Notice of

Violation is not being issued. The inspectors considered licensee identification of this issue to represent good coordination and review of NRC concerns at the Quad Cities facility.

The inspectors also monitored various records, including tagouts, jumpers, shift logs and surveillance, daily orders, maintenance items, various chemistry and radiological sampling and analysis, third party review results, overtime records, QA and/or Quality Control (QC) audit results, and postings required per 10 CFR 19.11.

One non-cited violation and no deviations were identified in this area.

5. Monthly Maintenance Observation (62703)

Station maintenance activities affecting the safety-related systems and components listed below were observed/reviewed to ascertain that they were conducted in accordance with approved procedures, regulatory guides, and industry codes or standards and in conformance with Technical Specifications.

The following items were considered during this review: the Limiting Conditions for Operation were met while components or systems were removed from service; approvals were obtained prior to initiating the work; activities were accomplished using approved procedures and were inspected as applicable; functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; activities were accomplished by qualified personnel; parts and materials used were properly certified; radiological and fire prevention controls were implemented. Work requests were reviewed to determine status of outstanding jobs and to assure that priority is assigned to safety-related equipment maintenance which may affect system performance.

The inspectors monitored the licensee's work in progress and verified that it was being performed in accordance with proper procedures, and approved work packages, that applicable drawing updates were made and/or planned, and that operator training was conducted in a reasonable period of time.

The following maintenance activities were observed and reviewed:

Unit 2

2C Electromatic Relief Valve Replacement  
Control Rod Drive Overhauls

Unit 3

3D Condensate Booster Pump Motor Overhaul  
Turbine Building Sample Panel Hangers & Tube Installation

No violations or deviations were identified in this area.

6. Monthly Surveillance Observation (61726)

The inspectors observed surveillance testing required by Technical Specifications during the inspection period and verified that testing was performed in accordance with adequate procedures, that test instrumentation was calibrated, that LCOs were met, that removal and restoration of the affected components were accomplished, that results conformed with Technical Specifications and procedure requirements and were reviewed by personnel other than the individual directing the test, and that any deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

The inspectors witnessed portions of the following test activities:

Unit 2

High Pressure Coolant Injection (HPCI) System Cold Fast Start Testing  
Rod Worth Minimizer Checkout  
Post-LOCA Containment H2/O2 Monitor Calibration

Unit 3

Reactor Wide-Range Pressure Instrumentation Calibration  
LPCI System Flow Instrumentation Calibration

No violations or deviations were identified in this area.

7. ESF Walkdown (71710)

A review of the reactor building ventilation isolation damper surveillance procedure, Dresden Technical Surveillance (DTS) 1600-29, Revision 01; plant drawings M-269, Revision H; M-529, Revision K; M-25, Revision BN; and M-356, Revision AU, indicated several discrepancies. Plant drawings M-269 and M-529 identified the reactor building ventilation isolation dampers, including the fail-safe closure mechanism and the air reservoir accumulator, as safety-related. However, plant drawings M-25 and M-356, associated with containment ventilation isolation dampers, excluded the air reservoir from the safety-related boundary. In addition, the safety-related pressure switches associated with the isolation damper fail-safe closure mechanism did not appear to be incorporated into the station calibration program. Some of the similar pressure switches on the primary containment isolation dampers also did not appear to be periodically calibrated. This issue is considered an unresolved item (237/91010-03(DRP)) pending further review of the calibration requirements for the pressure switches.

No violations or deviations were identified in this area.

8. Training Effectiveness (41400, 41701)

The effectiveness of training programs for licensed and non-licensed personnel was reviewed by the inspectors during the witnessing of the licensee's performance of routine surveillance, maintenance, and



operational activities and during the review of the licensee's response to events which occurred during the inspection period. Personnel appeared to be knowledgeable of the tasks being performed.

No violations or deviations were identified.

9. Events (93702)

On April 11, 1991, Dresden Unit 2 exceeded 102% of rated core thermal power for approximately 5 seconds. The transient occurred due to a malfunctioning deviation meter during resetting of the 2B reactor recirculation (RR) pump motor-generator (M/G) set scoop tube lockout. The magnitude of the over power event was limited by the prompt action of the reactor operator who locked-out the scoop tube at the back panel. On April 15, 1991, a second Unit 2 reactor overpower event occurred as a result of a level transient following the startup of the standby reactor feedwater pump (RFP). Reactor power exceeded 102 percent for a 20 second duration with a 105 percent peak core thermal power. The second event occurred while the RR pump scoop tube was locked out for repair of the flow controller deviation meter. The standby RFP was started following a seal failure on one of the two operating pumps.

Lifting of the Shroud Head and Steam Separator Assembly

On March 22, 1991, Dresden Unit 2 experienced an unexpected anomaly in electrical output as cooling water flow through the reactor core was increased. As coolant flow through the reactor core increased from 72 to 75 million pounds per hour, the plant's electrical output increased by 2 megawatts instead of the anticipated 30 megawatt increase. Also, reactor coolant temperature in the annulus region increased about 2 degrees Fahrenheit at the same time the core flow/electrical output anomaly occurred. Because the power/flow anomalies were similar to a Vermont Yankee event associated with the steam separator lifting from the seat on the core shroud in the reactor, the licensee commenced a Unit 2 shutdown on March 24, 1991, to inspect the reactor internals. An investigation team comprised of CECO corporate and plant individuals was formed to review this event, along with other recent maintenance-related problems during the Unit 2 refuel outage. On March 27, 1991, regional NRC specialists arrived on site to review the event and licensee actions.

On March 27, 1991, the steam dryer was removed to facilitate inspection of the shroud head bolts. With assistance from General Electric Company (GE), a detailed inspection plan was initiated and implemented, with emphasis placed on verifying if the shroud head bolts were latched and tightened. Troubleshooting and corrective action was performed under WR D00524. Visual inspections on seven accessible shroud head bolts with an underwater camera indicated that the bolts were latched, but not tightened. Subsequently, all 48 bolts were verified latched, but not tightened. Based on an evaluation performed by GE, the loose shroud head bolts would allow the shroud head and steam separator to lift at high core flow conditions. The GE analysis for the Vermont Yankee event concluded that no significant changes in plant safety margins occurred during operation with the separator assembly lifted. The causal factors for the bolts not being fully tightened is an unresolved item (249/91009-04(DRP)).

10. Safety Assessment and Quality Verification (35502 and 40500)

Dresden Station Technical Support Engineers participated in the daily Quad Cities NRC Electrical Distribution Safety Functional Inspection (EDSFI) debriefings. As a result issues raised at the Quad Cities facility were also evaluated for applicability at Dresden. This included the seismic qualification issue of the D/G fuel oil transfer and air start systems. When the seismic analysis for the Dresden fuel oil transfer system could not be retrieved, the licensee commissioned a Seismic Qualified Utility Group walkdown by Stevenson and Associates to address system operability concerns. Additionally, licensee identification of the inappropriate use of non-licensed operators to perform reactivity manipulations, as delineated in paragraph 4.e., resulted from the coordination of NRC concerns raised at the Quad Cities plant.

No violations or deviations were identified in this area.

11. Systematic Evaluation Program Items (92701)

NUREG 1403, "Safety Evaluation Report Related to the Full-term Operating License for Dresden Nuclear Power Station," Table 2.1, identified 22 SEP Integrated Plant Safety Assessment Report (IPSAR) topic resolutions to be confirmed by the NRC Region III office.

The expected completion date for Item 2 for Topic II-3.b.1/4.1.4 is detailed as Open Item 50-237/89019-04 in paragraph 2 of this report. In addition to Item 2, the following four items remain to be verified as closed by the licensee and confirmed by the NRC:

- Item 6 - Topic VI-4/4.18.6
- Item 13 - Topic III-2/2.2.2 (Supp. 1)
- Item 14 - Topic III-4.A/4.5.3 and 2.2.2 (Supp. 1)
- Item 16 - Topic VI-4/4.18.2; Topic VI-6/4.19

Each of these items were in some stage of verification review by the licensee.

No violations or deviations were identified.

12. Report Review (90173)

During the inspection period, the inspector reviewed the licensee's Monthly Operating Report for February 1991. The inspector confirmed that the information provided met the requirements of Technical Specification 6.6.A.3 and Regulatory Guide 1.16. The inspector also reviewed the Dresden Nuclear Power Station Monthly Plant Status Report for March 1991.

No violations or deviations were identified.

13. Violations For Which A "Notice of Violation" Will Not Be Issued

The NRC uses the Notice of Violation as a standard method for formalizing the existence of a violation of a legally binding requirement. However, because the NRC wants to encourage and support licensee's initiatives for self-identification and correction of problems, the NRC will not generally issue a Notice of Violation for a violation that meets the requirements set forth in 10 CFR 2, Appendix C, Section V.A. Violations of regulatory requirements identified during the inspection for which a Notice of Violation will not be issued are discussed in paragraphs 2 and 4.e.

14. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviations. The two unresolved items disclosed during this inspection are discussed in paragraphs 7 and 9.

15. Exit Interview

The inspectors met with licensee representatives (denoted in paragraph 1) during the inspection period and at the conclusion of the inspection period on May 16, 1991. The inspectors summarized the scope and results of the inspection and discussed the likely content of this inspection report. The licensee acknowledged the information and did not indicate that any of the information disclosed during the inspection could be considered proprietary in nature.