UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
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LISLE, ILLINOIS 60532-4351

March 15, 2000

Mr. Oliver D. Kingsley
President, Nuclear Generation Group
Commonwealth Edison Company
ATTN: Regulatory Services
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: DRESDEN INSPECTION REPORT 50-237/99023(DRP); 50-249/99023(DRP)

Dear Mr. Kingsley:

From December 30, 1999, to February 15, 2000, the NRC performed an inspection at your Dresden Nuclear Power Station with the support of the Illinois Department of Nuclear Safety. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the enclosed report.

During the inspection period, the conduct of activities at Dresden was generally characterized by safety-conscious operations, engineering and maintenance practices, and careful radiological work control.

Although your staff conducted plant activities in a safe and conservative manner, we noted that plant personnel from various departments demonstrated a lack of ownership of certain plant activities and issues. For example, we concluded that your staff's approach in addressing motor operated valve (MOV) issues was not commensurate with the number of actuators which failed preventive inspections. Operators did not promptly address a degraded condition of the 3A low pressure coolant injection system heat exchanger, and the inspectors routinely identified deficient conditions during plant tours that were not noted or addressed by the Dresden staff.

Based on the results of this inspection, the NRC has determined that a violation of NRC requirements occurred due to the untimely completion of an operability evaluation of a degraded low pressure coolant injection heat exchanger. This violation is being treated as a Non-Cited Violation (NCV), consistent with Section VII.B.1.a of the Enforcement Policy. This NCV is described in the subject inspection report. If you contest the violation or severity level of this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with copies to the Regional Administrator, Region III, and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001.

IE01

In accordance with 10 CFR Part 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room.

Sincerely,

/s/ M. Ring

Mark Ring, Chief
Reactor Projects Branch 1

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

Enclosure: Inspection Report 50-237/99023(DRP);
50-249/99023(DRP)

cc w/encl: D. Helwig, Senior Vice President, Nuclear Services
C. Crane, Senior Vice President, Nuclear Operations
H. Stanley, Vice President, Nuclear Operations
R. Krich, Vice President, Regulatory Services
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Chairman, Illinois Commerce Commission

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Based on the results of this inspection, the NRC has determined that a violation of NRC requirements occurred due to the untimely completion of an operability evaluation of a degraded low pressure coolant injection heat exchanger. This violation is being treated as a Non-Cited Violation (NCV), consistent with Section VII.B.1.a of the Enforcement Policy. This NCV is described in the subject inspection report. If you contest the violation or severity level of this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with copies to the Regional Administrator, Region III, and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001.

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Mark Ring, Chief
Reactor Projects Branch 1

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-237; 50-249
License Nos:	DPR-19; DPR-25
Report No:	50-237/99023(DRP); 50-249/99023(DRP)
Licensee:	ComEd
Facility:	Dresden Nuclear Station Units 2 and 3
Location:	6500 North Dresden Road Morris, IL 60450
Dates:	December 30, 1999, through February 15, 2000
Inspectors:	D. Smith, Senior Resident Inspector K. Riemer, Senior Resident Inspector B. Dickson, Resident Inspector D. Roth, Resident Inspector R. Zuffa, Illinois Department of Nuclear Safety
Approved by:	M. Ring, Chief Reactor Projects Branch 1 Division of Reactor Projects

EXECUTIVE SUMMARY

Dresden Nuclear Station Units 2 and 3
NRC Inspection Report 50-237/99023(DRP); 50-249/99023(DRP)

This report includes the results of routine inspection by the resident inspection staff from December 30, 1999, through February 15, 2000.

Operations

- The operators followed procedures, practiced good communications, and conducted informative turnovers. The inspectors noted one issue regarding an operator's misunderstanding of the status of plant equipment (Section O1.2).

- The licensee safely prepared for the 1999 to 2000 (Y2K) rollover. The plant experienced no significant computer related problems during the Y2K transition. Licensee personnel identified several minor deficiencies with the date function in balance-of-plant recorders in the main control room (Section O1.3).

- Overall, the inspectors identified no concerns with risk-significant items. However, the material condition of the electrohydraulic control system caused the licensee to reduce power to investigate and repair the system. The licensee took actions to address degraded conditions with the Unit 3A low pressure coolant injection (LPCI) heat exchanger and various safety-related motor-operated valves (Section O2.1).

- The operations staff did not make a timely operability determination when a degraded condition of the 3A low pressure coolant injection (LPCI) heat exchanger was identified. This issue was initially identified by a non-licensed operator as early as January 11, 2000. However, the licensee did not initiate an operability determination until January 28, 2000. This issue is considered a non-cited violation (Section O2.2).

- Surveillance tests were completed in a timely manner, met surveillance acceptance criteria, and the tested components remained operable (Section O3.1).

- The operations procedures and documentation from the operator rounds sheets were generally acceptable. The operators usually used procedures in accordance with the licensee's requirements. However, the inspectors noted deficiencies in control room logs. The licensee independently noted deficiencies. The licensee also noted errors in a new revision to the non-licensed operator rounds sheets (Section O3.2).

- Usually, the control room staff was aware of plant issues. However, an additional instance of operators unaware of failed control room indication was identified. There were no consequences due to this instance (Section O4.1).

- Generally, non-licensed operators performed their rounds correctly. However, the inspectors identified a variety of equipment deficiencies that indicated inattention to detail by the non-licensed operators during rounds. The licensee's events screening committee failed to direct investigation into the reasons why the non-licensed operators did not identify the equipment deficiencies (Section O4.2).

Maintenance

- Maintenance activities were generally performed by knowledgeable plant personnel in accordance with plant procedures. The inspectors did not identify any concerns in this area (Section M1.1).

- The licensee's initial response to inspection criteria failures of Limitorque SMB-3 actuators was poor. The licensee had not initiated a trend investigation of these failures until prompted by the inspectors. The licensee had not expedited the inspection schedule commensurate with the safety significance of the valves. The licensee disagreed with the inspectors on this point. Past motor operated valve actuator failures had not prompted the licensee to include additional specific motor pinion gear key information in work instructions, inspection procedures, or training material (Section M2.1).

Engineering

- The licensee performed an effective critique of the Unit 2 high pressure coolant injection mini-outage (Section E1.2).

Plant Support

- The inspectors identified inappropriate radiation protection practices and confusing contaminated boundary postings associated with the chimney radiation monitor (Section R4.1).

- Generally, the survey maps appeared accurate. The licensee identified one expired survey map. The significance was minor since the area dose rates had not appreciably changed (Section R4.2).

Report Details

Summary of Plant Status

Unit 2 began this inspection period at approximately 50 percent power due to concerns with computers operating in the year 2000. The unit returned to full power shortly afterwards. On January 15, 2000, the licensee conducted an unplanned load drop of approximately 75 percent due to vibration and leak concerns on the electro-hydraulic control system. Also, on February 13, 2000, the operators reduced power to 300 MW to make repairs to the electro-hydraulic control system.

Unit 3 operated at full power during this inspection report period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

Using Inspection Procedure 71707, the inspectors conducted frequent reviews of plant operations. In general, the conduct of operations was professional and safety-conscious; specific events and noteworthy observations are detailed in the sections below.

During the inspection period, the following event occurred that required prompt notification of the NRC per 10 CFR Part 73.71.

2/7/00 (Units 2, 3) Undermanned Security Force (Retracted - 2/11/00)

O1.2 General Observations

a. Inspection Scope (71707)

The inspectors performed routine observations of control room activities and assessed compliance with procedures, response to abnormal conditions, performance of shift turnover, and other activities.

b. Observations and Findings

The inspectors determined that the performance of the operators was generally good. Operators followed procedures, practiced good communications, and were attentive to the control room panels. The inspectors noted that operators usually documented issues and concerns in the corrective actions process via a Problem Identification Form (PIF). Shift turnovers were generally informative and provided sufficient information .

The inspectors noted that an operator misunderstood the applicability of the Technical Specifications for the Unit 3 isolation condenser. The isolation condenser was

inoperable due to a Group 5 isolation signal caused by planned maintenance. The inspectors noted that the licensee had captured this condition incorrectly on the turnover sheets and incorrectly had listed the isolation condenser as being controlled by the Dresden Administrative Technical Requirements. However, the licensee had correctly recorded the Technical Specification Limiting Condition for Operation for the inoperable isolation condenser in the Unit Supervisor's log. In discussing this discrepancy with an operator, the inspectors found that the reactor operator erroneously concluded that the item was a Dresden Administrative Technical Requirement solely because of the information on the turnover sheet.

The inspectors observed portions of operational activities that impacted or interfaced with the control room and concluded that the activities were appropriately coordinated. The inspectors verified that surveillance tests on the emergency diesel generators, the high pressure coolant injection system, and the core spray systems were performed in accordance with the Technical Specifications. No significant issues were identified by the inspectors.

c. Conclusions

The operators followed procedures, practiced good communications, and conducted informative turnovers. The inspectors noted one issue regarding an operator's misunderstanding of the status of plant equipment.

O1.3 Control Room Observations During Year 2000 Rollover (Units 2 & 3)

a. Inspection Scope (71707)

The inspectors performed detailed control room observations during the New Years Eve 2000 date change. These observations were performed to look for any computer-related problems that might have affected safe operation of the plant. The inspectors also performed walkdowns of the station technical support center and observed licensee staffing efforts in support of the date rollover.

b. Observations and Findings

The operations staff prepared for the date change by stationing extra personnel in the main control room and in the field. The licensee topped off diesel fuel tanks and verified that other consumable items were adequately stocked. The licensee also manned the technical support center with management personnel to address any potential problems with the units.

The inspectors noted that the date rollover from 1999 to 2000 was uneventful and had no impact on the operation of the units. No grid instability concerns were identified or observed from the main control room. Immediately after the rollover, the licensee performed checks of plant equipment to identify any hidden computer related problems.

During main control room (post rollover) planned instrument and recorder checks, several non-safety recorders exhibited an unknown error code. When technicians checked the date function, an alarm code was generated. The alarm code did not represent a significant problem. The recorders did not lock up and functioned and tracked normally otherwise. The issue had no affect on plant operations.

c. Conclusions

The licensee safely prepared for the 1999 to 2000 (Y2K) rollover. The plant experienced no significant computer-related problems during the transition. Licensee personnel identified several minor deficiencies with the date function in balance-of-plant recorders in the main control room.

O2 Operational Status of Facilities and Equipment

O2.1 Equipment Status and Impact

a. Inspection Scope (71707)

The inspectors toured portions of the plant and assessed the overall status of safety and risk significant structures, systems, and components (SSCs), and reviewed the licensee's actions for deficient conditions.

b. Observations and Findings

Generally, the inspectors identified no plant activities that may have adversely affected the operability of the required risk significant structures, systems, and components (SSCs). The inspectors noted that usually the licensee identified degraded components and entered the conditions in the corrective action process. Some concerns regarding the licensee's identification and resolution of degraded equipment are further discussed in Sections O2.2, O4.1, and M2.1.

The inspectors assessed the licensee's performance in addressing the following deficient equipment conditions:

* A generic issue of improperly assembled motor operated valves resulted in several safety-related motor operated valves failing inspection criteria. Although the valves were degraded, the valves remained operable. Specific concerns regarding the licensee's resolution to motor operated valve problems are further discussed in Section M2.1.

* The licensee responded to leakage and vibration problems on the Unit 2 electrohydraulic control system. On two occasions the licensee reduced power on Unit 2 to investigate and make repairs to the system.

* The licensee identified that the 3A low pressure coolant injection system heat exchanger had a tube leak. As a result, the licensee subsequently performed an operability evaluation. The licensee concluded that the low pressure coolant injection system remained operable. The timeliness of this evaluation is discussed in Section O2.2.

* The inspectors identified that the licensee had tied open access doors to the filters on the turbine building ventilation system and on the reactor building ventilation system for both units. The licensee concluded that the doors' positions were not adequately controlled, and considered this (the reactor building) to be a "configuration control" event. The licensee had opened the doors because a buildup of snow had blocked the intake. As a result of opening the doors, the systems would take suction from the turbine building instead of directly from the atmosphere. Although the doors were not controlled according to administrative procedures, the doors were not safety-related, and the issue was considered minor.

The inspectors observed portions of the restoration to service of the high pressure coolant injection system, the low pressure coolant injection system, and the emergency diesel generators. The inspectors independently verified that the equipment was operated within the expected parameters for running and standby operations. The inspectors verified that significant valves, breakers, and power supplies in the systems were in the correct positions. The inspectors did not identify any concerns.

c. Conclusions

Overall, the inspectors identified no concerns with risk-significant items. However, the material condition of the electrohydraulic control system caused the licensee to reduce power to investigate and repair the system. The licensee took actions to address degraded conditions with the Unit 3A low pressure coolant injection system heat exchanger and various safety-related motor operated valves.

O2.2 Low Pressure Coolant Injection (LPCI) Heat Exchanger (Unit 3)

a. Inspection Scope (71707)

The inspectors evaluated the licensee's response to a degraded condition of the Unit 3A LPCI heat exchanger.

b. Observations and Findings

On January 11, 2000, the licensee completed planned maintenance on both divisions of the Unit 3 LPCI system. Maintenance activities consisted of repairing a leaking check valve in the emergency core cooling system keep fill line. After returning the system to service, non-licensed operators noted that the differential pressure between the shell

and tube side of the LPCI heat exchanger was not being maintained. The LPCI heat exchanger was designed such that the cooling medium (tube side) of the heat exchanger is supplied from the safety-related containment cooling service water (CCSW) system. The CCSW system represents a potential pathway for contamination to leak into the environment via the service water system. Therefore, the LPCI heat exchangers are required to operate at a twenty-pound pressure differential between the tube side and the shell side (tube side higher). In response to this issue, the licensee increased the frequency in which the non-licensed operators vented the heat exchanger from "as-needed" to daily.

On January 18, 2000, the LPCI system engineer directed operating personnel to start recording as-found pressure data as part of shiftly rounds. A two day trend showed a relatively rapid rate of pressure equalization between the shell and the tube side of the LPCI heat exchanger. Also, as part of the LPCI system investigation, chemistry personnel drew water samples from the shell side of the heat exchanger. On January 21, 2000, the engineer informed the inspectors that initial sample results showed that there was tube leakage in the 3A LPCI heat exchanger. The sample results showed that conductivity of the water in the 3A LPCI heat exchanger was more than three times higher than the 3B LPCI heat exchanger. The results also showed that the sulfate level was more than twenty-five times higher. According to the licensee, the sample results were discussed formally with operations, chemistry, and engineering staffs on January 24, 2000.

On January 26, 2000, the licensee drew confirmatory samples from the LPCI heat exchangers. The results of these samples were similar to the previous sample result. On January 28, 2000, after completing DOS 1500-09, "LPCI Heat Exchanger Tube Leak Test," which showed rapid pressurization of the shell side of the heat exchanger, operating staff directed that an operability determination be completed. On February 2, 2000, the licensee completed the operability evaluation (Operations Evaluation 2000-006), which concluded that the 3A LPCI Heat Exchanger was operable, but degraded.

The inspectors questioned the timeliness of the operability determination process. In Section 1.0, "Expectations," of Nuclear Station Procedure (NSP)-CC-3001, "Operability Determination Process," Revision 2, the licensee stated that:

"The process of ensuring OPERABILITY is continuous. Once a DEGRADED or NONCONFORMING condition of a SSC is identified, a PROMPT OPERABILITY DETERMINATION should be made as soon as possible consistent with the safety importance of the SSC affected. In addressing timeliness of OPERABILITY DETERMINATIONs, Generic Letter 91-18 provides: "In most cases, it is expected that the decision can be made immediately (e.g., loss of motive power, etc). In other cases it is expected the decision can be made within approximately 24 hours of discovery even though complete information may not be available."

In this case, operators had progressively increasing knowledge of a DEGRADED condition of the 3A LPCI heat exchanger from January 11, 2000, and did not enter this issue into the Operability Determination process as described in NSP-CC-3001 until January 28, 2000.

Dresden Technical Specification 6.8.A states in part, that written procedures shall be established, implemented, and maintained covering the activities referenced in Appendix A, of Regulatory Guide 1.33, Revision 2, February 1978. Appendix A references administrative procedures affecting safety-related components.

Contrary to the above, from January 11 to January 28, 2000, the licensee did not enter the known degraded condition of the 3A LPCI heat exchanger into the operability determination process, as required by NSP-CC-3001. This Severity Level IV violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1.a of the NRC Enforcement Policy **(NCV 50-249/1999023-01(DRP))**. This issue is in the licensee's corrective action program as PIFs D2000-00483 and D2000-00514.

c. Conclusions

The inspectors concluded that operations staff did not make a timely operability determination when a degraded condition of the 3A LPCI heat exchanger was identified. This issue was initially identified by non-licensed operators as early as January 11, 2000. However, the licensee did not initiate an operability determination until January 28, 2000. This issue is considered a non-cited violation.

O3 Operations Procedures and Documentation

O3.1 Technical Specification Required Surveillance Activities

a. Inspection Scope (61726)

The inspectors observed the following surveillance tests for compliance with procedural and regulatory requirements:

DOS 6600-02	Unit Two/Three Diesel Generator Monthly Operability Surveillance.
DOS 7500-02	Standby Gas Treatment System Operability Surveillance
DOS 2300-3	Unit 3 High Pressure Coolant Injection System
DOS 1100-04	Unit 3 Standby Liquid Control System Quarterly In-Service Test

b. Observations and Findings

The periodicities of the surveillances were compared to the minimum periodicity required per Technical Specification Limiting Condition for Operation surveillance requirements. The surveillance acceptance criteria listed in the procedure for each surveillance met the intent of the technical specification requirements. The inspectors reviewed the completed surveillance data to ensure the surveillances met their acceptance criteria and were administratively correct. No problems were identified. At the completion of the surveillance, system alignment was returned to normal and independent verification of system status verified system restoration. Test instruments used were verified to be in the calibration program and were currently calibrated. Repositioned locked valves were verified by the inspectors to be in their proper position.

For equipment removed from service for surveillance testing, the inspectors verified that the proper Technical Specification Limiting Condition for Operation was entered and that the applicable time limit was not exceeded.

c. Conclusions

Surveillance tests were completed in a timely manner, met surveillance acceptance criteria, and the tested components remained operable.

O3.2 General Observations

a. Inspection Scope (71707)

The inspectors reviewed control room logs and daily orders to understand the activities and events that occurred.

b. Observations and Findings

Log Keeping

Normally, the control room logs were of sufficient detail to document significant plant activities. At the beginning of the inspection period, the inspectors identified weak control room log keeping. In particular, the inspectors noted that the operators were not recording power changes in the logs. The licensee documented this in PIF#D2000-00093. Independently, the licensee's Nuclear Oversight organization noted weak log keeping when the organization identified that not all entries and exits for technical specification limiting conditions for operations were being logged. The licensee issued a separate PIF to document this concern.

Procedure Use

Routine control room and field observations by the inspectors identified no concerns with procedure use or adequacy.

Procedure Adequacy

During this inspection period, the licensee revised the procedures used for the routine area walkdowns of the reactor building, turbine building, and other areas. A non-licensed operator wrote a PIF to document that the revised rounds sheets did not appear to meet the standards of the operations department. The inspectors used the sheets to perform walkdowns of the plant and noted issues such as a wrong-unit listing and variations in equipment description information. Other issues noted by the inspectors included a nonlogical sequence of the rounds and no entry into the emergency diesel generator day tank rooms to record tank levels.

Discussions with various operations staff revealed that the licensee had not actually walked down the new integrated round procedures before implementation. The licensee considered the revisions to be of an administrative nature; therefore, the licensee was

not required administratively to conduct a walkdown of the rounds sheets. The inspectors concluded that the licensee missed an opportunity to identify deficient round information through a walkdown.

During the inspection period, the licensee revised the procedures again to incorporate feedback from the non-licensed operators. Shortly after the licensee released the revision, a non-licensed operator identified additional errors. Although there were errors in the procedures, the inspectors concluded that the errors did not make the procedures inadequate. At the end of the inspection period, operations management had assigned a team to perform a more thorough review and complete walkdown of the rounds procedures.

c. Conclusions

The operations procedures and documentation from the round sheets were generally acceptable. The operators usually used procedures in accordance with the licensee's requirements. However, the inspectors noted deficiencies in control room logs. The licensee independently noted deficiencies. The licensee also noted errors in a new revision to the non-licensed operator rounds sheets.

O4 Operator Knowledge and Performance

O4.1 Control Room Performance

a. Inspection Scope (71707)

The inspectors evaluated the control room operators' attentiveness and responsiveness to plant conditions, and assessed the operators' understanding of plant issues.

b. Observations and Findings

In general, the operators were knowledgeable of overall plant status. The operators responded correctly to unusual plant conditions or parameters, and the inspectors directly observed the operators reference annunciator response procedures. The inspectors' routine reviews of work in progress and work planned with the operators identified no knowledge weaknesses except for the isolation condenser issue previously discussed in Section O1.2. The turnovers observed were informative and contained relevant information.

Failed Control Room Indication and (Closed) URI 99021

The inspectors noted that the Unit 3 LPCI system total flow recorder FR 3-1540-7 (which reads both Division 1 and Division 2) was in the Unit 3 abnormality log because Division 2 indicated approximately 130 gallons per minute without any pumps running. In discussions on February 10, 2000, control room operators were uncertain if the total flow recorder was operable, but the shift manager informed the inspectors that the recorder was operable.

In follow-up discussions with operations and engineering staff on February 11, 2000, the engineers showed the shift manager that the flow recorder had failed its last surveillance in late 1998. The degraded flow recorder was first identified by the licensee in January 1997. Planned corrective action was documented on engineering request 9801544, but had not been completed.

The shift manager then declared the flow recorder inoperable. The shift manager concluded that the failure of the flow recorder did not affect LPCI operability because the recorder was not needed for the LPCI system to perform its intended safety function. The inspectors reviewed the impact of the flow recorder being inoperable and concluded that the recorder would not have prevented proper operation of the LPCI system, and the LPCI system remained operable. Following discussions with the inspectors, the licensee updated the information in the abnormality log to specify that the total flow indication was inoperable.

The issue of operators not being aware of failed control room indications was discussed in Inspection Report 99021. In that instance, the control room staff was not aware that the 2(3)-2599-26A/B excess flow check valves were indicating falsely. The NRC captured this issue in Unresolved Item 50-237/99021-01. Followup investigation revealed that the indications were safety-related; however, no actions were required to be taken based on the check valve indications. The licensee repaired the indications during this inspection period.

The inspectors considered the operator knowledge of the operability of the LPCI system total flow recorder to be similar to unresolved issue 99021-01. In both instances, the operators were unaware of the actual failure of indications in the control room. The inspectors did not consider enforcement action for the LPCI recorder problem because the flow indicator was not safety-related. Regarding unresolved item 99021-01, the inspector concluded the issue was minor since no action was required based on the indication. **URI 99021-01 is closed.**

c. Conclusions

Usually, the control room staff was aware of plant issues. However, an additional instance of operators unaware of failed control room indication was identified. There were no consequences due to this instance.

O4.2 Field Performance

a. Inspection Scope (71707)

The inspectors assessed the performance of non-licensed operators based on direct observations and items not identified by the operators while conducting their rounds.

b. Observations and Findings

The inspectors observed the performance of non-licensed operators during routine operations. The inspectors did not identify any concerns.

The operators appropriately identified most equipment deficiencies using action request tags. However, during the inspection period, the inspectors identified various deficient conditions and issues with plant equipment that had not been identified by the licensee. The licensee documented these issues in PIFs. These issues included low oil level on a core spray pump, failed instrumentation on the service air system and instrument air system, low pressure in a control rod drive accumulator, and tied-open reactor building ventilation. Some of these items, such as the core spray pump oil level, were on the rounds sheets and should have been identified by the non-licensed operators. Other items were not specific line items on the rounds sheets, but were within the condition of plant equipment monitored while conducting rounds. The number of plant deficiencies missed by the operators but identified by the inspectors indicated a lack of attention to detail by operators when conducting rounds.

The inspectors noted that the events screening committee was not very challenging in dispositioning these PIFs. The event screening committee focused only on ensuring notification of the inspectors of the station's implemented corrective actions, instead of focusing on the non-licensed operators' failure to identify these deficient conditions.

c. Conclusions

The inspectors concluded that generally the non-licensed operators performed their rounds correctly. However, the inspectors identified a variety of equipment deficiencies that indicated inattention to detail by the non-licensed operators during rounds. The licensee's events screening committee failed to direct investigation into the reasons why the non-licensed operators did not identify the equipment deficiencies.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (62703)

During the inspection period, the inspectors observed a number of maintenance related activities involving either routine plant maintenance or corrective maintenance evolutions. These activities included, but were not limited to, the following observations:

WR 990132027	Logic Troubleshooting of Circulating Flow Reversal System
WR 990032184	3A Instrument Air Compressor 2Y Preventive Maintenance
WR 990127583	2B Electro-Hydraulic Pump - Leak Repair
WR 990131021	Unit 2/3 Diesel Generator Engine Fuel Line Leak Repair
WR 990062673	Unit 2/3 Standby Gas Treatment System PM
WR 980039949	Unit 2 HPCI Motor Gear Unit Signal Converter
WR 980072828	Unit 3A Low Pressure Core Spray 2Y EQ Surveillance
WR 990120422	Unit 2A Condensate Booster Pump seal leak

The inspectors reviewed project work scope, work instruction requirements, specific work requirements and other pertinent information necessary to perform on- line maintenance evolutions. The inspectors also discussed work in progress, on location, with cognizant field supervision.

b. Observations and Findings

The inspectors observed the work ongoing at several job locations through out both Unit 2 and Unit 3. The inspectors determined that station personnel had work packages at or near the work site and used the work packages properly. Supervisors were normally present at the work site directing activities. The inspectors observed the performance of several specific work activities. Plant personnel normally followed safety precautions, were knowledgeable of the activity, and answered questions the inspectors had regarding the work. Also, plant personnel generally left the work areas clean.

Field work was generally accomplished with few cases of rework and the post-maintenance testing reflected the correctness in execution of the field work.

c. Conclusions

The inspectors concluded that the maintenance activities were generally performed by knowledgeable plant personnel in accordance with plant procedures. The inspectors did not identify any concerns in this area.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 (Unit 2, 3) Limitorque SMB-3 Motor Operated Valve (MOV) Maintenance

a. Inspection Scope (61726, 62707)

The inspectors evaluated the licensee's effort in addressing a negative trend of failed inspection on Limitorque SBM-3 MOV actuators during planned valve maintenance.

b. Observations and Findings

Background Information

On July 10, 1999, the Unit 3 isolation condenser condensate return valve failed a technical specification required quarterly valve timing surveillance test. The control room operators could not remotely operate the valve. Subsequently, the licensee discovered that the valve actuator's motor pinion gear was loose on the shaft and the drive key had fallen out.

The licensee documented this failure in Licensee Event Report (LER) 50-249/99005 "Isolation Condenser Inoperable Due to Valve Actuator Motor Pinion Key Becoming Dislodged." In this LER, the licensee concluded that maintenance personnel failed to complete the appropriate procedural steps during refurbishment and installation of this

valve. The licensee also concluded that there was a lack of knowledge regarding the proper method of securing the motor pinion gear key on the shaft.

As part of the corrective actions for this event, the licensee identified the population of safety-related SMB-3 actuators in the plant. The licensee determined that there was a total of twenty-eight safety-related SMB-3's at Dresden (14 per unit). The licensee then added inspections of each of the safety-related SMB-3 actuator's motor pinion gears to the work scope of scheduled system maintenance outages.

Since July 1999, the licensee had inspected twelve of the twenty-eight SMB-3 actuators. As of February 11, 2000, the licensee's inspection efforts had found six actuators that failed the inspection criteria (not properly staked). Although the valves failed the inspection criteria, the valves still remained operable. The following is a summary of the valves inspected and the failures found.

Valve Number	Description	System's PRA Risk	Condition Found
2-1001-02B	Shutdown Cooling Pump Suction Valve	Low	Motor pinion gear was found mispositioned. Motor terminal block was damaged.
3-1001-2A	Shutdown Cooling Pump Suction Valve	Low	Lockwire for set screw on the motor pinion gear was not installed. Set screw and pinion gear loose. No spot drill on motor shaft for set screw. Wrong type motor pinion key used (longer than procedures allowed).
2-1304-4	Iso Condenser- Inboard Condensate isolation Valve	Medium	Found spot drill on motor shaft for pinion gear on wrong side of shaft, and damaged motor lead. Set screw had wrong tip shape.
2-2301-3	HPCI Steam Supply Valve	High	Found Spot drill on motor shaft improperly drilled to capture set screw. Key recessed improperly.
2-2310-10	HPCI Condensate Test Return Line	Low	Motor pinion gear was found loose and coming off shaft and key was sticking half way out. Set screw was wrong type/size and dimple (spot drill) in motor shaft was in the wrong place.
3-1301-3	Iso Condenser-Outboard Condensate Return Valve	High	Pinion gear was found loose. Gear key sticking inch out of shaft. Set screw not drilled of set properly.

Inspector Concerns

After reviewing the results of the inspections and reviewing the licensee's valve maintenance program with respect to Limitorque SMB-3 actuators, the inspectors noted several concerns.

<u>Concern #1</u> Valve Inspection Schedule not Commensurate with Inspection Results

After the July 1999 event, the licensee scheduled the valve inspections such that they would be completed by mid-2001.

During the Unit 2 outage in November 1999, the licensee found that the high pressure coolant injection system supply isolation valve 2-2301-3 was deficient (see previous Table). During that same time the licensee found that the Unit 2 condenser circulating flow reversing valves had incorrect installation of the motor pinion gear. The circulating flow reversing valves are not safety related. However, the malfunction of these valves could cause a plant transient through the loss of main condenser vacuum. Four of the six entries in the table above occurred between the July 1999 and January 2000 time frame. Despite these inspection results, the licensee had not expedited the inspection of motor operated valve actuators. The inspectors questioned the licensee as to whether the inspection schedule was commensurate with the number of valves that had failed inspection criteria and the safety significance of the valves. The licensee rescheduled the valve inspections such that inspections would be complete by June 15, 2000.

Concern #2 No Trend Investigation Started by the Licensee to Identify Programmatic Deficiency Until Prompted by the Inspectors.

Through interviews with the engineering and maintenance staff, the inspectors discovered that despite the high percenatage of inspection failures, a trend investigation had not been started. Following the inspectors' questions, the licensee wrote a PIF documenting unsatisfactory inspections on motor operated valves with SMB-3 Limitorque actuators (Ref. PIF D2000-00636).

Concern #3 No Detailed Procedural Updates or Enhancements of the Valve Maintenance Procedure or Training Material.

The inspectors' review of Dresden Electrical Maintenance Procedure (DEP) 40-09 "Limitorque Valve Operator Maintenance," Revision 9, determined that the instructions reflected the vendor's manual. However, the inspectors determined that the number of failed valve inspections and the various types of failure mechanisms indicate work instructions may not be sufficient to prevent the deficient conditions with the MOVs.

Between September 1998, and the July 10, 1999, failure, the licensee documented other SMB-3 issues. On September 24, 1998, the licensee documented in PIFs D1998-05293 that the Unit 3 HPCI steam addition valve would not operate manually. The licensee's investigation found that the motor pinion gear was very loose on the shaft and was interfering with the declutch fork. This interference prevented the declutch fork from engaging the actuator's tripper fingers, which prevented the valve's manual operation. The licensee documented a second motor operated valve failure due to inadequate staking of the motor pinion gear key for the 3-1301-2 valve actuator (outboard containment isolation valve) in PIFs D1998-05424 and 05401. This failure rendered the isolation condenser inoperable.

The licensee's root cause investigation for these events determined that the failures were due to an inadequate receipt inspection procedure performed in 1988. This procedure did not contain specific instructions for inspecting the motor pinion gear. The

inspectors noted that the licensee had performed routine valve maintenance on these valves since 1988 with inspections of the motor pinion gear using DEP 40-09. The inspectors determined that these inspections were not successful in finding the deficiencies. Therefore, the inspectors concluded that other DEP 40-09 inspections may have also been deficient based on the subsequent number of valve discrepancies.

The inspectors also noted a weakness in the licensee's motor operated valve maintenance training module. In NRC Information Notice 94-10: Failure of Motor-Operated Valve Electric Power Train Due to Sheared or Dislodged Motor Pinion Gear Key, the NRC documented that all SMB and SB type actuators were susceptible to these problems. Also, Limitorque discussed this issue in Maintenance Update 89-1. Despite this available documentation, the training module did not contain specific instructions or training on how to inspect or install the SMB-3 motor pinion gear shaft key. The inspectors noted that the "Operating Experience" information contained in the training module did not contain actual Dresden events. The module referenced motor operated valve issues from 1996 at a different plant.

c. Conclusions

The inspectors concluded that the licensee's initial response to inspection criteria failures of Limitorque SMB-3 actuators was poor. The licensee had not initiated a trend investigation of these failures until prompted by the inspectors. The inspectors determined that the licensee had not expedited the inspection schedule commensurate with the safety significance of the valves. The licensee disagreed with the inspectors on this point. The inspectors also noted that past motor operated valve actuator failures had not prompted the licensee to include additional specific motor pinion gear key information in work instructions, inspection procedures, or training material.

III. Engineering

E1 Conduct of Engineering

E1.2 Engineering Department Personnel Captured HPCI Outage Lessons Learned

a. Inspection Scope (71707)

The inspectors assessed the licensee's critique of the recently completed Unit 2 high pressure coolant injection (HPCI) mini-outage.

b. Observations and Findings

The inspectors attended HPCI outage critique meetings that were headed by system engineering department personnel. The meetings were used to discuss challenges with parts availability, resource allocation, and emergent work. Also, the licensee planned to incorporate the lessons learned from the Unit 2 HPCI outage into a database. As a result of the Unit 2 HPCI critique, the licensee decided to delay the Unit 3 HPCI outage,

which had been scheduled to start immediately after the Unit 2 HPCI outage, to ensure all lessons learned had been completely incorporated into the appropriate processes.

c. Conclusions

The inspectors concluded that the licensee performed an effective critique of the Unit 2 high pressure coolant injection mini-outage.

E8 Miscellaneous Engineering Issues

E8.1 (Closed) LER 50-237/98002-00: Unit 2 Reactor Scram from a Main Turbine Trip Due to Inadequate Design Review Performed During Modification. On January 13, 1998, with Unit 2 operating at 100 percent power, a reactor scram was caused by a main turbine trip. This issue was discussed in Inspection Report 98003, and Violation 50-237/249-98003-01a was issued for instructions not appropriate to the circumstance. No new issues were identified during review of the LER. The LER is closed.

IV. Plant Support

R4 Staff Knowledge and Performance in Radiological Protection and Chemistry (RP&C) Controls

R4.1 Inappropriate Radiation Protection Practices

a. Inspection Scope (71750)

The inspectors observed a health physics engineer perform the monthly surveillance on the 2/3 main chimney radiation monitor.

b. Observations and Findings

On February 4, 2000, the inspectors observed a health physics engineer perform Dresden Radiation Surveillance 5821-22, "Unit 2/3 G.E. Plant Chimney Radiation Monitor Source Check," Revision 0. The surveillance required the health physics engineer to attach a radioactive source to the bottom of each monitor's detector and verify that the monitor was operable.

The 2/3 chimney monitor was located inside a contaminated area which had been established by two contaminated boundary postings. Radiation protection personnel had erected one contaminated boundary posting on an angle, which had resulted in some hard piping, valves, and tygon tubing crossing the boundary. The tubing was used by chemistry personnel to obtaine routine samples and had not been properly secured to prevent the spread of contamination. The inspectors questioned the health physics engineer on the appropriateness of this as-found condition of the tygon tubing. The health physics engineer informed the inspectors that the tubing should have been secured and that the condition would be reported to radiation protection management.

Radiation protection personnel had placed the second posting approximately two feet off the floor, in front of the 2/3 chimney monitor detector housing. In performing this surveillance, the health physics engineer, having donned rubber gloves, reached across the contaminated posting to retrieve a detector out of the detector housing. The engineer moved the detector across the boundary, and placed the it on a clean area, to attach the source. The inspectors questioned the health physics engineer on the procedural requirements for allowing equipment inside a contaminated boundary to cross its contaminated boundary without performing any smears on the equipment. The health physics engineer initially informed the inspectors that the contaminated posting only applied to the bottom of the detector housing. However, upon further discussions on proper radiological protection practices with the inspectors, the health physics engineer agreed that the posting was not conducive to good radiological protection practices. The health physics engineer said that he would inform the radiation protection staff of the confusing posting.

The licensee implemented the following corrective actions: (1) performed a survey of the area which did not reveal any contamination; (2) replaced the posting in front of the detector housing with a stanchion posting that was approximately 5 feet off the floor; (3) secured the tygon tubing within the contaminated area; (4) generated a PIF to document the as-found deficient conditions of the 2/3 chimney radiation monitor; and (5) generated a second PIF to address the as-left conditions of having chemistry equipment both inside and outside a contaminated area.

The inspectors considered the licensee's corrective actions appropriate. In addition, the inspectors considered that the safety significance was minimal since all contamination remained within the contaminated area boundary.

c. Conclusions

The inspectors identified inappropriate radiation protection practices and confusing contaminated boundary postings associated with the chimney radiation monitor.

R4.2 Area Survey Map Not Updated

a. Inspection Scope (71750)

The inspectors toured radiologically controlled areas of the plant to determine whether plant workers and radiation protection personnel were following the licensee's procedures for radiation protection.

b. Observations and Findings

In general, the inspectors noted few concerns with radiation survey maps. However, on February 6, 2000, a non-licensed operator on rounds identified that the general area survey for the Unit 2 turbine building had expired. Numerous personnel from maintenance, security, radiation protection, and operations had already entered the turbine building without identifying that the survey map was expired even though these individuals were supposed to review the survey map before entry. The actual safety

significance was minor because the dose rates in the area had not appreciably changed.

Subsequently, the radiation protection personnel documented the expired survey map in PIF #D2000-00721. When the events screening committee reviewed the PIF, the committee did not discuss why personnel had failed to identify the expired survey map before entering the radiologically controlled area. The inspectors and station management subsequently discussed the concern of personnel not performing a careful review of the survey maps. At the end of the inspection period, the radiation protection staff had not completed the final investigation into how the radiation protection department allowed the map to be out of date.

c. Conclusions

Generally, the survey maps appeared accurate. The licensee identified one expired radiological survey map. The significance was minor since the area dose rates had not appreciably changed.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management on February 15, 2000, following the conclusion of the inspection period. The licensee acknowledged the findings presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. The licensee identified no proprietary information. The inspectors met again with the licensee on February 24, 2000, and discussed the lack of timeliness for the operability evaluation of the LPCI heat exchanger.

PARTIAL LIST OF PERSONS CONTACTED

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