

January 18, 2002

Mr. Oliver D. Kingsley, President
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: DRESDEN NUCLEAR POWER STATION
NRC INSPECTION REPORT 50-237/01-20(DRP); 50-249/01-20(DRP)

Dear Mr. Kingsley:

On December 29, 2001, the NRC completed an inspection at your Dresden Nuclear Power Station, Units 2 and 3. The enclosed report presents the inspection findings which were discussed with Mr. P. Swafford and other members of your staff on December 27, 2001.

The inspection examined activities conducted under your license as they relate to safety and to compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel. Specifically, this inspection focused on resident inspection activities, occupational and public radiation safety, and maintenance rule program implementation.

Based on the results of this inspection, the inspectors identified four issues of very low safety significance (Green). Three of these issues were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they have been entered into your corrective action program, the NRC is treating these issues as Non-Cited Violations, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny these Non-Cited Violations, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspectors at the Dresden Nuclear Power Station.

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Sincerely,

/RA/

Mark Ring, Chief
Branch 1
Division of Reactor Projects

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

Enclosure: Inspection Report 50-237/01-20(DRP);
50-249/01-20(DRP)

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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: 50-237/01-20(DRP); 50-249/01-20(DRP)

Licensee: Commonwealth Edison Company

Facility: Dresden Nuclear Power Station, Units 2 and 3

Location: 6500 North Dresden Road
Morris, IL 60450

Dates: November 14 through December 29, 2001

Inspectors: D. Smith, Senior Resident Inspector
B. Dickson, Resident Inspector
A. Dunlop, Reactor Engineer
W. Slawinski, Senior Radiation Specialist
R. Zuffa, Illinois Department of Nuclear Safety

Approved by: Mark Ring, Chief
Branch 1
Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000237-01-20(DRP), IR 05000249-01-20(DRP), on 11/14/01-12/29/2001, Exelon Generation Company, Dresden Nuclear Power Station, Units 2 and 3. Access Controls for Radiologically Significant Areas, Liquid and Gaseous Effluent Releases and Event Follow-Up.

The inspection was conducted by resident inspectors, a senior radiation specialist, and a reactor engineer. The inspection identified four Green findings, three of which were Non-Cited Violations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at <http://www.nrc.gov/NRR/OVERSIGHT/index.html>.

A. Inspector Identified Findings

Cornerstone: Initiating Events

Green. Failure of the operators to maintain Unit 2 turbine first stage pressure within procedural limits and inadequate operations staff's management and oversight of the turbine shell warming evolution resulted in an initiating event (scram).

This issue was more than minor because it had an actual safety impact. However, because all mitigating systems were available at the time of the scram, this finding was considered to be of very low safety significance (4A03.2).

Cornerstone: Occupational Radiation Safety

Green. Two findings and associated Non-Cited Violations of Technical Specification 5.4.1 were identified for the failure to obtain a briefing from the radiation protection staff prior to entry into a posted high radiation area, and for the failure to properly establish a high radiation area barricade, as required by station procedures (NCV 50-237;249/01-20-01 and 50-237;249/01-20-02).

These findings were determined to be of very low safety significance because no individual actually entered an area with high radiation levels, radiological consequences were minimal, and the licensee's ability to assess worker dose was not compromised (2OS1).

Cornerstone: Public Radiation Safety

Green. A finding and associated Non-Cited Violation of Technical Specification 6.8.D(4) was identified for the failure to calibrate the radwaste liquid effluent radiation monitor to encompass the entire instrument response range including its alarm function (NCV 50-237;249/01-20-03).

This finding was determined to be of very low safety significance because proper instrument response and linearity to radiation was determined throughout most of the instrument's required response range, and because the licensee's ability to assess dose to the environment from liquid effluent releases was not impaired by the calibration problem (2PS1.4).

B. Licensee Identified Findings

No findings of significance were identified.

Report Details

Summary of Plant Status

On November 16, 2001, operators reduced load to approximately 700 MWe on Unit 2 due to a slowly decreasing cooling water flow rate for the main generator's stator. The unit was returned to 100 percent power on November 20, 2001. On December 16, 2001, the licensee reduced power to 300 MWe to obtain recirculation flow baseline data and performed feedwater testing. The unit was returned to full power on December 17, 2001. On December 27, 2001, the unit was reduced to 700 MWe for extended power uprate testing. The unit was returned to 95 percent of the new power level of 2975 MW thermal. The licensee made three percent power level increases on December 27, 28, and 29 and conducted feedwater level response and pressure control testing on each day.

Unit 3 started the inspection period at full power. On December 1, 2001, the unit was taken offline to enter the drywell to search for the source of increasing drywell leakage. Unidentified leakage had increased to three gallons per minute. The unit was returned online on December 4, 2001. Subsequently, the unit was shut down on December 11, 2001, due to the return of elevated drywell leakage. The unit was returned to full power on December 20, 2001.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather (71111.01)

a. Inspection Scope

The inspectors assessed the licensee's implementation of station procedures for the preparation and initiation of cold weather conditions.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignments (71111.04)

a. Inspection Scope

The inspectors selected a redundant or backup system to an out-of-service or degraded train, reviewed documents to determine correct system lineup, and verified critical portions of the system configuration. Appropriate meter indications were also observed. The inspectors observed various support system parameters to determine the operational status of the system. Control room and local meter indications for the systems were observed. Other conditions, such as adequacy of housekeeping, the absence of ignition sources, and proper labeling were also evaluated. The inspectors conducted a review of the Unit 2 and the Unit 3 250 VDC Battery systems.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

a. Inspection Scope

The inspectors toured plant areas important to safety to assess the material condition, operation lineup, and operational effectiveness of the fire protection system and features. The review included control of transient combustibles and ignition sources, fire suppression systems, manual fire fighting equipment and capability, passive fire protection features (including fire doors), and the compensatory measures. The following areas were walked down:

Unit 2 High Pressure Coolant Injection Room - Fire Zone 11.2.3
Unit 2 Reactor Water Clean Up System Area - Fire Zone 1.1.2.3
Unit 2 125 v Battery Room - Fire Zone 7.0.A.2
Unit 2 Emergency Diesel Generator Room - Fire Zone 9.0.A

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

a. Inspection Scope

The inspectors observed and assessed the performance of operators in the control room and in the simulator to identify deficiencies and discrepancies in performance and training. The inspectors also assessed licensed operator performance for operating crew #4 during "out-of-the-box" dynamics on December 21, 2001, and the evaluators' critiques following the dynamic examination. The scenarios included the following:

Scenario OF-Exam Q which included an inadvertent isolation condenser initiation, a failure of the reactor recirculation flow control system, and an unisolable steam leak on the isolation condenser in the reactor building (with a fuel element failure).

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (71111.12)

.1 Quarterly Review of Maintenance Rule Implementation

a. Inspection Scope

The inspectors assessed the licensee's implementation of the maintenance rule by determining if systems were properly scoped within the maintenance rule. The inspectors also assessed the licensee's characterization of failed structures, systems, and components, and determined whether goal setting and performance monitoring were adequate for the Unit 2/3 Feedwater System, Electronic Relief Valve, and Unit 2 Intermediate Range Monitors.

b. Findings

No findings of significance were identified.

.2 Biennial Maintenance Rule Implementation (71111.12B)

a. Inspection Scope

The objective of the inspection was to:

- Verify that the periodic evaluation was completed within the time restraints defined in 10 CFR 50.65, the maintenance rule (once per refueling cycle, not to exceed two years), ensuring that the licensee reviewed its goals, monitoring, preventive maintenance activities, industry operating experience, and made appropriate adjustments as a result of that review;
- Verify that the licensee balanced reliability and unavailability during the previous refueling cycle, including a review of safety significant structures, systems, and components (SSC);
- Verify that (a)(1) goals were met, corrective actions were appropriate to correct the defective condition including the use of industry operating experience, and (a)(1) activities and related goals were adjusted as needed; and
- Verify that the licensee has established (a)(2) performance criteria, examined any SSCs that failed to meet their performance criteria, or reviewed any SSCs that have suffered repeated maintenance preventable functional failures including a verification that failed SSCs were considered for (a)(1).

The inspectors examined the last two periodic evaluation reports for the time frames July 1, 1997, through February 28, 1999, and March 1, 1999, through September 30, 2000. To evaluate the effectiveness of (a)(1) and (a)(2) activities, the inspectors examined (a)(1) action plans, justifications for returning SSCs from (a)(1) to (a)(2), and a number of condition reports (CRs) (contained in the list of documents at the end of this report). In addition, the CRs were reviewed to verify that the threshold for identification of problems was at an appropriate level and the associated corrective

actions were appropriate. The inspectors focused the inspection and CR review on the following systems:

- High Pressure Coolant Injection
- 250 VDC Battery
- Instrument Air Systems

In addition, the inspectors reviewed three self-assessments that addressed maintenance rule implementation at Dresden.

b. Findings

No findings of significance were identified.

1R13 Maintenance Work Prioritization & Control (71111.13)

a. Inspection Scope

The inspectors evaluated the effectiveness of the risk assessments performed before maintenance activities were conducted on structures, systems, and components and verified how the licensee managed the risk. The inspectors evaluated whether the licensee had taken the necessary steps to plan and control emergent work activities. The inspectors reviewed maintenance activities on the Unit 2 Emergency Diesel Generator, Unit 3 High Pressure Coolant Injection and Unit 2 2B Containment Cooling Service Water Systems.

b. Findings

No findings of significance were identified.

1R14 Personnel Performance Related to Non-routine Evolutions and Events (71111.14)

a. Inspection Scope

The inspectors reviewed operator logs, problem identification forms, and alarm printer outputs associated with the slight power increase of less than 2.5 percent for the isolation of the Unit 3 Reactor Water Cleanup System during valve timing on November 27, 2001, and automatic start of the 2A Condensate Booster Pump on November 15, 2001, due to low reactor feed pump suction pressure. The inspectors interviewed operations, maintenance, and engineering personnel concerning the cause of these plant perturbations.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed operability evaluations to ensure that operability was properly justified and the component or system remained available, such that no unrecognized increase in risk occurred. The review included issues involving the operability of the Unit 3 standby liquid control systems relief valve.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the following post-maintenance test results to confirm that the tests were adequate for the scope of the maintenance being performed, that the test data met the acceptance criteria. The inspectors also determined that the test restored the systems to the operational readiness status which was consistent with the design and licensing basis documents. The inspector reviewed work activities associated with the standby gas treatment system time delay relay replacement and repairs on the air operated valve.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities (71111.20)

a. Inspection Scope

The inspectors reviewed and evaluated several outage activities during two Unit 3 forced outages to identify an increasing drywell leakage on December 3, 2001, and subsequently on December 11, 2001. The evaluation was performed to ensure that the licensee appropriately considered risk factors during the development and execution of planned activities. The inspectors also ensured that Technical Specification requirements were verified to have been met for changing modes.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed surveillance testing on risk-significant equipment. The inspectors assessed whether the selected plant equipment could perform its intended safety function and satisfy the requirements contained in Technical Specifications. Following the completion of the test, the inspectors determined that the test equipment was removed and the equipment returned to a condition in which it could perform its intended safety function. The review included surveillance testing activities for the Pre-Extended Power Uprate, Post-Extended Power Uprate and the Reactor Recirculation System.

b. Findings

No findings of significance were identified.

3. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Controls for Radiologically Significant Areas (71121.01)

.1 Follow-up of High Radiation Area Access Control Problem

a. Inspection Scope

The Region III Plant Support Branch (PSB) staff reviewed the results of the licensee's investigation into high radiation area access controls during the loading of a radioactive waste liner and shipping cask in the Radioactive Waste (Radwaste) Building. The PSB staff performed an in-office review of the licensee's investigative report to assess its adequacy, additional information was obtained from the Dresden Station radiation protection staff in a follow-up telephone conversation, and station procedures relevant to the issues were independently assessed for compliance.

b. Findings

The licensee's review identified procedure compliance issues associated with high radiation area access controls during the loading of the liner in a shipping cask. The PSB staff evaluated the results of the licensee's investigation. Two Green Findings and associated Non-Cited Violations (NCVs) were identified.

On July 23, 2001, condition report (CR) No. 2001-03847 was generated to document high radiation area access control issues that occurred that day. The issues involved an individual that stepped over a high radiation area rope boundary without authorization from the radiation protection (RP) staff, shortly after a liner was loaded into a shipping cask and as the lid to the cask was being set. However, the licensee's evaluation of that CR was inadequate because it failed to identify procedure violations associated with the

incident. The compliance issues were not identified by the licensee until a subsequent review was prompted by the NRC. The licensee's evaluation identified that the initial review of the CR was not sufficiently objective or probing.

The licensee's evaluation of the concerns identified that an individual did not obtain a briefing or approval from RP prior to entering an area posted as a high radiation area. The individual's actions were contrary to the posting established for the cask loading area which stated "RP Brief Required for Entry." The licensee's review also identified that the high radiation area boundary established for the area was not adequate because a swing gate or turnstile was not used as the barricade at the entrance to the high radiation area, and an access control guard was not assigned to the area in lieu of the barricade options.

This issue, if not corrected, would become a more significant concern and could cause an unintended radiation exposure to personnel who fail to heed high radiation area postings and controls, or because radiological boundaries were not properly established. Therefore, the issue represents a finding which the PSB evaluated using the NRC Significance Determination Process (SDP) for the occupational radiation safety cornerstone. The finding was not associated with an ALARA program issue, dose consequences were minimal because the actual area radiation levels were less than 100 mrem/hour when the individual entered the area, and the licensee's ability to assess dose was not impacted. Consequently, the PSB staff concluded that the issue was of very low safety significance (Green).

Technical Specification 5.4.1 requires, in part, that procedures be established, implemented and maintained that cover the activities recommended in Regulatory Guide 1.33, Revision 2, Appendix A, which included RP procedures for the control of access to radiological areas. Dresden Radiation Protection procedure DRP 5010-1, "Radiological Posting and Labeling Requirements," Revision 9, requires in Section F.8, that personnel entering any radiologically posted area read and comply with all associated postings. Additionally, Section 5.1.2 of administrative procedure RP-AA-460, "Controls for High and Very High Radiation Areas," Revision 1, requires the use of a swing gate or turnstile as the barricade at the entrance to a high radiation area (with dose rates less than 1000 mrem/hour) unless an access control guard is assigned to the area. The failures to adequately implement DRP 5010-1 relative to compliance with area postings that required an RP brief before area entry, and RP-AA-460 relative to the barricade at the entrance to a high radiation area, are violations of Technical Specification 5.4.1. However, because the licensee included these items in its corrective action program (CR # 2001-03847 and ATI # 70871-02), these violations are being treated as NCVs (NCV 50-237;249/01-20-01(DRS) and 50-237;249/01-20-02 (DRS)).

Cornerstone: Public Radiation Safety

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems (71122.01)

.1 Walkdowns of Liquid and Gaseous Effluent Monitoring and Control Systems

a. Inspection Scope

The inspector performed walkdowns of selected components of the liquid and gaseous effluent monitoring and control systems, including point of discharge effluent radiation monitors, liquid radwaste processing tanks and the standby gas treatment system, to verify that the current system configuration was as described in the Updated Final Safety Analysis Report and was consistent with the Offsite Dose Calculation Manual (ODCM), and to observe equipment material condition.

The inspector also walked down the Radwaste Control Room and discussed processing equipment reliability, equipment use and radwaste operating practices with control room and chemistry staffs.

b. Findings

No findings of significance were identified.

.2 Radioactive Effluent Data, Dose Calculations, and ODCM Changes

a. Inspection Scope

The inspector reviewed the 1999 and 2000 Annual Radioactive Effluent Release Reports, and selected radioactive effluent release data for 2001 through October 2001, to verify that the radioactive effluent control program was implemented as described in the ODCM and to ensure that any anomalies in the release data were adequately understood by the licensee and properly assessed. The inspector evaluated the licensee's methodology for the calculation of offsite dose and selectively reviewed results of effluent sample analyses for 2001, to verify that the licensee properly calculated dose from effluents consistent with the ODCM. The inspector also reviewed revisions made to the ODCM in calendar year 2000 and the justifications for the changes, to verify they were completed and reported in accordance with Technical Specifications and the ODCM.

b. Findings

No findings of significance were identified.

.3 Liquid and Gaseous Effluent Releases

a. Inspection Scope

As there were no liquid batch releases performed during the inspection, the inspector reviewed the release packages for a selected liquid effluent batch release completed in 2000 and for one completed in 2001, to verify that the licensee's release procedures and practices, including dose projections to members of the public and use of station specific scaling factors, were technically sound and conformed to ODCM methodology and Technical Specification requirements. The inspector also reviewed selected gaseous effluent release data including results of chemistry sample analyses, to independently verify that the data was properly used to complete calculations of offsite dose. Additionally, the inspector reviewed chemistry data for November 2001 through December 6, 2001, to verify that compensatory samples were taken and properly analyzed as required by the ODCM while the Unit 3 service water monitor was out of service.

b. Findings

No findings of significance were identified.

.4 Liquid and Gaseous Effluent Monitor Calibration

a. Inspection Scope

The inspector reviewed records of instrument calibrations performed since the last inspection for selected point of discharge effluent radiation monitors, to determine if they had been calibrated consistent with industry standards and in accordance with station procedures and the ODCM. Specifically, the inspector reviewed the calibration records for:

- Unit 2/3 Radwaste Liquid Discharge Radiation Monitor;
- Unit 2/3 General Electric Main Chimney (backup) Monitor;
- Unit 2 and Unit 3 Reactor Building Vent Exhaust Duct Radiation Monitors;
- Unit 2/3 Reactor Building Vent Stack Station Particulate Iodine and Noble Gas (SPING) Monitor; and
- Unit 2/3 Main Chimney SPING.

The inspector also reviewed current alarm setpoint values for these monitors, to assess compliance with ODCM requirements. Additionally, the inspector examined the licensee's calendar year 2000 through 2001 data for tracking the reliability and maintenance of selected point of discharge effluent radiation monitors, to assess the adequacy of the licensee's efforts to identify repetitive problems and improve the overall operating condition of the effluent radiation monitoring system.

b. Findings

The inspector identified a Green finding and an associated NCV for the failure to calibrate the radwaste liquid discharge effluent radiation monitor in accordance with ODCM requirements.

The monitor is used during discharges of liquid radwaste to the environment to monitor radioactivity in the radwaste stream as it is released from the waste surge tank. Monitor alarm setpoints are established conservatively to ensure that regulatory dose limits associated with the discharge are met, as determined by the licensee's analyses of waste tank samples. Upon monitor alarm, a grab sample of the effluent is automatically collected from the discharge side of the sample chamber. The release can then be terminated manually by closure of the discharge line valves.

The Unit 2/3 radwaste liquid discharge effluent radiation monitor was last calibrated in May 2000, using cesium-137 sources of varying activities. The radiation sources were used to determine the monitor's range and accuracy to known values of the parameter (i.e., radiation) which the instrument detects, as required by the ODCM. The cesium-137 sources used in the calibration generated detector responses up to about 150,000 counts per minute (cpm). However, during actual liquid effluent discharges completed since May 2000, the monitor was typically set to alarm at 250,000 to 500,000 cpm, depending on the isotopic mix and concentration of the discharge. Consequently, the calibration did not encompass the entire instrument response range to include its alarm setpoints, and only extended up to approximately 30 - 50 percent of the ODCM required calibration range.

This issue, if not corrected, would become a more significant concern and could impact the licensee's ability to assess the effect of plant liquid effluents on the environment, should elevated concentrations or particles of radioactivity be released that were not initially detected during waste surge tank sample analyses completed prior to the discharge. This issue also involves an occurrence in the licensee's radiological effluent monitoring program that is contrary to the ODCM. Therefore, the issue represents a finding which the inspector evaluated using the SDP for the public radiation safety cornerstone. Because proper instrument response and linearity to radiation were determined throughout most of the monitor's response range during the May 2000 calibration, and because actual samples of the discharges were adequately analyzed for radioactive content by the licensee, the licensee's ability to assess dose from radwaste liquid discharges made since May 2000 was not impaired. Consequently, the finding was determined to be of very low safety significance.

Technical Specification 6.8.D (and Improved Technical Specification 5.5.4, effective March 30, 2001) require, in part, that the radioactive effluent control program be contained in the ODCM and include limitations on the functional capability of radioactive liquid monitoring instrumentation, including surveillance tests and setpoint determinations in accordance with the methodology in the ODCM. Chapter 12 of the Dresden Station annex to the ODCM "Radiological Effluent Technical Standards," requires that the radwaste liquid effluent discharge monitor be calibrated at specified intervals and that the calibration encompass the entire instrument channel including its alarm setpoints. The failure to meet ODCM defined calibration requirements for the

radwaste liquid discharge monitor is a violation of Technical Specification 6.8.D. However, because the licensee included this item in its corrective action program (CR # 2001-85603), this violation is being treated as a Non-Cited Violation (NCV 50-237;249/01-20-03 (DRS)).

5. Air Cleaning System Surveillance Tests

a. Inspection Scope

The inspector reviewed the results from the most recent ventilation filter tests for both trains of the Standby Gas Treatment System (SGTS), to verify that test methodology, frequency and test results met Technical Specification requirements. Specifically, the inspector reviewed the results of in-place high efficiency particulate air (HEPA) and charcoal absorber penetration and bypass tests, laboratory tests of charcoal absorber methyl iodide penetration, in-place HEPA and charcoal absorber pressure drop tests and SGTS heater dissipation tests completed in 2000 and 2001.

b. Findings

No findings of significance were identified.

6. Analytical Instrumentation Quality Control and Inter-laboratory Comparison Program

a. Inspection Scope

The inspector reviewed the chemistry department's calendar year 2001 quality control data and charts for five of the gamma spectroscopy systems used to quantify effluent releases, to assess equipment performance and to verify it was tested consistent with station procedures. The inspector also reviewed the most recent calibration records for a selected geometry for each of the five spectroscopy systems, to determine if calibration acceptance criteria were met and if the calibrations were conducted in accordance with procedure, consistent with industry standards.

The inspector reviewed the results of the 2000 and 2001 inter-laboratory comparison program established to assess chemistry analytical capabilities, to determine if the program was adequately implemented in accordance with station procedure and to verify the quality of the radioactive effluent analyses performed by the licensee. The inspector reviewed the licensee's actions to address inter-laboratory comparison deficiencies, and discussed with the chemistry manager those plans to improve the program in 2002.

b. Findings

No findings of significance were identified.

.7 Identification and Resolution of Problems

a. Inspection Scope

The inspector reviewed a recent RP Department self-assessment of the effluent monitoring and ODCM program, Nuclear Oversight Department field observation reports and audits completed in 2001, and CRs generated during the 12 month period preceding the inspection that focused on ODCM implementation and the liquid and gaseous effluent monitoring and control program. The documents were reviewed to evaluate the licensee's ability to assess the effluent control program, to identify repetitive problems or trends, contributing causes and extent of condition, and to implement corrective actions to achieve lasting results.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES (OA)

4OA3 Event Follow-up (71153)

.1 Review of Licensee Event Reports (LERs)

a. Inspection Scope

The inspectors reviewed licensee event reports to ensure that issues documented in these reports were adequately addressed in the licensee's corrective action program. The inspectors also interviewed plant personnel and reviewed operating and maintenance procedures to ensure that generic issues were captured appropriately.

The inspectors reviewed operator logs, the Updated Final Safety Analysis Report, and other documents to verify the statements contained in the Licensee Event Reports.

b. Findings

(Closed) LERs 50-249/1999-003-02: Reactor Recirculation B Loop, High Pressure Flow Element Venturi Instrument Line Steam Leakage Results in Unit 3 Shutdown Due to Fatigue Failure of Socket Welded Pipe Joint. This issue was discussed in Inspection Report 50-237/1999016(DRP); 50-249/1999016(DRP). The LER revision revealed no new information. This LER revision is closed.

.2 Unit 2 Scram During Startup

a. Inspection Scope

On November 7, 2001, Unit 2 scrambled during the startup from a refueling outage. The inspectors performed an immediate review of this event. The inspectors

interviewed plant personnel, reviewed operating procedures, and reviewed the licensee's prompt investigation.

b. Findings

The inspectors identified a Green finding involving failure to follow a procedure and poor operations' management of the turbine warmup evolution which resulted in the reactor scram.

On November 6, 2001, operators commenced startup of the Unit 2 reactor following the seventeenth refueling outage. During the startup, operators performed high pressure turbine shell and chest warming in preparation for operating the turbine. Dresden Operating Procedure (DOP) 5600-05, "Main Turbine Startup," Revision 8, governed this activity. The procedure specified that turbine first stage pressure not exceed 100 pounds.

At approximately 9 percent power, the reactor experienced a sulfate excursion of greater than 600 parts per billion. As a result, power operations on the unit were limited to less than 10 percent power with reactor sulfates above twenty parts per billion. The operators continued main turbine shell warming activities while addressing the high sulfates.

At approximately 8:00 p.m. on November 7, 2001, the operators began preparing to raise reactor power to have 3 ½ bypass valves open and to roll the turbine when a half scram was received on the unit. The operators stopped work activities to investigate the cause of the half scram.

During this investigation, the operators noted that the turbine stop valve closure scram relay for the "A" reactor protection system bus had dropped out. Approximately one minute later the operators heard a second relay drop out and the reactor scrambled. The second relay was the turbine stop valve closure scram relay for the "B" reactor protection system bus. Plant equipment responded as expected following the scram.

The licensee determined that the reactor scrambled on turbine first stage pressure exceeding the 45 percent stop valve closure scram bypass logic. The reactor protection system scrambled the reactor as designed with the bypass logic made up and the stop valve closed.

During the review of the event, the inspectors noted that operators had repeatedly exceeded the first stage pressure procedural limit of 100 psig. Additionally, during interviews with the on shift operators after the scram occurred, the inspectors noted that none of the operators were aware that the first stage pressure was approaching the 45 percent power pressure setpoint. The inspectors concluded that this was an indication of poor panel monitoring since the pressure rise seen prior to the scram was relatively slow according to a computer plot. The inspectors noted that the operator assigned to perform the turbine warmup activity was taken off shift to perform just-in-time training on the feed water level control system. Also, a job specific turnover was not performed between the off-going and oncoming operator to status the turbine warmup activity.

During past high pressure turbine shell and chest warmup activities a number of turbine related valves leaked excessively during shell warming. Thus, the operators never paid particularly close attention to turbine first stage pressure during shell warming because the turbine would trip before ever reaching the 100 psig procedural limit. However, during the outage the licensee replaced the high pressure turbine and replaced or repaired the leaking valves resulting in a more leak tight system. Therefore, the operators should have not expected to see the turbine trip prior to reaching 100 psig.

Also, during the outage, the licensee set the turbine stop valve closure scram circuitry bypass pressure switches from 292 pounds to 209 pounds due to the extended power uprate modification. This significantly reduced the margin between the procedural limit and the 45 percent scram bypass logic.

The inspectors determined that: (1) operations staff's failure to recognize and manage the system's new operating characteristics; (2) the significantly reduced margin between the procedural limits and the new scram logic bypass setpoint change; and (3) poor control room board monitoring were all contributors in this initiating event (FIN 05-249/01-20-04). However, because all mitigating systems were available at the time of the scram, this finding was considered to be of very low safety significance (Green). This issue was entered into the licensee's corrective action program as CR D2001-082094.

4OA6 Exit Meetings

The reactor engineer presented the results of the inservice inspection to Mr. K. Bowman and other members of licensee management and staff on November 16, 2001.

The senior radiation specialist inspector presented the results of the occupational and public radiation safety inspection to Mr. Dale Ambler and other members of licensee management and staff on December 7, 2001.

The resident inspectors presented their inspection results to Mr. Swafford and other members of licensee management at the conclusion of the inspection on December 27, 2001. The licensee acknowledged the findings presented. No proprietary information was identified.

KEY POINTS OF CONTACT

Licensee

R. Bauman, ISI Coordinator
K. Bowman, Operations Manager
H. Bush, Radiation Protection Supervisor
V. Castle, Training Operations Manager
J. Ellis, Performance Monitoring Group Lead
R. Fisher, Plant Manager
T. Fisk, Chemistry Manager
M. Friedman, Emergency Preparedness Coordinator
V. Gengler, Security Manager
R. Geier, RV/ISI NDE Coordinator
K. Hall, NDE Level III
S. Hunsader, Corporate Maintenance Rule Owner
T. Luke, Director, Engineering
R. May, NDE Level III
J. Moser, Radiation Protection Manager
J. Nalewajka, Acting Nuclear Oversight Manager
B. Norris, Radiation Protection Engineering Supervisor
L. Oshier, Radiation Protection Technical Support Supervisor
R. Peak, Design Engineering Manager
R. Ruffin, Regulatory Assurance - NRC Coordinator
R. Rybak, Regulatory Assurance
N. Spooner, Site Maintenance Rule Coordinator
W. Stoffels, Maintenance Manager
P. Swafford, Site Vice President
R. Whalen, System Engineering Manager

NRC

G. Grant, Director, Division of Reactor Projects
M. Ring, Chief, Division of Reactor Projects, Branch 1
D. Smith, Dresden Senior Resident Inspector
B. Dickson, Dresden Resident Inspector

IDNS

R. Zuffa, Illinois Department of Nuclear Safety

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-237;249/01-20-01	NCV	Failure to be briefed by radiation protection prior to entry into a posted high radiation area
50-237;249/01-20-02	NCV	Failure to properly set-up a high radiation area barricade
50-237;249/01-20-03	NCV	Failure to calibrate the radwaste liquid effluent radiation monitor to encompass the entire instrument response range including alarm function
50-249/01-20-04	FIN	Failure of the operators to maintain the first stage pressure within procedural limits and inadequate operations staff's management and oversight of the turbine shell warming evolution resulted in an initiating event

Closed

50-237;249/01-20-01	NCV	Failure to be briefed by radiation protection prior to entry into a posted high radiation area
50-237;249/01-20-02	NCV	Failure to properly set-up a high radiation area barricade
50-237;249/01-20-03	NCV	Failure to calibrate the radwaste liquid effluent radiation monitor to encompass the entire instrument response range including alarm function
50-249/01-20-04	FIN	Failure of the operators to maintain the first stage pressure within procedural limits and inadequate operations staff's management and oversight of the turbine shell warming evolution resulted in an initiating event
50-249/1999-003-02	LER	Supplement to reactor recirculation B loop high pressure flow element venturi instrument line steam leakage results in unit 3 shutdown due to fatigue failure of socket welded pipe.

LIST OF ACRONYMS USED

CR	Condition Report
CFR	Code of Federal Regulations
DIS	Dresden Instrument Surveillance
DOS	Dresden Operating Surveillance
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
FIN	Finding
HEPA	High Efficiency Particulate Air
IDNS	Illinois Department of Nuclear Safety
LER	Licensee Event Report
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
OA	Other Activities
ODCM	Offsite Dose Calculation Manual
PSB	Plant Support Branch
Radwaste	Radioactive Waste
RP	Radiation Protection
SDP	Significance Determination Process
SGTS	Standby Gas Treatment System
SPING	Station Particulate Iodine and Noble Gas
SSC	Structures, Systems, and Components
VDC	Volts Direct Current
WO	Work Order

LIST OF DOCUMENTS REVIEWED

1R01 Adverse Weather

DOS 0010-22	Preparation for Cold Weather for Unit 2	Revision 10
DOS 0010-25	Preparation for Cold Weather for Unit 3	Revision 10
DOS 0010-28	Preparation for Cold Weather for Radiation Waste	Revision 10
DOS 0010-23	Initiation of Cold Weather Operations for Unit 2	Revision 04
DOS 0010-26	Initiation of Cold Weather Operations for Unit 3	Revision 02
DOS 0010-29	Initiation of Cold Weather Operations for Radiation Waste	Revision 02

1R05 Fire Protection

CR 00084998	Excessive Scaffolding and Carts Block Fire Protection Equipment	December 4, 2001
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1R12 Maintenance Rule Implementation

CR 00084284	250 Battery Charger Failed High Voltage Alarm Test	November 29, 2001
CR 00084817	Standby Liquid Gas Treatment Limiting Condition for Operations Last 3.5 days vice 4 Shifts	November 29, 2001
ER-AA-310	Maintenance Rule	Revision 0
NEG-G-15.03	Maintenance Rule: Performance Criteria Determination Standard	Revision 0
NEG-G-15.04	Maintenance Rule: System Monitoring Standard	Revision 0
NEG-G-15.05	Maintenance Rule: Goal Setting Standard	Revision 0
NEG-G-15.06	Maintenance Rule: Periodic Assessment Standard	Revision 0
	Maintenance Rule Periodic Assessment (July 1, 1997 through February 28, 1999)	May 1999
	Maintenance Rule Periodic Assessment (March 1, 1999 through September 30, 2000)	January 4, 2001

	System Health Indicator Program (HPCI, IA, 250 VDC)	September 2001
	List of Maintenance Rule System Functions and Safety Significance	October 26, 2001
	List of Goals and Corrective Actions for (a)(1) Systems (from Maintenance Rule Data Base)	
	Expert Panel Meeting Minutes (March 24, 1999, through August 10, 2000)	
	DC H-I-T Team Findings and Recommendations	April 30, 1999
	High Pressure Coolant Injection System Point to Point Review Report	May 25, 1999
	Maintenance Rule (a)(1) Action Plan for the 250VDC Distribution System	December 23, 1998
	Reactor Recirculation Maintenance Rule (a)(1) Action Plan	July 23, 2001
	250 VDC Maintenance Rule (a)(1) Monitoring Position Period Position Paper	August 31, 1999
	Self-Assessment: Maintenance Rule Implementation	September 3, 1999
	Self-Assessment: Maintenance Rule Implementation	May 4, 2000
	Self-Assessment: Maintenance Rule Implementation	November 8, 2001
CR D1999-01309	2A Instrument Air Compressor Dryer Failed Post Maintenance Test	March 15, 1999
CR D1999-01502	Rework Required on High Pressure Coolant Injection Motor Speed Changer & Motor Gear Unit Motors	March 27, 1999
CR D1999-01790	2/3 250VDC Battery Charger Degraded Volts/Amps	April 21, 1999
CR D1999-02938	Unit 3 Feedwater Regulating Valve N ₂ Backup Failure	July 27, 1999
CR D1999-04114	High Pressure Coolant Injection Valve 2-2301-45 Failed As-Found Local Leak Rate Test	October 7, 1999

CR D1999-04340	2B Instrument Air Compressor Tripped on Motor Overload	October 16, 1999
CR D1999-04538	Failure of Unit 2 250VDC Battery Charger Following Service Test	October 14, 1999
CR D2000-00261	Foreign Material Exclusion in 3C Instrument Air Compressor Low Oil Pressure Switch	January 17, 2000
CR D2000-00360	Unit 2 High Pressure Coolant Injection Stop Valve Packing Leak	January 21, 2000
CR D2000-03170	3C Instrument Air Compressor Trips While in Service	June 3, 2000
CR D2000-03506	Unit 2 High Pressure Coolant Injection Inoperable Due to Failure of Check Valve 2-3999-252	June 22, 2000
CR D2000-04788	2B Instrument Air Compressor Tripped and Failed Post Maintenance Test	September 1, 2000
CR D2000-05626	Unit 3 250 VDC Battery Charger Trouble and Battery Under Voltage	October 8, 2000
CR 00011409	Maintenance Rule Periodic Assessment Recommendations	October 29, 1999
CR 00011458	Feedwater Level Control Performance Criteria Review	May 21, 1999
CR 00011479	Main Steam Maintenance Rule Performance Criteria Review	May 21, 1999
CR 00040755	2000 Maintenance Rule Periodic Assessment Recommendations	December 20, 2000
CR 00082061	Missed Maintenance Rule Quarterly Evaluations	November 6, 2001

1R13 Maintenance Work Prioritization & Control

WO# 371671	Unit 2 Emergency Diesel Generator	
WO# 353297	Unit 3 High Pressure Coolant Injection Run	
DOS 6600-01	Diesel Generator Surveillance Test	Revision 72
DOS 2300-03	High Pressure Coolant Injection System Operability Verification	Revision 69

1R14 Non-Routine Evolutions

DGA-07	Unpredicted Reactivity Addition	Revision 14
DOS 1200-01	Reactor Water Cleanup System Valve Operability and Timing	Revision 05
DOP 1200-03	Reactor Water Cleanup System Operation with the Reactor at Pressure	Revision 37
P&ID	Reactor Water Cleanup Piping	M-30 Sheet 1

1R19 Post Maintenance Testing

WO# 00381604 01	Repair to an operated valve 2/3 - 7510-B, 'B' Standby Gas Treatment Train Fan Suction Valve	
DOS 7500-02	Standby Area Treatment System Surveillance and Inservice Test	Revision. 25
DCP 99000371-01	2/3"B" Standby Gas Treatment System test of time delay relay	

1R22 Surveillances

DIS 1500-35	Low Pressure Coolant Injection Reactor Recirculating Pump A and B Differential Pressure Indicating Switch Channel Functional Test	Revision 00
CR 00086333	3-2301-45 Valve Failed Local Leak Rate Test	December 12, 2001
CR 00087944	Main Steam Isolation Valve 3-203-2D Fails Acceptance Criteria of DOS 0500-08	December 23, 2001
CR 00088280	3-263-52B Found Out of Tolerance - Technical Specification Violation	December 28, 2001
CR 00088608	Relay Contact Failure Identified under DIS 020-01	January 2, 2002
SP I 01-03-003	Dresden Unit 2 Extended Power Uprate Power Ascension Test Special Procedure	Revision 02A
SP I 01-07-005	Dresden Unit 2 Pressure Control System Test Special Test Procedure	Revision 02

SP 01-08-001	Dresden Unit 2 Feedwater Level Control System Incremental Regulation Test Special Procedure	Revision 02
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71153 Event Follow Up

CR 00085955	Intermediate Range Monitor 11 Caused Half SCRAM during U3 Shutdown on 12/11/01	December 11, 2001
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CR 2001-82094	Unit 2 Unexpected Automatic Scram	November 7, 2001
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CR 00086149	Reactor Vessel Head Flange Leakage Results in Unit Shutdown	November 12, 2001
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2OS1 Access Control to Radiologically Significant Areas

Condition Reports and Related

CR 2001-03847	High Radiation Area Technical Specification Violation	July 23, 2001
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ATI 70871-02	Document Results of Fact Finding Performed and Actions Taken as a Result of This Event	
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Procedures

DRP 5010-1	Radiological Posting and Labeling Requirements	Revision 09
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RP-AA-460	Controls for High and Very High Radiation Areas	Revision 1
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Other Documents

Exelon Response to NRC Request for Evaluation		October 9, 2001
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2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

Condition Reports

CR 2000-05513	Unit 2/3 Chimney Noble Gas Monitor Failure	October 1, 2000
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CR 2000-5900	Unit 2 Service Water Monitor Low Flow	October 23, 2000
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CR 2000-5924	Unit 2 Chimney Noble Gas Monitor Failure	October 27, 2000
CR 2001-2462	Unit 2/3 Chimney GE Monitor Spiking	May 6, 2001
CR 2001-2705	Unit 2/3 Vent SPING Noble Gas Monitor Inop	May 18, 2001
CR 2001-3090	Unit 2 Service Water Rad Monitor Failed Upscale	June 9, 2001
CR 2001-3508	Unit 2 Service Water Monitor Failed Low Flow	July 2, 2001
CR 2001-3666	River Discharge Monitor Failure During Batch Release	July 21, 2001
CR 2001-4157	Unit 2/3 Reactor Building Vent SPING Samples Missed	August 10, 2001
CR 2001-1990	Unit 2/3 Chimney SPING Alarming	April 13, 2001
CR 2000-6405	Unit 2/3 Main Chimney SPING Channel 6 Low Fail	December 14, 2000
CR 2001-2665	Unit 2/3 Reactor Building Vent SPING	May 17, 2001
CR 2001-02705	Unit 2/3 Reactor Building Vent SPING Noble Gas Monitor	May 18, 2001
CR 2001-3090	Unit 2 Service Water Monitor Failed	June 9, 2001
CR 2001-81583	Abnormal Release Due to Condenser Tube Leakage	November 13, 2001
CR 2001-82408	Effluent Samples Not Counted Within Required Time	November 9, 2001

Procedures and Surveillance Records

SGTS "A" Train Ventilation Filter Tests	March 2001
SGTS "B" Train Ventilation Filter Tests	May 1999 and December 2000
Gamma Spectroscopy System, Detector #33-P308, Calibration	February 16, 2000
Gamma Spectroscopy System, Detector #36-P407 Calibration	February 23, 2000

	Gamma Spectroscopy System, Detector #8973769, Calibration	October 19, 1998
	Gamma Spectroscopy System, Detector #2997068, Calibration	January 18, 2000
	Gamma Spectroscopy System, Detector #8973824, Calibration	June 30, 2000
DRP 6110-18	Noble Gas Effluent Release	Revision 02
DRP 6110-21	Liquid Radwaste Scaling Factors	Revision 01
DRP 5821-27	Unit 2/3 Plant Chimney Radiation Monitor Calibration	Revision 02
DOP 2000-110	Waste Surge Tank Radwaste Discharge to River With the Off Stream Liquid Effluent Monitor Operable	Revision 21
CY-AA-130-200	Quality Control	Revision 3
DRS 5830-01, Revision 3	Unit 2/3 Liquid Discharge Monitor Calibration	May 2000
DRP 5821-27, Revision 02	Unit 2/3 GE Chimney Monitor Calibration	November 2001
DIS 1700-21, Revision 9	Unit 2 and Unit 3 Reactor Building Vent Radiation Monitor calibration	November 2001 and October 2001
DRS 5821-56, Revision 02	Unit 2/3 Reactor Building Vent SPING Calibration	July 2000
DIS 1700-14, Revision 15	Unit 2/3 Reactor Building Stack SPING-4 Calibration	July 2000
DRS 5821-56, Revision 02	SPING Effluent Monitor Calibration (Main Chimney)	August 2000

Self-Assessments, Audits and Field Observations

Report # 84435	Effluent Monitoring and Offsite Dose Calculation Program	November 29, 2001
NOA-DR-01-1Q	Nuclear Oversight Continuous Assessment Report	January - March 2001
NOA-DR-01-2Q	Nuclear Oversight Continuous Assessment Report	April - June 2001

NOA-DR-01-3Q	Nuclear Oversight Continuous Assessment Agenda Plan	June 22, 2001
NOA-DR-01-2Q	NOS Field Observation - Radioactive Effluent Monitoring	June 7, 2001
NOA-DR-01-1Q	NOS Field Observation - Material Condition and Calibration of Analytical Equipment	March 14, 2001
NOA-DR-01-1Q	NOS Field Observation - Technical Specification Sampling	February 15, 2001
NOA-DR-01-1Q	NOS Field Observation - Material Condition and Calibration of Analytical Equipment	March 14, 2001
NOA-DR-01-1Q	NOS Field Observation - Technical Specification Sampling and License Compliance	February 21, 2001
NOA-DR-01-1Q	NOS Field Observation - Technical Specification and License Compliance	March 14, 2001

Reports

PSLTR # 00-0067	Dresden Nuclear Power Station 1999 Radioactive Effluent release Report
PSLTR #01-0042	Dresden Nuclear Power Station 2000 Radioactive Effluent Release Report and Offsite Dose Calculation Manual Changes

Other Documents

Results of Inter-laboratory Comparisons	1 st , 2 nd , 3 rd and 4 th Quarters of 2000, and 1 st and 4 th Quarters of 2001
Dresden Station Annexes to ODCM , Chapters 10, 12 and Appendix F	Revisions 1.11 and 1.12