October 21, 2005

Mr. Christopher M. Crane
President and Chief Nuclear Officer
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: NRC INSPECTION REPORT 050-00295/05-002(DNMS) - ZION NUCLEAR STATION

Dear Mr. Crane:

On September 29, 2005, the NRC completed an inspection at the Zion Nuclear Station. The purpose of the inspection was to determine whether decommissioning activities were conducted safely and in accordance with NRC requirements. Specifically, the inspector evaluated organization and management controls, safety reviews, self assessments, spent fuel safety, maintenance and surveillance, and radiological waste. At the conclusion of the inspection, the NRC inspector discussed the findings with members of your staff.

The inspection consisted of an examination of activities at the facility as they relate to safety and compliance with the Commission's rules and regulations. Areas examined during the inspection are identified in the enclosed report. Within these areas, the inspection consisted of a selective examination of procedures and representative records, field observations of activities in progress, and interviews with personnel.

Based on the results of this inspection, the NRC did not identify any violations.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). The NRC's document system is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

We will gladly discuss any questions you may have regarding this inspection.

Sincerely,

/RA/

Jamnes L. Cameron, Chief
Decommissioning Branch

Docket No. 05000295
License No. DPR-39

Enclosure: Inspection Report 050-00295/05-002(DNMS)

cc w/encl: Zion Nuclear Power Station Decommissioning Plant Manager
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Senior Vice President - Nuclear Services
Vice President of Operations - Mid-West Pressurized Water Reactor
Vice President - Licensing and Regulatory Affairs
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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No.	050-00295
License No.	DPR-39
Report No.	050-00295/05-002(DNMS)
Licensee:	Exelon Generation Company, LLC
Facility:	Zion Nuclear Station
Location:	101 Shiloh Boulevard Zion, IL 60099
Date:	September 27 through 29, 2005
Inspector:	Peter J. Lee, Ph.D., CHP, Health Physicist
Approved by:	Jamnes L. Cameron, Chief Decommissioning Branch Division of Nuclear Materials Safety

EXECUTIVE SUMMARY

Zion Nuclear Station
NRC Inspection Report 050-00295/05-002(DNMS)

This routine decommissioning inspection focused on the evaluation of the licensee's spent fuel safety and radiological safety.

Spent Fuel Safety

- The inspector determined that the licensee properly maintained the spent fuel pool water level, temperature, chemistry, cleanliness control, and criticality control to ensure the safe wet storage of the spent fuel. The inspector also determined that the monthly test of high radiation in the spent fuel pool area and annually for the rest of the functional tests will be adequate to ensure that the abnormal conditions would be made known to the operators in a timely fashion. (Section 1.1)

Radiological Safety

- The inspector concluded that the licensee effectively monitored and controlled personnel exposures to radiation. The inspector also determined that the licensee effectively implemented its survey instrument calibration program to ensure adequate response of the instruments to radiation. (Section 2.1)

- The inspector determined that the licensee properly prepared shipments of radioactive materials and complied with NRC and DOT regulatory requirements. (Section 2.2)

- The inspector concluded that the licensee's quality control program for its onsite laboratory was effectively implemented and that instrumentation used for the analyses was properly calibrated to ensure the quality of the analytical data. The inspector also determined that the licensee adequately controlled effluent releases. (Section 2.3)

Report Details

Summary of Plant Activities

During the period covered by this inspection, the licensee maintained the spent fuel in storage within the spent fuel pool.

1.0 Spent Fuel Safety

1.1 Spent Fuel Pool Safety (IP 60801)

a. Inspection Scope

The inspector verified the safe wet storage of spent fuel in the fuel building. The review included spent fuel pool (SFP) instrumentation, alarms, cleanliness control, chemistry of the SFP, and criticality controls, and the results of the June through September 2005 spent fuel pool water temperatures, levels, and chemistry and gamma spectrum analyses.

b. Observations and Findings

The reviewed analyses results indicated that all parameters were within procedural limits. The licensee maintained the boron concentration in the spent fuel pool at approximately 2000 parts per million (ppm) versus the Technical Specifications limit of greater than 500 ppm.

The licensee modified the plant pager system to alert operating personnel when abnormal spent fuel pool conditions are present. The pager system relieved the operators from continuously manning the control room. A designated pager, worn by operating personnel, was designed to alarm for spent fuel pool high and low water level, high water temperature, fuel building high radiation, cooling tower pump trip, and abnormal fuel building ventilation system operation, among other key parameters. Currently the licensee established 20 functional tests to verify proper pager function in response to anticipated control room alarms affecting spent fuel pool safety. Eighteen out of twenty functional tests have been completed. The licensee committed to perform those tests at least annually. The licensee proposed to perform the monthly functional test for high radiation in the spent fuel pool area, and annually for the rest of the functional tests. The alarm set point for the area radiation monitor will be set at the radiation level responding to the predetermined water level drop in the spent fuel pool.

c. Conclusions

The inspector determined that the licensee properly maintained the spent fuel pool water level, temperature, chemistry, cleanliness control, and criticality control to ensure the safe wet storage of the spent fuel. The inspector also determined that the monthly test of high radiation in the spent fuel pool area and annually for the rest of the functional tests will be adequate to ensure that the abnormal conditions would be made known to the operators in a timely fashion.

2.0 Radiological Safety

2.1 Occupational Radiation Exposure

a. Inspection Scope (83750)

The inspector reviewed the external dosimetry records for the first half of 2005. The inspector reviewed the general air sampling results, direct radiation survey, and smear sample results from the Fuel Building and the Auxiliary Building for the first and second quarter of 2005. The inspector reviewed the calibration procedures and records of the radiation survey meters and then verified the calibration by having the licensee's health physics technician expose the survey meters to the predetermined exposure rates in the calibration range.

b. Observations and Findings

The highest external radiation exposure received by workers during the first half of calendar year 2005 was 20 millirem. The results of general area air sampling during the first and second quarters of 2005 in the fuel and auxiliary buildings did not indicate any results above ambient background levels. The results of the routine quarterly surveys in the Fuel Building and the Auxiliary Building had not identified any significant removal contamination.

During the inspection, licensee health physics technicians exposed inspector-selected Eberline RO-2 and RO-2A and Teletector 6112B survey meters to predetermined exposure rates in the instrument calibration range. The instrument readings were within 10 percent of the predetermined exposure rates.

c. Conclusions

The inspector concluded that the licensee effectively monitored and controlled personnel exposures to radiation. The inspector also determined that the licensee effectively implemented its survey instrument calibration program to ensure adequate response of the instruments to radiation.

2.2 Transportation of Radioactive Materials (86750)

a. Inspection Scope

The inspector reviewed the radioactive materials shipping program and applicable shipping documents. The inspector evaluated whether the licensee was in compliance with NRC and Department of Transportation (DOT) shipping requirements.

b. Observations and Findings

The licensee processed nine radiological waste shipments in July 2005. The waste contained valves from the turbine. The wastes were shipped as excepted packages of limited quantity. The licensee shipped the valves to an authorized recipient. The licensee prepared the shipments in accordance with DOT and licensee procedural requirements.

c. Conclusions

The inspector determined that the licensee properly prepared shipments of radioactive materials and complied with NRC and DOT regulatory requirements.

2.3 Radioactive Waste Treatment, Effluent, and Environmental Monitoring

a. Inspection Scope (84750)

The inspector reviewed aspects of the licensee's program for on-site laboratory analyses, interviewed laboratory personnel, and reviewed analytical data of effluent release during the third quarter of 2005. The review included an evaluation of the analytical procedures for particulates, gases, and liquids. The inspector also conducted an independent quality assurance check of the analytical data.

b. Observations and Findings

The laboratory was equipped with germanium detectors for particulate, gas and liquid sample analyses, a liquid scintillation counter for tritium analyses, and gas proportional counters for gross alpha and beta analyses. The results of effluent sampling during the third quarter of 2005 did not identify the presence of any radioactive materials in quantities statistically different from background concentrations.

As an independent quality assurance check of the analytical data, the licensee's laboratory technicians treated the calibration standards for particulate, gas, and liquids as collected samples. The results of the analyses of the samples were all in agreement with the certificates of the standards.

c. Conclusions

The inspector concluded that the licensee's quality control program for its onsite laboratory was effectively implemented and that instrumentation used for the analyses was properly calibrated to ensure the quality of the analytical data. The inspector also determined that the licensee adequately controlled effluent releases.

3.0 Exit Meeting

The inspector presented the inspection results to licensee management at the conclusion of the inspection on September 29, 2005. The licensee acknowledged the findings presented did not identify any of the documents or processes reviewed by the inspector as proprietary.

PARTIAL LIST OF PERSONS CONTACTED

* R. Schuster, Plant Manager
* J. Ashley, Design Engineering
* R Adams, Operations and Engineering Manager
* L. Cunningham, Security Project Manager
* M. Petersen, Administration/Training Supervisor

* Present at the September 29, 2005 exit meeting.

INSPECTION PROCEDURES (IP) USED

IP 83750	Occupational Radiation Exposure
IP 60801	Spent Fuel Pool Safety
IP 86750	Transportation of Radioactive Materials
IP 84750	Radioactive Waste Treatment, and Effluent and Environmental Monitoring

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened	None
Closed	None
Discussed	None

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
DNMS	Division of Nuclear Materials Safety
DOT	Department of Transportation
IP	Inspection Procedures
NRC	Nuclear Regulatory Commission
ppm	parts per million
SFP	Spent Fuel Pool

LICENSEE DOCUMENTS REVIEWED

Licensee documents reviewed and utilized during the course of this inspection are specifically identified in the “Report Details” above.