U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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| Docket Nos: | 50-373; 50-374 |
| License Nos: | NPF-11; NPF-18 |
| Report Nos: | 50-373/98006(DRS); 50-374/98006(DRS) |
| Licensee: | Commonwealth Edison Company |
| Facility: | LaSalle County Nuclear Power Station<br>Units 1 and 2 |
| Location: | 2601 North 21st Road<br>Marseilles, IL 61341 |
| Dates: | February 23-27, 1998 |
| Inspectors: | W. Slawinski, Senior Radiation Specialist<br>R. Glinski, Radiation Specialist |
| Approved By: | G. L. Shear, Chief, Plant Support Branch 2<br>Division of Reactor Safety |

## EXECUTIVE SUMMARY

LaSalle County Nuclear Power Station, Units 1 and 2
NRC Inspection Reports 50-373/98006; 50-374/98006

This inspection consisted of a review of the chemistry and radiological environmental monitoring programs, and selected radiation protection program activities including the radiological planning and controls for the ongoing spent fuel pool inventory reduction project. A recent incident involving the identification of radioactive material outside the radiologically posted area (RPA) was also reviewed. The inspection resulted in the following conclusions:

- The radiological environmental monitoring sampling and analysis program was well implemented, and the 1997 data showed that plant operations did not have a discernible radiological impact on the environment (Section R1.1).

- Reactor water quality improved during the latter portion of the last operating cycle, primarily due to improved management of the condensate polishers. The installation and planned operation of the hydrogen injection system was well managed (Section R1.2).

- The radiological controls developed for the spent fuel pool inventory reduction project were good, with appropriate consideration given to identifying potential hot particles. While the as-low-as-reasonably-achievable (ALARA) plan for the project was generally sound and developed in accordance with procedure, the plan did not adequately incorporate lessons learned from previous industry experience and therefore management expectations were not met (Section R1.3).

- The licensee's response to a self-identified incident involving radioactive material found outside the RPA was prompt and aggressive, and included a comprehensive root cause evaluation. Immediate and short term corrective actions were appropriate. Self-identified weaknesses with the radioactive material control program and proposed long term corrective actions were being evaluated by station management (Section R1.4).

- The makeup water system was well maintained, and the system effectively met plant needs for ultra pure water. The reliability and materiel condition of the system components were excellent, as evidenced by water quality data and system operating history (Section R2.1).

- Chemistry personnel were knowledgeable of their various responsibilities, demonstrated good ALARA practices and ownership of chemistry department activities, and conducted work in accordance with station procedures (Section R4.1).

- The quality assurance/quality control (QA/QC) and materiel condition of chemistry laboratory instrumentation were excellent, as evidenced by QC checks and QA intercomparison data. In addition, the materiel condition of the instruments was good and control of standards and reagents was effective (Section R7.1).

- Chemistry QC data indicated operability problems with a number of in-line instruments; however, the chemistry staff effectively initiated a program to upgrade these monitors. In addition, the chemistry department's oversight of the installation and management of the in-line instruments associated with the hydrogen water chemistry addition program was effective (Section R7.2).

- A comprehensive chemistry self assessment program was developed and recently implemented by the chemistry staff. The inaugural assessment was relatively broad in its scope and identified problems with the reliability of certain effluent radiation monitors, and the need for improvement in chemistry staff knowledge and skill levels, and timeliness of preparing certain samples for off-site analyses. Corrective actions were tracked to ensure appropriate resolution (Section R7.3).

Report Details

## IV. Plant Support

### R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 Implementation of the Radiological Environmental Monitoring Program (REMP)

a. Inspection Scope (IP 84750)

The inspectors reviewed 1997 REMP data, and observed air particulate and surface water sampling. The inspectors also interviewed plant staff regarding the materiel condition of the sampling equipment and implementation of the REMP.

b. Observations and Findings

The inspectors observed that the REMP sample collector's air and water collection techniques ensured sample integrity, and that the samples were appropriately labeled and packaged. The sample collection contractor tested the air sampling train for air leaks and determined that one sample station (L-3) was leaking. This individual successfully identified that the gasket of the iodine cartridge holder was the source of the leak and corrected the problem immediately. The water sample container was appropriately rinsed with the sample media prior to sample collection, as required by the sample procedure. The inspectors determined that the REMP contract collector was sufficiently knowledgeable of sampling requirements, equipment, and transport.

The inspectors noted that the contractor's 1997 REMP report catalogued several failures of timers and pumps. In addition, the collector indicated recent problems with the vacuum pump flowmeters. Plant staff contacted the contractor office, which indicated that the timer problems were primarily due to lack of power to the sampling equipment. The contract staff properly serviced the sampling equipment and calibrated the flowmeters monthly with a secondary calibration standard.

The REMP program included the collection and analysis of air, water, vegetation, fish, and river sediment. In addition, thermoluminescent dosimeters (TLD) used to measure direct radiation were exchanged quarterly, as required. The REMP sampling and analyses were properly completed, and missed or anomalous samples were listed. The 1997 REMP data indicated that plant operations did not have a discernable radiological impact on the environment.

c. Conclusions

The REMP sampling and analysis were well implemented, and the 1997 data showed that plant operations did not have a discernible radiological impact on the environment.

R1.2 Control of Plant Water Quality

a. Inspection Scope (IP 84750)

The inspectors reviewed historical reactor water quality data generated over the last several years through the current extended shutdown in 1996, and interviewed plant personnel regarding past and future actions to improve plant water quality.

b. Observations and Findings

Reactor water quality data for both units showed that although the 1991-1993 sulfate concentrations were generally above the Electric Power Research Institute (EPRI) Action Level 1 guideline of 5 parts per billion (ppb) during power operations, the sulfate levels were generally maintained under the industry average of 3 ppb from 1994 through 1996. The inspectors noted that plant staff maintained the reactor water chloride levels well below the EPRI Action Level 1 guideline of 5 ppb. Reactor water quality was improved over the last several years through more effective utilization of the condensate polisher beds. The feedwater (FW) iron levels were generally maintained below the EPRI Action Level 1 guidelines, with occasional spikes slightly above the 5 ppb action level. Condenser tube leaks continued to challenge water quality; however, plant management planned to replace current tubes in Unit 1 with stainless steel tubes during the next refueling outage.

The staff planned to initiate hydrogen water chemistry (HWC) soon after reactor startup at an injection rate that was calculated by industry-accepted software. Interviews with plant chemistry staff regarding the hydrogen storage and injection initiatives and walkdowns of the injection equipment did not identify any problems. The plant initiated zinc injection in 1994 and the operability of the injection system remained excellent.

c. Conclusions

Reactor water quality improved during the latter portion of the last operating cycle, primarily due to improved management of the condensate polishers. The planned replacement of condenser tubes should further improve water quality. The installation and planned operation of the hydrogen injection system was well managed.

R1.3 Fuel Pool Inventory Reduction Project

a. Inspection Scope (IP 83750)

The inspectors reviewed the ALARA planning, the radiological controls and a 10 CFR 50.59 safety evaluation for the ongoing spent fuel pool inventory reduction project. The inspectors interviewed workers; reviewed the ALARA plan, associated radiation work permit (RWP) and applicable procedures; and observed the underwater loading of irradiated components into a cask.

b. Observations and Findings

The work scope consisted of removal and loading of previously cut, irradiated control rod blades and related components, local power range monitors, and other irradiated hardware from the fuel pool and cask well areas. After loading activities were completed, shipments to a low level waste burial site were conducted. Five shipments of highly radioactive components were planned to be underwater loaded into a shipping cask, and two shipments of lower dose components were to be loaded in air into a high integrity container and cask staged on the refuel floor.

The original exposure estimate for the project was 8.25 rem, based on cask vendor supplied estimates of the time necessary to complete required tasks, and conservative work area dose rate information generated by the licensee. However, significantly less dose was expended during the first two shipments than was originally projected, due primarily to the overly conservative dose rate data. The licensee anticipated revising the total exposure estimated for the project to about 3 rem, based on the observed, more realistic area dose rate information.

The ALARA planning process and development of the ALARA plan and RWP were generally sound and in accordance with station procedure. The ALARA plan and RWP incorporated appropriate radiological provisions including consideration for identifying hot particles. However, the inspectors identified that the ALARA plan did not adequately incorporate lessons learned from previous industry experiences, and consequently did not meet radiation protection (RP) management expectations for completeness. Minor ALARA plan documentation problems were also identified by the inspectors, and RP management indicated that these matters would be addressed.

The inspectors reviewed a safety evaluation for the project conducted to demonstrate compliance with the requirements of 10 CFR 50.59. The inspectors concluded that the licensee's evaluation was technically sound and sufficient to support the conclusion that the project would not create new failure modes, that the margin of safety was not reduced, and the consequences of a postulated accident were bounded by current analyses in the final safety analysis report. The inspectors' review determined that procedures and mechanisms were in place to ensure that cask movement within the reactor building was confined to a pre-defined and safety analyzed "L-path" corridor.

The inspectors noted that RP controls were appropriately listed on the RWP and ALARA plan, and communicated to involved staff. In particular, staff were aware of the importance of conducting continual radiation surveys and maintaining proper radiological controls during movement of irradiated components. During the underwater cask loading, the inspectors noted good job coverage and contractor oversight by the RPTs and the fuel handling supervisor. For example, RPTs used extendable radiation detection instruments to survey items being loaded into the cask, and underwater video equipment was used to ensure proper alignment of the cask head.

c. Conclusions

The radiological controls developed for the project were effective, with appropriate consideration given to identifying hot particles. While the ALARA plan was generally sound and developed in accordance with station procedure, the plan did not adequately incorporate lessons learned from previous industry experience and satisfy management expectations for completeness. The ALARA plan and associated radiological controls for the underwater loading of irradiated hardware into a shipping cask were effectively implemented.

R1.4 Radioactive Material Found Outside the Radiologically Posted Area (RPA)

a. Inspection Scope (IP 83750)

The inspectors reviewed the circumstances surrounding a licensee identified incident involving a contaminated bag found outside the RPA. The review included discussions with RP personnel involved in the evaluation of the incident; and review of a preliminary root cause investigation report, an associated problem identification form (PIF) and the procedures governing the release of radioactive material outside the RPA.

b. Observations and Findings

On February 15, 1998, a station security guard discovered a small yellow and magenta colored nylon vacuum hose bag lying on the stoop just outside the main access facility (MAF). The bag was found several feet upstream of the portal radiation monitors, which all workers must pass through upon departure from the station. The bag was located within the protected area but outside the RPA. The bag was labeled "caution radioactive material" and was slightly contaminated with manganese-54 and cobalt-60. The exterior of the bag displayed fixed contamination ranging up to 2000 disintegrations per minute(dpm)/100 square centimeters and 1000 dpm removable contamination on its inside surfaces.

Immediate corrective actions taken by the licensee included surveys of the area where the bag was found to verify that no contamination was spread to other areas, and initiating a prompt investigation. Short term corrective actions included the closure of all power block RPA egress points other than the main "4-line" RPA egress in the turbine building, expanded RPT coverage at the main egress point, issuance of an event summary briefing to station department heads for discussion with respective work groups, re-establishment of the greeter program at the entry to the power block RPA, and the assembly of a multi-discipline team of station and contractor personnel to conduct a root cause investigation.

Although the root cause investigation team was unable to identify the individuals(s) involved in discarding the bag or the root cause of the problem, the team concluded that the apparent cause was a poor radiation worker practice. The team attributed the poor practice to inadequate knowledge, training and awareness of station expectations. The licensee discovered that many contract workers currently involved in vacuum usage had

minimal radiation worker experience, including some with no previous nuclear power plant experience. The licensee speculated that a worker inadvertently placed the small bag into a trouser pocket and discarded it after realizing the problem upon attempted departure from the station. The quantity of contamination on the bag was not sufficient to alarm the contamination monitors at the RPA egress had the bag been carried in a worker's pocket. The contamination monitors at the RPA egress are set to alarm at 5000 dpm/100 square centimeters, an acceptable industry standard for such monitors. The bag may have caused the gamma radiation sensitive portal monitors at the MAF to alarm, depending on the location of the bag relative to the detectors, which may have occurred and caused the worker to discard the bag.

The root cause investigation conducted by the licensee was comprehensive, identified weaknesses with the station's control and release of radioactive material in the RPA, and recommended several proposed long term corrective measures. These proposed corrective measures were currently under review by station management. While the licensee has experienced relatively few similar problems over the previous five years, weaknesses identified by the licensee's investigation team included: (1) potential generic problems with the station's contractor selection process; (2) radiation worker training program deficiencies and station oversight of the contractor training process; (3) lack of specific procedural guidance regarding the removal of pocket sized items from the RPA; (4) inconsistent radiological controls for power block and satellite RPA egress; and (5) lack of continual RP oversight of RPA egress activities.

c. Conclusions

The licensee's response to a self-identified incident involving radioactive material found outside the RPA was prompt and aggressive, and included a comprehensive root cause evaluation. Immediate and short term corrective actions were appropriate. Self-identified weaknesses with the radioactive material control program and proposed long term corrective actions were being evaluated by station management.

## R2 Status of RP&C Facilities and Equipment

### R2.1 The Makeup Water System

a. Inspection Scope (IP 84750)

The inspectors conducted a walkdown of the make up water system and the associated in-line instrumentation, and reviewed makeup water quality data. The inspectors also interviewed chemistry and engineering staff regarding the operability and performance of the makeup water system.

b. Observations and Findings

The well water used for producing reactor makeup water was treated through a variety of filtering, chemical additive and demineralization processes to enhance its purity prior to plant use. For example, the water was filtered to remove iron and small particulates,

was combined with sulfates to remove chemical salts and treated to remove carbonates to enhance the efficiency of subsequent reverse osmosis (RO) and demineralization steps. In-line conductivity cells analyzed the water from the demineralizer beds and conductivity monitors read remotely in the radioactive waste (radwaste) control room. The system was designed to shut down when the water from the downstream bed exceeded a specified conductivity. In addition, system shutdown was annunciated in the radwaste control room to alert plant staff to the potential problem.

Makeup water chemistry grab sample data for 1997 and 1998 demonstrated that the quality of the makeup water was excellent, as the conductivity was near the theoretical limit, sulfate and chloride were below 0.5 ppb, and silica less than 5 ppb.

Discussions with plant staff revealed that the operability of this system was excellent, the in-line instrumentation performed reliably, and the system capacity was sufficient to meet all the plant's needs. A walkdown of the system disclosed that the materiel condition of the system was excellent and that there were no work order backlogs. The vendor for this leased system was reported to be very supportive and the licensee's staff was considering installation of this system onsite permanently.

c. Conclusions

The makeup water system was well maintained, and the system effectively met plant needs for ultra-pure water. The reliability and materiel condition of the system components were excellent, as evidenced by water quality data and the system's operating history.

## R4 Staff Knowledge and Performance in RP&C

### R4.1 Performance of In-Plant Chemistry Sample Collection and Analysis

a. Inspection Scope (IP 84750)

The inspectors interviewed chemistry staff and observed in-plant chemistry sampling and analysis activities. The inspectors also interviewed chemistry supervisory staff and reviewed chemistry technician proficiency data for laboratory analyses.

b. Observations and Findings

The inspectors observed that in-plant samples (reactor water, condensate, and radwaste water) were collected in accordance with station procedures. The chemistry technicians (CTs) were experienced and knowledgeable regarding proper sample collection, analysis, and calibration methods. Although the fumehood for the Unit 2 condensate sampling panel was not operating, the inspectors observed that the materiel condition of the sampling panels was generally good with few outstanding work requests. The CTs also exhibited a proper understanding of plant systems and ALARA practices. In particular, the CTs evaluated and adjusted their sampling practices, which

was instrumental in lowering departmental dose by 50% since 1995. The inspectors determined that CT ownership was evident for chemistry work.

The chemistry department conducted annual proficiency tests for each CT. The 1997 tests consisted of analyzing an unknown sample for 11 analytes, with appropriately stringent acceptance criteria. The results were excellent, with only 6 failures in the initial 122 analyses. The failed analyses were corrected by follow up analyses.

c. Conclusions

Chemistry personnel were knowledgeable of their various responsibilities, demonstrated good ALARA practices, displayed ownership of chemistry department activities and conducted work in accordance with station procedures.

## R7 Quality Assurance in RP&C Activities

### R7.1 Quality Assurance/Quality Control for Laboratory Instrumentation and Analyses

a. Inspection Scope (IP 84750)

The inspectors reviewed chemistry quality assurance/quality control (QA/QC) procedures and QA/QC data for both chemistry and radiochemistry laboratory instrumentation. The inspectors also interviewed chemistry supervisory staff regarding laboratory QA/QC.

b. Observations and Findings

The inspectors reviewed the QA/QC data for the following instruments/methods and their associated analyses:

- Ion Chromatography - sulfate, chloride, nitrate, chromate, nitrite, calcium, magnesium, sodium, zinc
- Wet chemistry/titration - boron
- Direct Current Plasma - zinc, iron, copper, chromium, nickel
- Ultraviolet/visible spectrometry - silica
- Gamma Spectrometry - gamma emitting isotopes in air and water
- Liquid Scintillation Counter - tritium in air
- Gas-Flow Proportional Counters - alpha/beta on smears, alpha on air filters, and alpha/beta in water
- Sodium iodide well detector - gross gamma in water

The QC data for chemical and radiochemical laboratory instrumentation indicated that instrument operability had remained within acceptable statistical parameters. The staff effectively utilized QC charts to trend instrument performance, and the laboratory chemists reviewed the data regularly to check for biases, trends, and outliers; and to initiate corrective action. The calibrations for the ion chromatographs were composed of

3 or 4 points over the typical range of the various analyte concentrations during normal plant operations.

The counting room staff tracked peak area, peak width, and peak location to gauge the gamma spectrometry system performance. The liquid scintillation counter, the gas-flow proportional counters, and the gross gamma counter QC data were also reviewed regularly for any adverse trends. The QC charts demonstrated that laboratory instrumentation performance was excellent.

The calibrations and annual verifications of the radiochemical instruments utilized commercial radionuclide standards which were traceable to the National Institute for Standards and Testing (NIST). The inspector noted that the most recent calibrations were conducted in accordance with procedure and comparison to previous calibration data showed that the radiochemistry instruments have remained stable.

The laboratory participated in QA interlaboratory comparison programs for both chemical and radiochemical analyses. For 1997, the chemistry and radiochemistry intercomparison results were excellent, as all reported values were in agreement with the known values.

The materiel condition of the laboratory instrumentation was very good. The inspectors noted that all laboratory reagents were within the prescribed shelf life, and chemistry staff demonstrated the use of a computer database that is used to ensure that no standards or reagents were used beyond the expiration dates.

c. Conclusions

Overall, the QA/QC and materiel condition of the laboratory instrumentation were excellent, as evidenced by QC checks and QA intercomparison data. In addition, the materiel condition of the instruments and control of standards and reagents was effective.

R7.2 Quality Control for In-Line Instrumentation

a. Inspection Scope (IP 84750)

The inspectors reviewed chemistry QC procedures and the QC data for the in-line instrumentation for the most recent calendar quarter. The inspectors also conducted a walkdown of the instrumentation, and interviewed chemistry staff regarding QC practices and the current program to upgrade the in-line instruments.

b. Observations and Findings

The inspectors noted that the licensee has experienced problems with the operability and accuracy for some of the in-line conductivity instruments. In particular, the condensate polisher in-line instruments for both units and the fuel pool meter have been problematic, as monitor and/or recorder failures have rendered the instruments

inoperable. The staff planned to replace many of these instruments as part of an ongoing program to upgrade the in-line instrumentation. As an example of this upgrade program, new feedwater and double de-ionized system in-line meters were recently installed. Accuracy and operability of these new meters were excellent. The staff also considered changing the acceptance criteria of the performance check from the current +/- 10% to +/- 15%, in accordance with the vendor's recommendation.

In conjunction with the implementation of the HWC, the staff installed dissolved oxygen meters on several sampling panels. In addition, installation of dissolved hydrogen and dissolved oxygen/hydrogen dual in-line instruments on various plant systems was planned to monitor the effectiveness of the HWC system. The staff also discussed the possibility of installing in-line electro-chemical potential instruments in conjunction with HWC.

Chemistry staff have effectively overseen the installation of these instruments, and the process to write the procedures governing the calibration, performance check, and maintenance of these meters had been undertaken by the chemistry department.

c. Conclusions

The QC data indicated operability problems with a number of in-line instruments; however, the chemistry staff effectively initiated a program to upgrade these monitors. In addition, the chemistry department's oversight of the installation and management of the in-line instruments associated with HWC was successful.

R7.3 Chemistry Program Audits and Self Assessments

a. Inspection Scope (84750)

The inspectors reviewed the recently developed chemistry self assessment program and the results of the initial self assessment. Results of a recently completed audit of the chemistry, radwaste treatment and effluent/environmental monitoring programs were also reviewed.

b. Observations and Findings

A comprehensive chemistry self assessment program was developed in 1997, to evaluate the overall effectiveness of the chemistry program. Station procedure LCP-610-11, "Chemistry Self Assessment," was developed to provide direction for the scope and focus of the assessment program. Several self assessments are planned to be conducted each year by an assessment team comprised of chemistry supervision and staff. The assessment program included monthly management observation of staff performance and other performance based initiatives.

The initial self assessment conducted in February 1998, was relatively broad in its scope and included system materiel condition, staff training, procedure quality, and instrument calibration and quality control. The assessment identified problems with the reliability of

certain process monitors, and identified the need for improvements in staff knowledge and skill levels, timeliness of preparing certain samples for off-site analyses, and the administration of the contract for the vendor radiochemistry laboratory. Problem identification forms (PIFs) were generated to track the corrective actions for the assessment findings.

A station audit of the chemistry program, radwaste treatment and effluent/environmental monitoring conducted in January 1998, included performance based observations of plant activities, record and procedure review, and worker interviews. The audit concluded that chemistry performance indicators were maintained within goals and radwaste treatment systems were found to be adequately maintained and operated. Recommendations for improvement to procedures and for the development of action plans for other deficiencies were being tracked to ensure timely follow up.

c. Conclusions

A comprehensive chemistry self assessment program was developed and recently implemented by the chemistry staff to assess the overall effectiveness of the chemistry program. The inaugural assessment was broad in its scope and identified problems and areas for improvement within the chemistry program. Assessment and audit findings and associated corrective actions were being appropriately tracked to ensure resolution.

## R8 MISCELLANEOUS RP&C ISSUES

### R8.1 Restart Action Plan Implementation

C.2.2.c: Management Involvement In Self Assessment & Independent Self Assessment Capability

The inspectors reviewed the implementation of the LaSalle Station Restart Action Plan Item 5.3, "Improve Departmental Self-Assessments and Effectiveness," established to improve departmental self assessments so that they identify potential problems prior to their actual occurrence. The Chemistry Department developed a comprehensive self-assessment program to evaluate the effectiveness of the chemistry program. The initial self assessment was conducted by chemistry supervision and staff and consisted of a review of a variety of chemistry program issues. PIFs were generated to document and track the resolution of problems noted during the assessment (See Section R7.3).

### R8.2 Anomalous Neutron Exposure

The inspectors reviewed the licensee's evaluation of an anomalous neutron exposure to the TLD assigned to a plant worker during the fourth quarter of 1997. Licensee processing of the TLD showed a neutron exposure of approximately 2 rem, and a gamma deep dose equivalent of 164 mrem.

Although the worker had run cabling under-vessel in October 1997, when the majority of the 165 mrem gamma dose was received, neither unit had been operating since 1996

and a co-worker involved in the same activities alongside the worker received no neutron exposure. The licensee determined that the worker had not been exposed to other LaSalle neutron sources or sources external to the station. Further licensee investigation attributed the neutron exposure to high concentrations of hydrogen sulfide contained in the well water that supplied the worker's home, particularly in the area where the TLD was normally stored during non-work hours. As described in NRC Information Notice No. 85-81, "Problems Resulting in Erroneously High Reading With Panasonic 800 Series Thermoluminescent Dosimeters", hydrogen sulfide gas causes gross over response in the type of thermoluminescent material used in the licensee's TLD.

The licensee's conclusion that the anomalous neutron exposure was caused by the TLD's exposure to hydrogen sulfide gas was technically sound and supported by air sample measurements and correlated exposure data provided in Information Notice No. 85-81. To prevent recurrence of this problem, the licensee required that the worker store his TLD on-site. Similar actions are being considered for other plant workers.

R8.3 Follow up on Open Items

(Closed) Violation 50-373/374-96014-03: Failure to notify RP prior to conducting work in the radwaste pump aisle. A radwaste operator was performing surveillance activities in the radwaste pump aisle while a tank was being drained. Radiation protection was not informed of the need for an operator to be in the area while the tank was drained. The problem was compounded because the operator was unable to hear the alarms on his electronic dosimetry, because of the high noise levels in the area. The corrective actions to prevent recurrence included improved interdepartmental communications within the radwaste group and between radwaste and RP departments, and the use of electronic dosimetry with ear pieces and visual alarm indicators for work in high noise areas. The licensee conducted ambient noise level measurements in various plant areas and established criteria for enhanced exposure monitoring equipment in these areas. Additional audible level measurements are planned to be collected by the licensee during subsequent unit operations. This item is closed.

## V. Management Meetings

### XI Exit Meeting Summary

The inspectors presented the preliminary inspection results to members of licensee management on February 27, 1998. The licensee acknowledged the findings presented and did not identify any of the documents reviewed as proprietary.

## PARTIAL LIST OF PERSONS CONTACTED

P. Barnes, Regulatory Assurance Manager
D. Bowman, Chemistry Supervisor
F. Dacimo, Site Vice President
N. Hightower, Health Physics Manager
C. Kelley, Lead Health Physics, Operational
S. Kovall, Lead Technical Health Physics
D. Reif, Fuel Handling Supervisor
D. Rhodes, Chemistry Manager
T. Riner, Radiation Protection Supervisor

## INSPECTION PROCEDURES USED

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| IP 83750 | Occupational Radiation Exposure |
| IP 84750 | Radioactive Waste Treatment, and Effluent and Environmental Monitoring |
| IP 92904 | Follow up - Plant Support |

## ITEMS OPENED AND CLOSED

Opened

None

Closed

| | | |
|---|---|---|
| 50-373/96014-03<br>50-374/96014-03 | VIO | Failure to notify radiation protection staff prior to conducting work in the radwaste pump aisle. |

## LIST OF ACRONYMS USED

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|---|---|
| ALARA | As-Low-As-Reasonably-Achievable |
| CFR | Code of Federal Regulations |
| CT | Chemistry Technician |
| DPM | Disintegrations Per Minute |
| EPRI | Electric Power Research Institute |
| FW | Feed Water |
| HWC | Hydrogen Water Chemistry |
| MAF | Main Access Facility |
| NIST | National Institute For Standards and Testing |
| PIF | Problem Identification Form |
| PPB | Parts Per Billion |
| QA/QC | Quality Assurance/Quality Control |
| Radwaste | Radioactive Waste |
| REMP | Radiological Environmental Monitoring Program |
| RP | Radiation Protection |
| RPA | Radiologically Posted Area |
| RPT | Radiation Protection Technician |
| RWP | Radiation Work Permit |

## PARTIAL LIST OF DOCUMENTS REVIEWED

ALARA Plan for Packaging and Shipping Activated Hardware From Refuel Floor

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|---|---|
| RWP No. 980230 (Rev 0) | Package and Ship Activated Hardware from Refuel Floor |
| 10 CFR 50.59 Safety Evaluation (No. L98-065) | Loading and Handling of the Various Shipping Containers for the Fuel Pool Cleanup Project |
| PIF No. L1998-01209 and Draft Root Cause Report | Radioactive Material Outside the Radiologically Posted Area |
| Station Procedure No. LAP-900-26 (REV 20) | Control of Materials for Conditional or Unconditional Release from Radiologically Posted Areas |
| Station Procedure No. LAP-2200-7 (REV 0) | ALARA Plan |
| Station Procedure No. LCP-810-28 (REV 4) | Calibration & Performance Tests of the Packard Tri-Carb Liquid Scintillation Counter, Model 2500 TR |
| Station Procedure No. LCP-810-30 REV 2) | Calibration & Performance Test of the Nuclear Data Gamma Spectrometry System |
| Station Procedure No. LCP-810-19 (REV 5) | Analysis and Evaluation of QC Samples in the Chemistry Lab |
| Station Procedure No. LCP-810-31 (REV 1) | Calibration & Performance Test of the Canberra Sodium Iodide Detector Well Counter System |
| Station Procedure No. LCP-810-32 (REV 2) | Calibration & Performance Test of the Tennelec Alpha/Beta Proportional Counter, LB 5100 Series 2 |
| Station Procedure No. LCP-810-6 (REV 8) | Quality Control Performance Check for Conductivity Cells & Instrumentation |
| Station Procedure No. LCP-720-11 (REV 4) | Chemical/Source Inventory Usage |
| Station Procedure No. LCP-810-20 (REV 6) | Chemistry Technician Annual Proficiency Test |
| Station Procedure No. LCP-310-2 (REV 11) | Sampling of Plant Process Water |
| Station Procedure No. LCP-610-11 (REV 0) | Chemistry Self Assessment |