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Licensee:	Commonwealth Edison Company (ComEd)
Facility:	LaSalle Nuclear Generating Station, Units 1 and 2
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EXECUTIVE SUMMARY

LaSalle Nuclear Generating Station, Units 1 and 2
NRC Inspection Report 50-373/99023(DRS); 50-374/99023(DRS)

This routine, announced inspection evaluated the effectiveness of the licensee's radiation protection program during the Unit 1 refueling outage and focused on dose management and the implementation of the as-low-as-is-reasonably-achievable (ALARA) program, the control and oversight of radiological work, radiation worker (radworker) performance and station assessment activities. A problem with the renewal of the licensee's quality assurance program for use of radioactive material packages under the General License provisions of 10 CFR Part 71 was also reviewed. The following conclusions were made in these areas:

Plant Support

- The radiation protection department was adequately involved in the outage work planning process, and an effective interface with the work control organization existed. ALARA initiatives, generally good work planning and improved radiological work control and oversight produced the lowest collective refueling outage dose in station history (Section R1.1).

- The ALARA program was generally implemented effectively. ALARA plans were adequately developed and sufficiently thorough, as warranted by the potential job hazards, and their consistency and quality was improved. ALARA initiatives and associated engineering controls were properly established in most instances, and efforts to reduce dose were generally successful (Section R1.2).

- Deficiencies with pre-job dose assessments and documentation for planned personnel contamination events and intakes were identified by the inspectors and were addressed by the licensee during the inspection (Section R1.2).

- Radiation protection staff oversight and control of radiological work for the outage was generally effective. (Section R1.3).

- Source term reduction strategies were implemented effectively and included a new initiative to achieve future station dose savings through the noble metals injection program. Licensee management invested additional resources in the zinc injection process by using depleted zinc, which is more efficient at source term reduction. Rapid identification of a leaking fuel assembly minimized any outage effect (Section R1.4).

- The inspectors and licensee observed failures of the RP staff to correct radworker performance. Poor work practices contributed to a large number of personnel contamination events and lost dosimetry (Section R4.1).

- Radiological postings were adequately maintained and accurately reflected the radiological conditions, and high and locked high radiation areas were controlled consistent with regulatory requirements. Appropriate contamination control practices

were observed at work sites, and radiological controls for work activities were as prescribed by the ALARA plan and the radiation work permit (Section R4.2).

- Container labeling and labeling procedure deficiencies were identified by the inspectors and acknowledged by radiation protection management. Actions to correct the deficiency were being considered (Section R4.2).

- Outage staffing and training for the radiation protection (RP) program was generally effective. The selection process for contract RP technician staff was rigorous, and the contract RP staff experience was factored into assigned outage tasks (Section R5.1).

- The RP organizational scheme contributed to the overall effectiveness of the outage RP program (Section R6.1).

- The Nuclear Oversight department assessments of the outage RP program were well planned and staffed, properly focused and added value to the program (Section R7.1).

- The station made one Type B shipment of radioactive material without an NRC approved 10 CFR Part 71 quality assurance program, resulting in a Non-Cited Violation (Section R8.1).

Report Details

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 Radiological Planning For the Refueling Outage

a. Inspection Scope (83750)

The inspectors reviewed the radiological planning and dose goal development for the planned 26-day Unit 1 refueling outage (L1R08) and assessed the station's overall outage dose performance. Outage work activities, scheduling information and dose projection and work planning practices were reviewed; selected jobs were assessed; outage planning and ALARA staffs were interviewed; and work control processes were observed throughout the station.

b. Observations and Findings

Several initiatives were implemented for the first time or used more extensively and effectively for the refueling outage. For example, prior to the outage, station work groups developed detailed outage task (step-by-step) breakdowns. Designated task owners met with the radiation protection (RP) staff to refine dose projections and to work together in a team approach to develop ALARA plans and to devise ways to reduce job specific dose. The detailed task-to-dose breakdown, or "fragnet" process, was implemented extensively for the first time during the outage along with a new "project view" software package that was used to better schedule and plan work activities. Also, RP department outage planners were integrated directly into the outage work execution center (WEC) for the first time and functioned effectively as liaisons between the RP staff and other station organizations throughout the outage. Specifically, two RP outage planning representatives were continually present in the WEC and ensured that radiological impediments for a given job activity were recognized and addressed, that alternatives to reduce source term and other dose reduction initiatives were evaluated by the WEC before work was authorized to commence, and that the overall scheduling and work logic for the outage was improved.

Inspector observations of outage work processes which included WEC activities, reviews of work packages and schedules, and discussions with RP outage planning staff disclosed that the RP organization was effectively integrated into the outage work planning process.

The licensee's initial outage dose estimate based on historical radiation work permit (RWP) data for similar work was 326 rem, but was refined using the dose fragnet process. After ALARA reviews were completed, a collective work group goal of approximately 251 rem was established. Subsequently, a 200 rem stretch (or challenge) goal was established, which equated to a 40% dose reduction compared to the previous Unit 1 refueling outage in 1996, when 334 rem was expended for similar scope work.

Radiologically significant outage activities and associated challenge dose goals included drywell in-service-inspection (ISI) (29 rem), control rod drive replacement (14 rem), motor operated valve repair and maintenance (10.8 rem), safety relief valve refurbishment (7.6 rem), recirculation suction valve (F023-B) modification and maintenance (8 rem) and reactor disassembly and reassembly activities (7.8 rem). The licensee also projected a stretch goal of 2.6 rem for noble metal setup and injection activities, a new initiative intended to reduce the station's source term.

The outage was completed in 30 days, exceeding the station's goal by four days. The total dose expended for the outage was 215 rem, about 14% less than the working group's goal but exceeding the licensee's 200 rem stretch goal. About 7 rem was attributed to emergent work and rework, most of which took place late in the outage. Although the dose for most work activities was less than that projected, some radiologically significant work exceeded the dose goals. Two examples of jobs that exceeded dose goals by approximately 40 percent were the F023-B valve and drywell scaffolding work. The licensee determined that the cause for the dose projection inaccuracies included valve rigging problems in the drywell and the assembly/ disassembly of scaffolding to accommodate drywell work. The dose for under vessel instrumentation maintenance was over 8 rem greater than projected; however, RP management believed that the dose projections may have been underestimated when work group goals were determined. Dose expended for drywell ISI activities was significantly less than projected because only minimal weld preparation work was necessary thereby reducing the time spent in higher drywell dose fields, and because several good ALARA initiatives were in place to reduce dose to ISI workers and RP support for these activities was strong.

Overall, the inspectors found that ALARA initiatives, generally effective work planning and the RP staff's improved control and oversight of radiological work positively impacted dose performance and produced the lowest collective dose for a refueling outage in the station's history.

c. Conclusions

The RP department was adequately involved in the outage work planning process and an effective interface with the work control organization existed. ALARA initiatives, generally good work planning and improved radiological work control and oversight produced the lowest collective refueling outage dose in station history.

R1.2 ALARA Program Implementation

a. Inspection Scope (83750)

The inspectors evaluated the effectiveness of the licensee's radiological engineering controls and work practices and the results of efforts to reduce dose and implement the ALARA program for L1R08. The inspectors interviewed radiation workers (radworkers) and members of the RP staff; reviewed ALARA plans and RWPs including total effective dose equivalent (TEDE) ALARA evaluations, justification for planned personnel contamination events and applicable procedures; and observed outage work throughout the station.

b. Observations and Findings

Radiation work permits, ALARA plans and associated TEDE ALARA evaluations and related information for fourteen radiologically significant outage jobs were selectively reviewed and included:

- Suppression Pool Dive: Instrumentation, Cabling and Inspection
- Remove/Replace 1B33-F051A/B, 1B33-F052A/B Valves
- Repair of the 1B33-F023B Valve
- Disassemble and Reassemble Reactor Vessel for Refueling
- Remove/Replace Control Rod Drives
- SRM/IRM Drive Cable, Drive Mechanism, Detector and Dry Tube Replacements
- Perform In-Vessel Activities, Jet Pump and Nozzle Flushes

As-low-as-is-reasonably-achievable plans reviewed by the inspectors were generally comprehensive as warranted by the potential job hazards, and their quality and consistency had improved since previously reviewed (Inspection Report 50-373/374/99005(DRS) and 50-373/374/99009(DRS)). Lessons learned and industry experiences were incorporated into ALARA planning, and those plans for radiologically significant work included more detailed radiological controls to address problems that occurred in the past. Additionally, specific radiological contingencies were listed to address the potential for transuranic isotopes resulting from a fuel leak that emerged during the operating cycle and to ensure that previous station problems with noble gas and iodine recognition during primary system breaches were not repeated.

The dose fragnet process discussed in Section R1.1 improved the effectiveness of the ALARA program because more detailed job reviews identified additional opportunities for dose savings. The inspectors noted, however, that some steps in the ALARA procedure were confusing and that RWPs were not always consistent in the level of detail for "stop work" conditions and for identifying which tasks were "high risk" work, both which the licensee recognized and planned to correct.

The inspectors noted that appropriate engineering controls were used routinely to reduce general area dose rates including hydrolyzing of pipes and valves and generally judicious use of temporary shielding, although some shielding deficiencies were identified by the licensee as described in Section R1.4. High efficiency particulate air (HEPA) filter equipped portable ventilation and vacuum systems were used adequately to control airborne contaminants. As in past outages, remote video and dosimetry monitoring systems were used as ALARA tools for under-vessel work, suppression pool activities and in other areas, as warranted by the radiological conditions and the technology available.

Personnel contaminations and, on occasion, small intakes of radioactive material were planned as dose savings methods, if ALARA evaluations determined that worker efficiency would be improved and TEDEs would be reduced without the use of respiratory protection equipment or performed with less restrictive protective clothing (PC). For example, the licensee relaxed PC requirements for heat stress purposes and to improve worker efficiency for work under-vessel and in the drywell and torus, and approximately 15 small intakes and over 30 personnel contamination events (PCEs)

were planned as ALARA initiatives. Inspector reviews of selected TEDE ALARA evaluations concluded that they adequately supported the licensee's decision to not use respiratory protection equipment and to justify the planned intakes. The inspectors also verified that the licensee's skin and intake dose assessment methodology was technically sound and that dose assessments completed after PCEs and intakes occurred were accurate. The inspectors confirmed that none of the planned PCEs or intakes that occurred during the outage resulted in significant dose consequences and that all reported doses were less than 0.5% of applicable NRC regulatory limits in 10 CFR Part 20. However, the inspectors identified that the licensee had not projected the magnitude or the range of doses anticipated for planned PCEs nor thoroughly documented pre-job dose assessment results before the planned evolution took place. After this deficiency was brought to the licensee's attention, RP staff completed a skin dose assessment for planar contamination based on the station's current isotopic mix, which conservatively bounded and better documented the dose from planned PCEs. The assessment was reviewed by the inspectors who determined that it adequately addressed the deficiency.

c. Conclusions

The ALARA program was generally implemented effectively. ALARA plans were well developed and sufficiently thorough consistent with potential job hazards, and their consistency and quality was improved. ALARA initiatives and associated engineering controls were properly established in most instances and efforts to reduce dose were generally successful. Inspector identified deficiencies with pre-job dose projections and documentation for planned PCEs and intakes were corrected by the licensee during the inspection.

R1.3 Control and Oversight of Radiological Work

a. Inspection Scope (83750)

The inspectors observed and evaluated the RP staff's control and oversight of radiological work in the reactor building and other areas and attended RP and WEC day-shift turnover meetings.

b. Observations and Findings

Radiological work oversight and RP staff job coverage was generally effective as evidenced by proper implementation of ALARA initiatives, adequate control of contaminated areas and equipment and the lack of any significant radiological work related problems attributed to inadequate RP staff work control. Radiation protection technicians (RPTs) were observed coaching workers and properly controlling jobs. Radiation protection control points were used effectively in a variety of station locations to better communicate with work crews and oversee the work force.

For example, one of the inspectors attended the pre-job briefing and observed the suppression pool filter removal job conducted under RWP 991016. Similar to other outage work packages reviewed by the inspectors, job planning was detailed and also focused on overall safety both radiological and industrial. The pre-job briefing was

divided into two parts: diver safety and radiological controls. Individual briefings were well organized, and worker safety was emphasized as the job steps were detailed by the presenters. The work plan contained a job mock-up in which all steps were performed including a walkdown of the pathway for filter transport from the suppression pool to a high integrity container. The mock-up training identified that one of the job steps involving a filter lift necessitated a minor scaffolding modification which allowed the lift to be completed more easily. The job planning and mock up training was effective as evidenced by the work being completed without significant radiological or industrial safety problems. Communication among the work groups by radio headsets provided for efficient coordination of job steps. Teamwork among the work groups was evident with the groups supporting each other, especially in prevention of heat stress which was a problem due to temperature, humidity and protective clothing requirements. The ALARA provisions for the job were implemented effectively, and the job was completed for less dose than originally anticipated.

Although overall radiological control and oversight of outage work activities were generally effective, some deficiencies in work control and radworker oversight were noted. For example:

- During the back-shift on November 8, 1999, the inspectors witnessed about 12 contract and station workers associated with under-vessel repair of a control rod drive (CRD) staged at the drywell bullpen area for an excessive period. The workers, including two dressed in supplied air bubble suits, waited for over five hours while other preparatory work on the refuel floor was being completed so that the under-vessel work could commence. While the RP drywell coordinator recognized the problem and communicated the concern to the WEC, authorization for the work crew to leave the RPA and return when the job was ready to be worked was not granted. Although the workers did not accrue significant exposure (bullpen dose rates were low), unnecessary dose was expended, and the long delay could have potentially affected the work crew's focus. A problem identification form (PIF) was generated, and the problem was addressed by station management.

- Over 20 instances occurred during the outage when worker dosimetry was lost or misplaced due to poor radworker practices, insufficient coaching by the RP staff, or inadequate work oversight. Many of the instances occurred in the drywell because dosimetry was improperly placed on PCs. The inspectors noted that guidance for dosimetry use and placement at the drywell control point was at times confusing and/or not properly enforced.

- Radworker performance deficiencies occurred throughout the outage (Section R4.1). The inspectors noted that some of these problems could have been avoided had workers been better coached and had work practices been more closely scrutinized by the RP staff. Also, nuclear oversight field observations identified instances of poor radworker practices in the presence of RP staff, which were not corrected until the auditor made the staff aware of the problem.

Radiation protection management acknowledged the dosimetry and radworker performance issues, recognized the weaknesses in the RP staff's actions to correct radworker performance issues, and was contemplating actions to address this deficiency.

c. Conclusions

Radiation protection staff oversight and control of radiological work for the outage was generally effective.

R1.4 Source Term Reduction Program

a. Inspection Scope (83750)

The inspectors reviewed the licensee's plans for area dose rate reduction in radiologically protected areas (RPAs) and evaluated the source term reduction program. The inspectors interviewed the RP and chemistry staffs, reviewed source term data and performed plant walkdowns. The noble metals injection project, which was a major initiative during this outage, was also reviewed.

b. Observations and Findings

The source term reduction program included temporary shielding for the outage, hydrolyzing and flushing of piping systems and components, the zinc injection program and implementation of the noble metals injection process.

Portions of several suction penetration sleeves from the suppression pool were flushed including the high pressure core spray system, low pressure core spray system, residual heat removal system and reactor core isolation coolant system. Also, the floor of the suppression pool was vacuumed and the SCRAM discharge volume was hydrolazed. These initiatives reduced dose rates significantly and also reduced localized areas of elevated radiation (hot spots). The licensee indicated that this work reduced the amount of high radiation areas in the affected regions by approximately 1600 square feet.

Approximately 36,000 pounds of temporary drywell shielding was installed for the outage, similar to previous outages. Dose reduction factors of 2-4 were estimated with an installation and removal cost of 3.8 and 1.5 person-rem, respectively. The licensee reviewed the results of the lead shielding installation project for the outage and determined that a number of packages might not have been warranted based on limited or lack of work in some of the areas shielded. The review also demonstrated that certain packages should have been installed at the onset of the outage in order to achieve maximum dose reduction rather than during the outage. The licensee planned to incorporate the shielding program deficiencies into its lessons learned data base to improve future work schedule coordination.

The licensee implemented noble metals injection at the beginning of this outage in order to reduce radiation levels from the hydrogen water chemistry (HWC) program. The HWC program reduces the potential for intergranular stress corrosion cracking (IGSCC) by lowering the electrochemical potential (ECP) inside the reactor and associated

piping. Research has established that the ECP required to protect reactor internals from IGSCC could be achieved with reduced levels of hydrogen addition when a thin coating of certain noble metals, such as platinum and rhodium, were deposited on boiling water reactor (BWR) internal surfaces. The reduced hydrogen addition also generates less nitrogen-16 (N-16) in the main steam, which results in lower dose rates in certain areas when the reactor is operating.

The noble metals injection project was conducted for the licensee by a vendor. Preliminary results indicated that the required process parameters were achieved including the noble metal thickness on deposition coupons used to estimate the plate-out of the platinum and rhodium complexes on the reactor surfaces. Comparing the vendor's data with industry results indicated that the licensee's hydrogen addition rate for achieving the necessary ECP could be in the range of other BWRs that have effectively used this process and achieved much lower N-16 radiation levels. The effectiveness of this process, however, cannot be determined until sufficient operating history and radiological data is accumulated.

The licensee's zinc injection system has been in operation for several years. This process reduces dose rates from cobalt-58 and cobalt-60. The licensee uses depleted zinc which is much more costly but has virtually no zinc-64 that activates in a neutron flux to zinc-65 which has a half life of 244 days and emits 1115.5 kilo-electron volt (KeV) gamma radiation during its decay process. Although the use of normal zinc containing zinc-64 has been shown to reduce the source term, the use of depleted zinc has a greater impact on source term reduction because no radioactive zinc-65 is produced.

On March 25, 1999, the licensee noticed an increase in off-gas (noble gas fission products) levels and dose equivalent iodine (DEI) which indicated a fuel leak. The leaking bundle was located with fuel vendor assistance, and control rods were inserted around this bundle to suppress it. The licensee's timely response to this situation resulted in the leaking bundle having little or no impact on outage dose rates.

An internal RP self-assessment, Radiation Protection 4th Quarter Focus Self-Assessment Report 00017085-54-01 which was conducted by both station and corporate RP personnel from October 25-28, 1999, identified a weakness in the "hot spot" tracking system. Problems with hot spot survey frequency and tracking and an isolated posting problem were identified by the assessment and problem identification forms (PIFs) were generated to document the problems and to develop corrective actions.

c. Conclusions

Source term reduction strategies were implemented effectively and included a new initiative to achieve future station dose savings through the noble metals injection program. Licensee management invested resources in the zinc injection process by using depleted zinc which is more efficient at source term reduction. Rapid identification of the leaking fuel assembly minimized any outage effect.

R4 Staff Knowledge and Performance in Radiation Protection and Chemistry

R4.1 Evaluation of Radiation Worker (Radworker) Performance

a. Inspection Scope (83750)

The inspectors evaluated radworker performance during the refueling outage through direct observation of work practices, discussions with work crews and RP staff, and review of selected PIFs and PCE reports.

b. Observations and Findings

The inspectors observed work practices in the drywell and at other outage job sites throughout the station. Radworker performance was generally adequate but needed improvement. For example, there were 78 unplanned PCEs during the outage, and approximately one-third were caused by poor radworker practices such as touching unprotected skin with contaminated gloves or brushing against contaminated items. Some of the PCEs resulted in intakes; however, the dose consequences were minimal. Also, there were numerous instances of lost dosimetry attributed to poor work practices, as the radworkers often forgot to retrieve their dosimetry when leaving the exit point or left their dosimetry in their discarded protective clothing. While the RP staff coached workers in an effort to improve radiological work practices, the coaching was not sufficient given the relative inexperience of the work force. The inspectors noted, for example, that workers were not coached at most contaminated area egress locations including the drywell, despite the dosimetry problems. Also, as discussed in Section R1.3, nuclear oversight auditors identified radworker practice deficiencies in the presence of RP staff, which had not been corrected until brought to the staff's attention by the auditor.

The inspectors reviewed selected PIFs generated during the first two weeks of the outage to determine the extent of radiation protection problems identified by the licensee. The review disclosed negative trends involving the number of PCEs and lost dosimetry, which the licensee also recognized. Although members of the RP staff participated in pre-outage nuclear general employee training (NGET) to help the trainees better understand requirements for radiological work, RP management realized during the outage that more rigorous coaching and training was needed. Radiation protection management planned to capture this problem as an outage lessons learned.

The licensee used the "greeter" program to ensure radworkers were aware of radiological requirements. Workers entering the RPA were questioned by the greeters about their RWP number, electronic dosimetry set points and radiological work conditions and greeter logs were kept to document problems. Problem identification form trending information showed that the effectiveness of the greeter program improved as the outage progressed.

c. Conclusions

The inspectors and licensee observed failures of the RP staff to correct radworker performance. Poor work practices contributed to a large number of personnel contamination events and lost dosimetry.

R4.2 Plant Walkdowns and Other Observations

a. Inspection Scope (83750)

The inspectors conducted walkdowns of the Unit 1 and 2 reactor and turbine buildings and reviewed radiological posting and labeling, housekeeping and overall work practices.

b. Observations and Findings

Radiological postings for both Units 1 and 2 were properly maintained, and the inspectors determined through survey record review that selected radiation and high radiation areas were posted to accurately reflect the area radiological conditions. The inspectors also verified that high and locked high radiation areas were controlled consistent with regulatory requirements.

Appropriate contamination control practices were established at those job sites observed by the inspectors, and ALARA controls for selected jobs were as prescribed by the ALARA plan and RWP. Radiological housekeeping was adequate as hoses and other items that crossed contamination area boundaries were noted to be secured properly. Contaminated items were bagged, surveyed by the RP staff and labeled and tagged appropriately. Tools and other materials used in the RPA were controlled consistent with station procedure; however, two skull caps with small quantities of fixed contamination were found in a trash container outside the RPA. The licensee's investigation concluded that the skull caps were likely worn by workers under their hard hats as they exited the RPA, and were not detected by the personnel contamination monitors because the contamination levels were very low and shielded by the head gear. The licensee increased RPA greeter and worker awareness of this problem, which did not reoccur during the outage.

The inspectors observed containers such as gang boxes and storage cabinets that housed radioactive material were labeled inconsistently in that some included tags with additional radiological information and others did not. The inspectors also identified that the procedure governing the radiological posting and labeling program lacked specific labeling criterion. Radiation protection management acknowledged the deficiency and planned to revise the procedure and to alter the station's labeling practices. The new radiation protection manager (RPM) also planned to improve those postings that provided general area dose rate information, based on good practices implemented at other industry facilities.

During a drywell walkdown, the inspectors noted that a swing gate at the top of an approximate 30-foot high ladder that was regularly used by workers did not automatically close as designed, representing a potentially significant industrial hazard.

The problem was brought to the licensee 's attention and repaired that same day. However, one drywell worker informed the inspectors that the swing gate malfunctioned for several days prior to the inspectors arrival.

c. Conclusions

Radiological postings were adequately maintained and accurately reflected the radiological conditions, and high and locked high radiation areas were controlled consistent with regulatory requirements. Appropriate contamination control practices were observed at work sites and radiological controls for work activities were as prescribed by the ALARA plan and RWP. Container labeling and labeling procedure deficiencies were identified by the inspectors and acknowledged by RP management. Actions to correct the deficiency were being considered along with improvements to general area postings.

R5 Staff Training and Qualifications in Radiation Protection and Chemistry

R5.1 Outage Staffing, Training and Qualifications for the Radiation Protection Organization

a. Inspection Scope (IP 83750)

The inspectors reviewed the outage staffing plan for the RP program and the qualifications and training of contract RP staff. The inspectors interviewed RP personnel that coordinated training and assigned duties for contract radiation protection technicians (CRPTs), and discussed the training program with license staff.

b. Observations and Findings

The licensee supplemented the in-house RP staff with 46 contract radiation protection technicians (CRPTs) which included 42 senior RPTs and 4 junior RPTs. In addition, 2 contractor control point monitors, 9 supervisory and 5 ALARA personnel were brought in for the outage along with RP supervisory personnel from other ComEd stations.

Prior to hiring CRPTs, RP supervision reviewed candidate resumes and contacted previous employers to verify experience and references. Industry standardized qualification criteria was established for senior and junior CRPTs. Training requirements included a minimum score of 80 percent on the standardized Northeast Utilities Health Physics Theory Exam and validation of radiological work skills. As part of the on-the-job-training process, CRPTs were required to demonstrate basic RP job skills. Work assignments were based, in part, on their experience. Individuals having greater experience covering jobs with greater radiological risk received assignments in radiologically more challenging areas. More then 50 percent of the CRPT staff came directly from the Dresden refueling outage, so that the CRPTs were familiar with licensee practices, procedures and management expectations. The size of the RP staff was adequate for the outage work.

c. Conclusions

Outage staffing and training for the RP program was generally effective. The selection process for CRPTs was rigorous, and the contract RP staff experience was factored into assigned outage tasks.

R6 Radiation Protection and Chemistry Organization and Administration

R6.1 Outage Radiation Protection Organization

a. Inspection Scope (83750)

The inspectors reviewed the RP outage organization and evaluated its effectiveness in controlling radiological work and implementing the outage RP program. The inspectors also reviewed recent changes made within the RP organization.

b. Observations and Findings

The inspectors reviewed the qualifications of the new RPM, who began work at the station in late October at about the same time as the outage commenced. The inspectors reviewed the new RPM's resume and the licensee's assessment of the individual's qualifications and verified that the individual satisfied the qualification requirements of Technical Specification 6.1.D by virtue of over 20 years experience in applied health physics at other commercial boiling water reactors. The licensee also recently appointed a new supervisor of RP operations, an individual with several years applied health physics experience at the licensee's sister stations. In order to reduce the impact on the outage RP program and ensure a better transition, the former (acting) RPM and the radiological operations supervisor both remained at the station during the outage to assist the newly assigned individuals.

The RP organization was divided into two twelve-hour shifts, and a WEC RP liaison was designated for each shift. During the first half of the outage, the former RPM served as the outage shift manager working the day shift and was assisted by the new RPM and the RP field supervisor. The WEC RP liaison was responsible for RP outage management during the back shift. For the second half of the outage, the former RPM remained as the outage RP manager but worked the back shift, as the new RPM and RP field supervisor remained on day shift duty. This organizational concept worked effectively as sufficient RP management oversight existed around the clock.

Work oversight was divided by plant location which included the drywell, refuel floor, reactor building and turbine building, and a first line supervisor (FLS) was responsible for command and control of radiological activities in each designated zone. Also, an ALARA analyst was dedicated to each plant location and was responsible for ALARA job planning and implementation of ALARA initiatives for that area. Radiation protection management selected individuals to supervise various zones, based on experience relative to the work planned for that zone. During plant walkdowns, the inspectors noted that the FLS and ALARA analysts had adequate field presence to oversee the zone work. The inspectors found that the outage organizational scheme promoted ownership

of radiological work and helped ensure that appropriate oversight existed. In particular and as discussed in Section R1.1, the WEC RP liaison concept worked effectively to integrate RP into the job planning process and to improve outage decision making and work logic.

c. Conclusions

The RP outage organizational scheme contributed to the overall effectiveness of the RP program.

R7 Quality Assurance in Radiation Protection and Chemistry Activities

R7.1 Nuclear Oversight Assessment Activities for the Outage

a. Inspection Scope (83750)

The inspectors interviewed Nuclear Oversight (NO) audit staff and reviewed the NO outage assessment plan and the results of ongoing RP program assessment activities.

b. Observations and Findings

The assessment plan described in detail the areas that were to be assessed during the outage and included performance based field observations to evaluate worker practices and human performance in the RPA. The plan listed the specific activities to be reviewed and the worker attributes to be evaluated. The inspectors found that the audit staff possessed significant experience in radiation protection and health physics, and included a specialist from another utility that assisted in a pre-outage assessment of the RP program.

Assessment activities were conducted round-the-clock throughout the duration of the outage and included a two phase outage readiness assessment of the RP program, which focused on the ALARA program and source term reduction initiatives. The readiness assessment identified deficiencies with the completeness and accuracy of some ALARA plans and RWP packages, which were corrected and reassessed just prior to outage commencement and found to be improved. The readiness assessment also identified deficiencies with the "hot spot" survey and tracking program and with radworker performance, as discussed in Sections R1.4 and R4.1, respectively.

The inspectors found that assessment activities were of sufficient scope and depth and focused on human performance issues that were previously found to be deficient, and that the assessments added value to the RP program.

c. Conclusions

The Nuclear Oversight department's assessment activities of the outage RP program were well planned and staffed, properly focused and added value to the program.

R8 Miscellaneous Radiation Protection and Chemistry Issues

R8.1 Quality Assurance Program for the Use of Type B Packages

The inspectors reviewed a problem associated with the recent expiration of the licensee's quality assurance (QA) program for use of certain radioactive material packages, which is governed by the requirements of 10 CFR 71.12. That regulation requires NRC approval of a licensee's QA program for use of Type B packaging, which the licensee last obtained in 1994. The QA program approval was obtained and coordinated by a corporate group. The NRC approval was granted for a period of five years and expired on August 31, 1999. The licensee did not realize that the QA program approval had expired, and on September 9, 1999, made a radioactive waste shipment in a Type B package to a licensed burial site without a valid, NRC approved QA program as defined in 10 CFR 71.

10 CFR 71.12 states, in part, that a general license to transport licensed material, or to deliver licensed material to a carrier for transport, applies only to a licensee who has a quality assurance program approved by the Commission as satisfying the provisions of Subpart H of 10 CFR Part 71. However, as described above, on September 9, 1999, the licensee transported licensed material in a Type B package under the general license pursuant to 10 CFR 71.12, and the licensee did not have a quality assurance program approved by the commission, in that the licensee's QA program approval expired on August 31, 1999.

The shipment of radioactive material in Type B packaging without a valid, NRC approved QA program is a violation of 10 CFR 71.12. This Severity Level IV violation is being treated as a Non-Cited Violation (NCV), consistent with Appendix C of the NRC Enforcement Policy (NCV 50-373/99023-01(DRS); 50-374/99023-01(DRS).

After the violation was brought to the licensee's attention, shipments using Type B packaging were suspended at all the licensee's stations, and an investigation by the licensee's corporate office was initiated. Problem identification form # L1999-04715 was generated, and the violation was entered into the licensee's corrective action program. The corporate investigation found that the QA program had also expired in 1984 and 1994, and was not renewed timely. The inspectors verified that the Type B shipment made on September 9, 1999, satisfied the transport provisions for Type B material and that the Type B packaging was prepared in accordance with the applicable cask Certificate of Compliance. The inspectors also reviewed the licensee's plans to prevent recurrence, which included training to each station's shipping specialist about the QA program requirements and regulations, and the establishment of a corporate system to track permit and license status.

V. Management Meetings

XI Exit Meeting Summary

The inspectors presented the inspection results to Mr. Benjamin and other licensee management and staff at the conclusion of the site inspection on November 12, 1999. The licensee acknowledged the inspection findings and identified no proprietary information. The inspectors obtained and reviewed additional outage performance information subsequent to the site inspection and further discussed the inspection findings in a teleconference with RP management on November 24, 1999.

PARTIAL LIST OF PERSONS CONTACTED

J. Benjamin, Site Vice President
B. Blaine, Generation Support Radiation Protection
D. Enright, Outage Manager
J. Estes, Radiation Protection Supervisor
R. Gilbert, Operations Manager
M. Hayworth, Nuclear Oversight
D. Hieggelke, Nuclear Oversight
C. Kelley, Outage Planner
S. Kovall, Health Physicist/Shipping Specialist
D. Minkiwitz, Chemist
R. Morgan, Work Control
M. Phalen, Radiation Protection Supervisor
J. Richardson, Human Resources Supervisor
B. Riffer, Quality and Safety Assessment Manager
J. Schuster, Regulatory Assurance
F. Spangenberg, Regulatory Assurance Manager
R. Stachniak, Nuclear Oversight
S. Taylor, Radiation Protection Manager
E. Wolfe, Source Term Reduction Coordinator
M. Wolfe, Health Physicist

INSPECTION PROCEDURES USED

IP 83750	Occupational Radiation Exposure

ITEMS OPENED AND CLOSED

Opened and Closed

50-373/99023-01 50-374/99023-01	NCV	Conducting radioactive material shipments under the general license provisions of 10 CFR Part 71, with an expired quality assurance program.

Others Closed

None

LIST OF ACRONYMS USED

AAR	ALARA Action Review
ACE	Apparent Cause Evaluation
ALARA	As-Low-As-Is-Reasonably-Achievable
BWR	Boiling Water Reactor
CEDE	Committed Effective Dose Equivalent
CFR	Code of Federal Regulations
CRPT	Contract Radiation Protection Technician
DEI	Dose Equivalent Iodine
ECP	Electrochemical Potential
ED	Electronic Dosimeter
FLS	First Line Supervisor
HEPA	High Efficiency Particulate Air
HWC	Hydrogen Water Chemistry
IGSCC	Intergranular Stress Corrosion Cracking
INPO	Institute For Nuclear Power
ISI	In-Service-Inspection
KeV	Kilo-electron Volt
MV	Millivolt
N-16	Nitrogen 16
NCV	Non-Cited Violation
NGET	Nuclear General Employee Training
NO	Nuclear Oversight
PCE	Personnel Contamination Event
PIF	Problem Identification Form
QA	Quality Assurance
QC	Quality Control
Radworker	Radiation Worker
RP	Radiation Protection
RPA	Radiologically Protected Area
RP&C	Radiological Protection and Chemistry
RPM	Radiation Protection Manager
RPT	Radiation Protection Technician
RWP	Radiation Work Permit
TEDE	Total Effective Dose Equivalent
WEC	Work Execution Center

PARTIAL LIST OF DOCUMENTS REVIEWED

Station Procedures

LAP-2200-7 (Rev 1)	ALARA Plan
NSP-ER-1001 (Rev 1)	Failed Fuel Response Process Description
NRP 5000-4 (Rev 2)	Procedure for Processing of Contract Radiation Protection Technicians
LRP 5010-1 (Rev 08)	Radiological Posting and Labeling Requirements

RWPs and ALARA Plans

RWP # 991016 (Rev 1)	U-1 Suppression Pool Dive Activities and Support
RWP # 991016 (Rev 1)	Suppression Pool Filter Plan Addendum
RWP # 991019 (Rev 1)	SRM/IRM/LPRM/RPIS Connector Repair and Testing
RWP # 991029 (Rev 1)	Remove/Replace Various SRVs
RWP # 991053 (Rev 2)	Noble Metal Modification
RWP # 991050 (Rev 1)	1B33C001A/B; Replace Seals
RWP # 991055 (Rev 1)	Support Work For SRV Removal/Replacement
RWP # 991098 (Rev 1)	U-1 Cavity and Dryer Separator Pit Decontamination
RWP # 991031 (Rev 1)	Remove/Replace 1B33-F051B,A and 1B33-Fo52B,A Valves
RWP # 991033 (Rev 2)	Repair of the 1B33-F023B Valve
RWP # 991045 (Rev 1)	Disassemble and Reassemble Reactor Vessel for Refueling
RWP # 991032 (Rev 1)	Remove and Replace Control Rod Drives
RWP # 991083 (Rev 1)	SRM/IRM Drive Replacement, Drive Mechanism Maintenance and Inspection, Detector Replacement, Dry Tube Replacement
RWP # 991100 (Rev 1)	Perform In Vessel Work to Include Jet Pump, Nozzle Flush, and IVVI Activities
RWP # 991107 (Rev 1)	Rx Vessel Nozzle ISI and Support Activities

Investigation Reports and PIFs

Numerous PIFS documenting personal contamination events.

Other Documents

Summary of Unit 1 NobleChem Application, October 27, 1999
On Line Fuel Inspection At LaSalle County Nuclear Power Station Unit-1, May 1999
Radiation Protection 4th Quarter Focus Self Assessment Report (00017085-54-01)
CRPT Job Assignment Matrix, November 8, 1999
LaSalle Station Organizational Charts
Radiation Protection L1R08 Organization
Personnel Contamination Reports and Records for the Outage
L1R08 Dose Performance Data
Resume of Steven Taylor
LaSalle Station Assessment Plan, NO Assessment NOA-01-99-MS55 "L1R08 Refuel Outage Implementation"
LaSalle Station Assessment Plan, NO Assessment NOA-01-99-052 "Radiation Protection Outage Readiness"