U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-315/94006(DRSS); 50-316/94006(DRSS)

Docket Nos. 50-315; 50-316 License Nos. DPR-58; DPR-74

Licensee: Indiana Michigan Power Company
1 Riverside Plaza
Columbus, OH 43216

Facility Name: D. C. Cook Nuclear Plant, Units 1 and 2

Inspection At: D. C. Cook Site, Bridgman, Michigan

Inspection Conducted: March 28 through April 1, 1994

Inspector: C. R. Cox 4/21/94 Date

Approved By: John A. Grobe, Acting Chief, Reactor Support Programs Branch 4/29/94 Date

Inspection Summary

Inspection on March 28 through April 1, 1994 (Report Nos. 50-315/94006(DRSS) and 50-316/94006(DRSS))

Areas Inspected: Routine inspection of licensee's radiation protection program (IP 83750), including audits and appraisals, internal exposure, outage ALARA, and contamination control. In addition, the inspector reviewed licensee follow up to a previous violation and to previously identified inspection items.

Results: The licensee's radiation protection program was generally well conducted. Low source terms were attributed to good shutdown chemistry control and decontamination of hot spots. Overall station cleanliness was excellent but problems in cleaning up after jobs were noted in containment. A strength was noted in the quality of the radiation protection and chemistry Quality Assurance audit team. Some problems were noted in ALARA planning reflected by exceeding the ALARA dose goals for the outage. One violation of NRC requirements was identified as a result of a resin spill and associated personnel contaminations.

DETAILS

1. Persons Contacted

*B. Auer, Site Quality Assurance Auditor
*W. Burgess, Superintendent Scheduling
*J. Fryer, General Supervisor Radioactive Material Control
*L. Gibson, Assistant Plant Manager
*J. Lyon, Secretary, Radiation Protection
*D. Morey, Superintendent Chemistry
*D. Noble, Superintendent Radiation Protection
*H. Springer, ALARA Supervisor
*R. West, Licensing Coordinator
*J. S. Wieble, Superintendent Quality Assurance and Control

*J. Isom, Senior Resident Inspector

The inspector also interviewed other licensee personnel in various departments in the course of the inspection.

*Present at the Exit Meeting on April 1, 1994

2. Licensee Action on Previous Inspection Findings (IP 92701)

(Closed) Inspection Followup Item (IFI) (315/92017-01; 316/92017-01): Radiological liquid release from condensed airborne releases via the Unit 1 blowdown startup flash tank which discharged through the storm sewer system to Lake Michigan. A plant modification package was approved and the modification has been scheduled for June 1994. This item is closed.

(Closed) Notice of Violation (NOV) (315/93010-01; 316/93010-01): Exceeding 0.5 millirem per hour dose rate limits of Department of Transportation (DOT) requirements during the shipment of an empty package. The vendor receiving the package decontaminated the package. Procedure Number 12 THP 6010 RPP.800 "Preparation of Radioactive Shipments" was revised to require independent surveys, use of an optimal instrument for the surveys, and incorporated a checklist to ensure the DOT limits for radiation and contamination would not be exceeded. Training on the revised procedure was completed in 1993. The corrective actions appear adequate. This violation is closed.

(Closed) Notice of Violation (NOV) (315/93010-02; 316/93010-02): Failure to ensure surface doses rates limits of 0.5 millirem per hour were not exceeded on an empty shipment to Quadrex Recycling Center. Procedure Number 12 THP 6010 RPP.800 "Preparation of Radioactive Shipments" was revised to require independent surveys, use of an optimal instrument for the surveys, and incorporated a checklist to ensure the DOT limits for radiation and contamination would not be exceeded. Training on the revised procedure was completed in 1993. The corrective actions appear adequate. This violation is closed.

3. Recent Spent Resin Spill Event

On Saturday, March 19, 1994, contaminated spent resin was spilled in the 587 Drumming room during the transfer of spent resin from the Chemical and Volume Control System (CVCS) mixed bed demineralizer to the Spent Resin Storage Tank. The spill was the result of some spent resin being inadvertently diverted to and overfilling a High Integrity Container (HIC) in the Drumming room. As the resin dried out on the floor of the Drumming room, the ventilation in the room spread the contaminated resin into several areas of the Auxiliary Building causing 20 personnel to receive foot contaminations. Radiation Protection (RP) personnel were alerted to the problem when the contaminated personnel alarmed the personnel contamination monitors (PCMs) upon trying to exit the Radiologically Controlled Area (RCA). RP personnel quickly responded by securing access to the Auxiliary Building, locating the source and extent of the contamination, and decontaminating the affected personnel and affected areas of the Auxiliary Building. Full decontamination of the Drumming room was completed several days later. Whole body counts conducted on the affected personnel on March 21 through March 22, 1994, indicated there may have been four uptakes of the contamination. Those four uptakes indicated approximately 0.1 per cent of the annual limit for intake (ALI) with the maximum committed effective dose equivalent (CEDE) of 3 millirem.

While the radiological significance of the contaminations appears minor, the events that lead to the inadvertent diversion of the spent resin to the HIC raised some concerns. On Friday, March 18, 1994, the Radioactive Waste Handling Supervisor (RWHS) tried to conduct a sluicing of a new liquid radwaste processing system using a procedure (12 THP 6010 RPP.606 "Operation of the Radioactive Waste Water Demineralization System (RWDS)") recently revised to conduct the evolution. The valve lineup in the procedure proved to be inadequate to conduct the evolution and in the process of troubleshooting the valve lineup, two valves were left open which led to the diversion of the resin on the following day. An Auxiliary Operator (AO) used Procedure 02 OHP 4021.007.002 "Reactor Coolant Demineralizer Resin Sluicing and Replacement" for the resin transfer on March 19, 1994. That procedure failed to direct the AO to verify the position of the two valves that were left open from the previous day which provided the alternative flow path. Also during the resin transfer evolution, the AO did note flow noises from a valve that should have been closed so he shut that valve. Both the RWHS and the AO had indications that their procedures were inadequate due to no flow on the first day and flow through the valve on the next. However, the sluicing operation attempt continued as did the resin transfer. Both procedure inadequacies are considered a violation of 10 Code of Federal Regulations (CFR) Part 50 Appendix B Criterion V (315-94006-01/316-94006-01).

4. Audits and Appraisals (IP 83750)

The Quality Assurance (QA) department was recently reorganized to strengthen the licensee's overall self-assessment capabilities. The

reorganization resulted in a new Superintendent of Quality Assurance and Control. No major effect from the reorganization was noted on an already strong chemistry and radiation protection QA audit team which consisted of four auditors. Team members had health physics or chemistry experience.

Several chemistry and radiation protection surveillances were completed during the outage. One major finding in chemistry identified a continuing negative trend in the Chemistry Department performance. A condition report was written acknowledging that corrective actions to previous problems in procedural compliance and document control were ineffective which resulted in the negative trend. A new chemistry manager was brought in to address the negative trend. Issues identified in radiation protection during an ongoing work in progress audit included not meeting the ALARA goals, reviewing the personnel contamination incidents (PCIs) to determine the effect of reduced respirator use, and reviewing the effectiveness of early boration during the shutdown and chemistry decontamination of the regenerative heat exchanger and the resistance temperature detector (RTD) loops for source term reduction. The conclusions from the work in progress surveillance report will be reviewed during the next inspection.

No violations or deviations were identified.

5. Control of Radioactive Materials and Contamination, Surveys and Monitoring (IP 83750)

Tours of the plant and selected work areas did not identify any problems in the implementation of the licensee's contamination control program. Overall, work areas were well maintained and the cleanliness of the station was noteworthy. An exception to the overall high standard of cleanliness at the facility was in containment. Tie wraps and other debris left over from completed jobs were noted accumulating in containment. The licensee planned to clean up any debris left over from completed work towards the end of the outage. While no foreign material exclusion problems were noted, the accumulation of the debris increased the potential for such problems to arise. Also, potentially higher doses could be received from cleaning up at the end of the outage rather than having workers clean up their work site on an ongoing basis.

Through March 29, 1994, there were 205 PCIs, most of which were identified during the refueling outage. While that number was high, higher numbers were expected due to the reduced respirator use. Of the 205 PCIs, 60 were attributed to the new 10 CFR Part 20 evaluated conditions, 75 due to personnel error, and 107 to facial contaminations. The high number of facial contaminations is similar to what other facilities have been experiencing with reduced respirator use. The licensee was re-evaluating the method used to determine reportable contaminations. Using a threshold value of total effective dose equivalent (TEDE) appeared to be the approach they were planning to use. Any PCI not resulting in a dose exceeding the threshold TEDE would still be evaluated and recorded to trend the data, but would it would not be

considered reportable. The methodology and procedures implementing the new system will be reviewed in a future inspection.

No violations or deviations were identified.

6. Maintaining Occupational Exposures ALARA (IP 83750)

There have been no major changes in the overall station ALARA management program since the previous inspection. The inspector reviewed ALARA program performance and initiatives implemented during the on-going refueling outage. Six weeks into the outage had resulted in 195 person-rem verses an ALARA goal of 135 person-rem, approximately 140 per cent off the goal for the sixth week of the outage. A major contributor to the high dose appeared to be the hydro-lazing work causing all four steam generators to be drained at the same time and for a longer period than the ALARA planners expected. Having all four steam generators drained at the same time caused higher than planned doses for all the other activities in the general vicinity of the steam generators. The ALARA group estimated that the final outage total exposure would be 210 person-rem. That would place the total outage exposure approximately 116 percent over the total goal of 180 person-rem. Overall station dose rates indicate that the license has low source terms. Therefore, the planning problems encountered during the outage did not cause the ALARA goal to be exceeded by a significant margin. However, the licensee acknowledged that significant lessons could be learned from the outage and be used to better plan the 1994 Unit 2 outage.

Source term reduction at the facility appears effective as evident by the low dose rates encountered during the outage. Efforts included chemical cleanup of the reactor coolant system performed at shutdown using acidification of the coolant by lithium removal and boration followed by addition of hydrogen peroxide and control of reactor coolant temperature to increase solubilization of crud and removal by demineralizers. The chemical cleanup accounted for the removal of 1279 curies of cobalt-58 and 17 curies of cobalt-60 from the primary system. A chemical decontamination was also performed on the Regenerative Heat Exchanger and the Resistance Temperature Detector (RTD) loops. The decontamination appeared very effective for the heat exchanger but had mixed results with the RTD loops. The licensee initiated a more rigorous dose rate measurement of the effectiveness of the decontamination by bringing in a vendor to conduct the measurements. The new data was being analyzed to provide a baseline for future decontaminations.

No violations or deviations were identified.

7. Training and Qualification of Personnel

Contractor Radiation Protection Technician qualifications were reviewed by the inspector. The screening process for the technicians involved the contractor site representative reviewing resumes and sending the licensee a list of potential candidates with their qualifications.

Likely candidates would have their references checked. As an additional screening tool, an examination developed by another utility would be administered by the facility. Test scores would be tracked by the utility who developed the examination and technicians would be required to retake the exam every two years. The contractor, the licensee, and other licensees were participating in the program.

No violations or deviations were identified.

8. Exit Interview

The scope and findings of the inspection were reviewed with licensee representatives (Section 1) at the conclusion of the inspection on April 1, 1994. The licensee did not identify any documents as proprietary. The following specific items were discussed with the licensee during the exit meeting:

- The resin spill and the resulting violation.
- The exceeded ALARA goal and the lessons learned.
- The overall station cleanliness compared to the problems noted in containment.
- The quality of the Quality Assurance surveillances for Radiation Protection and Chemistry.