U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-315/85011(DRSS); 50-316/85011(DRSS)

Docket Nos. 50-315; 50-316 Licenses No. DPR-58; DPR-74

Licensee: American Electric Power Service Corporation
Indiana and Michigan Electric Company
1 Riverside Plaza
Columbus, Ohio 43216

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

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

Inspection Conducted: April 22, May 15-17, May 23-24, and June 19, 1985

Inspectors: for P. C. Lovendale — 7/9/85 Date

C. F. Gill — 7/9/85 Date

Approved By: L. R. Greger, Chief
Facilities Radiation Protection Section — 7/9/85 Date

Inspection Summary

Inspection on April 22, May 15-17, May 23-24, and June 19, 1985 (Reports No. 50-315/85011(DRSS); 50-316/85011(DRSS))

Areas Inspected: Routine, unannounced inspection of the radiation protection program during a refueling and maintenance outage including: changes in organization, personnel, facilities, equipment, programs, and procedures; audits and appraisals; planning and preparation; training and qualifications of new personnel; internal and external exposure control; control of radioactive materials and contamination, surveys, and monitoring; and the ALARA program. Also, certain TMI Action Plan Items, open items, radiation protection organization and staff stability, a containment airborne radioactivity incident, and an allegation by a former employee were reviewed. The inspection involved 71 inspector-hours onsite by two NRC inspectors.

Results: Three violations were identified (Failure to comply with a TMI Action Plan Confirmatory Order - Section 15, failure to post and barricade a high radiation area - Section 11, failure to perform necessary surveys - Sections 10 and 12).

DETAILS

1. Persons Contacted

#P. Barrett, Lead Compliance Engineer - AEP
*A. Blind, Assistant Plant Manager - Maintenance
#S. Brewer, Radiological Support Section Manager - AEP
*R. Clendenning, Radiation Protection Supervisor
#M. Evarts, Licensing Scientist - AEP
J. Feinstein, Manager of Nuclear Safety and Licensing - AEP
#*J. Fryer, Radiation Protection Coordinator
#M. Glissman, Performance Engineer
P. Holland, Radiation Protection Supervisor
*M. Horvath, Senior QA Auditor - AEP
#*L. Holmes, Administrative Compliance Coordinator
J. Joseph, ALARA Coordinator
#S. Klementowicz, Health Physicist - AEP
#T. Kriesel, Technical Superintendent Physical Sciences
#J. Leichner, Radiological Support Nuclear Engineer - AEP
*J. Nadeau, QA Auditor - AEP
J. Nelson, Radiation Protection Engineer
#D. Palmer, Plant Radiation Protection Supervisor
#J. Paris, Radiation Protection Technician
#R. Shoberg, I&C Section Assistant Manager - AEP
#*W. Smith, Jr., Plant Manager
*J. Stietzel, QC Supervisor
*B. Svensson, Assistant Plant Manager - Operations
*J. Wojcik, Plant Chemical Supervisor

J. Heller, NRC Resident Inspector
*B. Jorgensen, NRC Senior Resident Inspector

The inspectors also contacted other licensee and contractor employees including radiation protection technicians and members of the technical staff.

*Denotes those present at the exit meeting on May 24, 1985.

#Denotes those present at the exit meeting on June 19, 1985.

2. General

This inspection, which began at 12:00 noon on April 22, 1985, was conducted to review the radiation protection program during a refueling and maintenance outage, including changes in organization and management controls, qualifications and training, audits and appraisals, planning and preparation, internal and external exposure controls, ALARA program, and control of radioactive material and contamination. The inspectors conducted radiation and contamination surveys of selected plant areas using NRC survey instruments (Xetex 305-B and Ludlum); except as noted in Section 11, readings were in general agreement with posted licensee data. Problems noted with area postings, surveys, and radioactive material storage are discussed in Section 12. Access controls were good. Housekeeping and storage of radioactive materials need improvement.

3. Licensee Actions on Previous Inspection Findings

(Closed) Open Item (315/84-17-02; 316/84-19-02): Need for guidance relating removable contamination levels to respiratory protection equipment use. The needed guidance has been provided to the technicians. No other problems were noted.

(Closed) Open Item (315/85006-01; 316/85006-01): Use of Hydro Nuclear dry active waste (DAW) segregation and volume reduction system. After receiving concurrence from the Office of Inspection and Enforcement, Region III notified the licensee that the use of this equipment was acceptable to the NRC providing it is operated in accordance with the manufacturer's instructions and that all detected radioactive waste is disposed of properly.

4. Changes

The inspectors reviewed changes in organization, personnel, facilities, equipment, programs, and procedures that could affect the outage radiation protection program.

A Radiation Protection Supervisor has been appointed as Outage Coordinator for the radiation protection group. He ensures that sufficient health physics coverage is available for planned work. In addition, plant senior radiation protection technicians that have received temporary upgrades to supervisory positions have been assigned to each shift as the plant representative at Containment Access Control (CAC). This individual ensures contracted technician adherence to plant radiation protection procedures.

These changes appear to benefit the licensee's outage radiation protection program by providing the needed radiation protection coverage on all shifts and oversight of contractor activities.

No violations or deviations were identified.

5. Radiation Protection Manager (RPM)

The inspectors reviewed the Radiation Protection Manager's (RPM) position within the plant organization. The Plant Radiation Protection Supervisor is designated as the RPM as stated in Technical Specification 6.3. The review revealed that the current Plant Radiation Protection Supervisor has been removed from radiation protection management chain which appears to be contrary to Technical Specification Table 6.2-2. In addition, two new positions have been added between the Plant Manager and the Plant Radiation Protection Supervisor. The Plant Radiation Protection Supervisor now reports to the Radiation Protection Coordinator (new position). The Radiation Protection Coordinator reports to the Physical Science Technical Superintendent who reports to the Assistant Plant Manager - Maintenance (new position) who reports to the Plant Manager. The two new positions are not indicated in Technical Specification Table 6.2-2 and appear to dilute the RPM's access to the Plant Manager for radiation protection

matters. Removal of the RPM from the radiation protection management chain and addition of two additional managers (one of which is responsible for maintenance activities) between the RPM and the Plant Manager is considered an unresolved item pending review by NRC Headquarters. (315/85011-01; 316/85011-01)

The inspectors noted that the person currently filling the Radiation Protection Coordinator position and a radiation protection supervisor recently hired from the Palisades Plant both appear to meet the RPM qualifications as outlined in Regulatory Guide 1.8.

One unresolved item was identified; no violations or deviations were identified.

6. Audits and Appraisals

The inspector reviewed reports of audits and appraisals conducted for or by the licensee including audits required by technical specifications. Also reviewed were management techniques used to implement the audit program, and experience concerning identification and correction of programmatic weaknesses.

No violations or deviations were identified.

7. Radiation Protection Staff Stability

The licensee's radiation protection staff has been very stable over the last four years. Other than some career progression, no significant turnover has occurred. The technicians have an average of only about 2.5 years of plant experience, due primarily to the addition of about 15 entry level positions a little over one year ago. These positions were created to accommodate the licensee's grow-your-own technician program and to alleviate some manpower shortage problems.

Except for the contractor site supervisors during outages, contracted radiation protection managers are not utilized. Contracted radiation protection technicians are normally only used during outages and there appears that a significant number of these technicians return to the plant for each outage.

8. Planning and Preparation

The inspectors reviewed the outage planning and preparation performed by the licensee, including: additional staffing, special training, increased equipment supplies, and job related health physics considerations.

The station's radiation protection group has been augmented with 92 contracted radiation protection personnel. This includes one site coordinator, three shift supervisors, 53 senior technicians, and 35 junior technicians. The inspectors verified that those technicians not meeting ANSI N18.1-1971 selection criteria were not providing radiation protection duties without proper supervision.

Whole body counting, respirator fitting, respirator filter recertification, laundry operation, tool and certain floor decontamination, and some solid waste handling is being performed by contractors to help minimize the effect of the outage on the plant staff.

The inspectors observed that an adequate supply of portable survey instruments and portable ventilation equipment was available for use during the outage. The licensee plans to rent about 10 portable survey instruments from a vendor in addition to normal station supplies. Protective clothing supplies appear adequate.

Evidence that job planning and preparation is influenced by radiation protection includes containment decontamination and shielding prior to allowing outage work to begin and radiation protection and ALARA participation in all planning and outage meetings.

No violations or deviations were identified.

9. Training and Qualifications of New Personnel

The inspectors reviewed the education and experience qualifications of new plant and contractor radiation protection and chemistry personnel, and training provided to them. Also, radiation protection training provided to other contractor personnel was reviewed.

Selection of contracted radiation protection technicians includes a review of the technicians' resumes by three radiation protection supervisors and by randomly calling other plants to verify previous work experience. Those selected attend 8 to 16 hours of procedure and plant specific training which is followed by an exam. In an effort to provide on-the-job training for the plant radiation protection technicians, about 14 junior technicians have been assigned to work with the contracted technicians out of the containment access control area. This should provide the technicians with valuable experience in coverage of potentially high exposure work.

Pre-outage special training provided to station and contract workers includes mock-up training for certain high exposure work. ALARA briefings for each work group, and RWP program training. No problems were noted in this area.

No violations or deviations were identified.

10. Internal Exposure Control and Assessment

The inspectors reviewed the licensee's internal exposure control and assessment programs, including: changes to procedures affecting internal exposure control and personal exposure assessment; determination whether engineering controls, respiratory equipment, and assessment of individual intakes meet regulatory requirements; planning and preparation for maintenance and refueling tasks including ALARA considerations; and required records, reports, and notifications.

Whole body counting data, respiratory protection training records, MPC-hour determinations, and air activity surveys for January 1985 to date were selectively reviewed; no problems were noted.

The inspectors observed that appropriate air samples were being collected to support the outage work, and that air samples collected were counted promptly and received timely review.

The inspectors reviewed a Unit 1 containment airborne radioactivity incident which occurred on April 20, 1985. On this date, the licensee opened all four steam generators to prepare for eddy current testing. After the manway diaphragms were removed, temporary ventilation systems were connected to the cold leg side of each generator. The temporary ventilation systems, consisting of a blower, a HEPA filter, and a charcoal adsorber, were set up to discharge into the containment purge system. Because the air circulated through the steam generators contained high levels of moisture, the charcoal filters were removed from the portable ventilation units to prevent a reduction in flow.

Opening of the steam generators usually results in a small noble gas release. As a result of the gas releases, the vent stack noble gas monitor VRS 1505 alarmed at about 10:45 a.m., 3:10 p.m., and 4:00 p.m. In response to these alarms, as required by procedure, operators tripped the containment purge. At about 2:50 p.m. radiation protection personnel removed the charcoal filters from the portable ventilation units due to concerns over the moisture content of the circulating air and its effect on the charcoal and resultant flow reduction. When the purge was tripped the portable ventilation units no longer had a discharge pathway, which resulted in the air being blown into containment. At 3:10 p.m. when the purge was tripped, there was no longer any charcoal filters in the ventilation pathway to remove the radioactive iodine present. This resulted in a release of the iodine to the containment atmosphere. Airborne iodine concentration in the containment reached a maximum of about ten times MPC based on an air sample collected at 4:00 p.m. Twelve workers were evacuated from containment at about 5:55 p.m. The delay in the evacuation was apparently due to a delay in counting the air sample.

Six of the workers who were in the containment the longest were whole body counted. No significant intakes were identified. The maximum intake received by any worker was about 15 MPC-hrs as calculated based on available air sample results. These calculations were in agreement with the whole body counts.

A review of Procedure No. 12 MHP 5021.002.005, "Maintenance Procedure for Steam Generator Primary and Secondary Manway Removal and Secondary Side Inspection," revealed that the hookup of the portable ventilation system from the steam generator to the containment purge system and the precautions associated with removal of the charcoal filter and tripping of the containment purge system were not addressed. In addition, the consequences of removing the charcoal filters and tripping the containment purge while the portable ventilation systems were in operation

were apparently not evaluated. This appears to be a violation of 10 CFR 20.201(b), which requires that the licensee evaluate the extent of the radiation hazards that may be present. (315/85011-02; 316/85011-02)

One violation and no deviations were identified.

11. External Exposure Control

The inspectors reviewed the licensee's external exposure control and personal dosimetry programs, including: changes in the dosimetry program to meet outage needs; use of dosimetry; planning and preparation for maintenance and refueling tasks including ALARA considerations; and required records, reports, and notifications.

Exposure records of plant and contractor personnel for January 1985 to date were reviewed. No exposures greater than 10 CFR 20.101 limits were noted. Total exposure for 1984 was about 690 person-rems, which is slightly higher than the licensee's average over the preceding five years of about 640 person-rems. Total dose for 1985 to date is about 290 person-rems.

While performing independent radiation and contamination surveys in the waste gas valve gallery (Room 334) on May 23, 1985, the inspector identified a high radiation area and contamination area which was not identified on the most recent survey map dated May 22, 1985. The inspector climbed a fixed ladder located inside the valve gallery and measured about 3000 mrems/hr at contact with a small drain line from the waste gas system. The drain line was located about two feet from the ladder and the inspector measured the dose rate that would be received by a person standing on the ladder of about 170 mrems/hr. The inspector collected two smear samples directly under this area on the floor and from the top of a nearby flow control valve. The flow control valve was contaminated to about 1E+6 dpm/100 square centimeters and the floor was contaminated to about 2000 dpm/100 square centimeters.

This area was not posted, barricaded, or controlled as either a high radiation area (greater than 100 mrems/hr) or as a contamination area (greater than 500 dpm per 100 square centimeters). The inspector's survey results were in close agreement with later surveys conducted by the licensee. This matter was discussed during the exit meeting, including the need for the technicians performing routine radiation and contamination surveys to measure dose rates in accessible areas other than those at waist level and to collect smear samples on horizontal surfaces other than the floors. Other survey problems are discussed in Section 12.

Technical Specification 6.12.1.a requires that a high radiation area greater than 100 mrems/hr but less than 1000 mrems/hr be barricaded and conspicuously posted as a high radiation area. Failure to post and barricade the high radiation area near the small drain line in Room 334 is considered a violation of this technical specification requirement. (315/85011-03)

One violation and no deviations were identified.

12. Control of Radioactive Materials and Contamination

The inspectors reviewed the licensee's program for control of radioactive materials and contamination, including: adequacy of supply, maintenance, and calibration of contamination survey and monitoring equipment; effectiveness of survey methods, practices, equipment, and procedures; adequacy of review and dissemination of survey data; and effectiveness of methods of control of radioactive and contaminated materials.

The inspectors performed a radiation and contamination survey of tools, equipment, and floor areas in portions of the machine shop and turbine building. No contaminated material was found, which indicates good adherence to release procedures for tools and equipment used in controlled areas.

The licensee recently implemented a whole body personal contamination monitoring (frisking) program. The new program requires workers to perform a minimum hand and foot frisk for contamination if they entered the radiologically controlled area but did not enter any contaminated areas and a whole body frisk for those workers who entered a contamination area. In addition to required frisking, all workers exiting the controlled area must pass through a portal monitor. The inspector observed that most workers made an attempt to perform the required frisking, but that most need to improve on their frisking technique. The most common errors noted were frisking too rapidly or holding the probe too far from the surface being frisked. Implementation of this program will represent a significant improvement in the licensee's personal contamination monitoring program once the workers improve their adherence to the frisking requirements.

During this inspection, several examples of inadequate evaluations or failure to perform evaluations of radiation hazards were noted as follows:

a. During facility tours, the inspectors noted an abundance of small radioactive material storage areas within the auxiliary building which were cluttered and overflowing. The licensee apparently has no separate building for long term storage of radioactive material which necessitates the numerous small areas within the auxiliary building. One such area is located under the Unit 1 exhaust and supply ventilation units. This area was overflowing and a radiation survey indicated that material had been added to the area or moved around within the area without reevaluating the radiation area boundaries. Dose rates at the perimeter of the storage area were about 7 mrems/hr.

b. The inspectors surveyed the radioactive waste dumpster located on the 650-foot elevation of the auxiliary building. Accessible radiation levels of about 8 mrems/hr were measured around the dumpster indicating that surveys of the area had not been conducted following addition of radioactive material to the dumpster. The area was not posted as a radiation area.

c. On April 29, 1985, the licensee shipped three Eberline Teletector survey instruments to Eberline for calibration and repair. On May 8, 1985, Eberline returned the Teletectors to the licensee, with a note which indicated that the Teletectors were contaminated. Surveys conducted by the licensee revealed between 9,000 and 450,000 dpm/100 cm^2 fixed contamination and a maximum of about 700 dpm/ 100 cm^2 removable contamination. It appears that an adequate survey of the Teletectors was not conducted before they were shipped to Eberline. Because the instruments were tightly packaged in their carrying cases, no significant shipping hazard existed. Eberline discovered the contamination during a routine survey of incoming instruments.

Failure to perform adequate surveys of the storage area, the dumpster, and the Teletectors, is a violation of 10 CFR 20.201(b), which requires that the licensee perform surveys to evaluate the extent of the radiation hazards present. (315/85011-02; 316/85011-02)

One violation with three examples and no deviations were identified.

13. Maintaining Occupational Exposures ALARA

The inspectors reviewed the licensee's program for maintaining occupational exposures ALARA, including: changes in ALARA policy and procedures; ALARA considerations for maintenance and refueling outage; worker awareness and involvement in the ALARA program; establishment of goals and objectives, and effectiveness in meeting them. Also reviewed were management techniques used to implement the program and experience concerning self-identification and correction of implementation weaknesses.

The licensee does not establish annual ALARA goals for the plant or for individual work groups. ALARA goals are set for each job as they are planned. The ALARA program includes provisions for dose reduction by minimizing contaminated areas, but the extent of contaminated areas is tracked by the radiation protection group instead of the ALARA group. The amount of the controlled area that is contaminated has remained relatively constant over the last few years. Currently, about 51,000 square feet of area is controlled as contaminated.

No violations or deviations were identified.

14. IE Information Notice No. 85-06

The inspectors reviewed licensee action taken in response to IE Information Notice No. 85-06, Contamination of Breathing Air Systems. Health physics personnel were aware of the contents of this notice and stated that needed air system sampling is already conducted. No other action is planned. No problems were noted.

15. Status of Certain TMI Action Plan Items

The inspectors reviewed the status of the post-accident sampling system (II.B.3), high range noble gas effluent monitors (II.F.1.1), accident range iodine and particulate effluent sampling systems (II.F.1.2), and containment high range radiation monitors (II.F.1.3). Although these systems are installed and functional, documentation demonstrating compliance with NUREG-0737 clarification items was not readily available for review.

During the review of the noble gas effluent monitoring system for the main steam safety valves/power operated relief valve (PORV) pathway, the inspectors noted that two of the four loop monitors on each unit had been out of service since at least September 1984. The entries in the Non-Conforming Equipment Log indicate the monitors had been out of service because they were out of calibration. A licensee representative stated that technical difficulties were traced to cable noise which was corrected. The monitors were declared operational May 26, 1985.

By a Confirmatory Order, dated March 14, 1983, and a modification to the Confirmatory Order, dated December 16, 1983, the NRC ordered the licensee, in part, to implement and maintain NUREG-0737 Item II.F.1, Attachment 1, "Noble Gas Effluent Monitors," by the end of the 1983 Unit 1 refueling outage. NRC Generic Letter No. 83-37, dated November 1, 1983, was sent to all pressurized water reactor licensees. This letter contains maintenance guidance for these noble gas effluent monitors, including: (1) in case of monitor failure, appropriate action should be taken to restore it's operational capability within a reasonable period of time; (2) seven days is considered a reasonable time period to restore the operability of the monitor; (3) an alternate method for monitoring the effluent pathway should be initiated no later than 72 hours after identification of the monitor failure; and (4) if the monitor is not restored to the operable condition within seven days after failure, a special report should be submitted to the NRC within 14 days.

Contrary to the above, the steam safety/power operated relief pathway monitors were out of service for an excessive period of time without apparent good cause, no adequate alternate method of monitoring this pathway appears to have been available, and no NRC notification occurred. Failure to maintain these monitors operable is considered to be a violation of the March 14, 1983 NRC Confirmatory Order. (315/85011-04; 316/85011-03)

The noble gas effluent monitors for the main steam safety/power operated relief valve pathway are mounted downstream of the PORV on the discharge line. The acceptable location for externally mounted monitors specified by NUREG-0737 is on the main steam line upstream of the safety valves and PORV. Inspector concerns with the present locations were discussed during the exit meeting and the licensee was informed that concurrence on the acceptability of the monitor locations must be obtained by the licensee from NRR. Pending resolution of this issue by NRR, this matter is considered an unresolved item. (315/85011-05; 316/85011-04)

In addition to the violation and the unresolved item, two weaknesses related to Confirmatory Order and NUREG-0737 compliance were identified as follows:

a. It appears that the measures established to identify and correct the faulty noble gas effluent monitors were inadequate to restore the monitors to service in a timely manner.

b. No significant progress has been made by the licensee to resolve inspector concerns described in open item 315/84-17-04; 316/84-19-04 (NUREG-0737, Item II.F.1, Attachment 2) and 315/84-17-05; 316/84-19-06 (NUREG-0737, Item II.F.1, Attachment 1) since the last inspection (Inspection Reports No. 50-315/85006; 50-316/85006).

These weaknesses were discussed at the June 19, 1985 exit meeting and will be reviewed further during a future inspection. (315/85011-06; 316/85011-05)

One violation, one unresolved item, and no deviations were identified. In addition, two program weaknesses were identified.

16. Former Employee Allegation

Allegation: A former employee stated that his personal record of self-reading dosimeter totals showed that he received a cumulative exposure over his four-month employment of 100 mrems, but that the termination exposure report he received from the licensee showed he had received zero exposure during this period.

Discussion: According to the licensee's vendor supplied TLD records for this person during his four-month employment, no measurable radiation exposure was received. Self-reading dosimeter records were not available for review and are not normally retained for long periods of time. The licensee's radiation protection program has established the TLD as the official exposure monitoring device. The licensee's program also includes provisions for investigating significant differences between TLD and self-reading dosimeter totals for a given monitoring period (usually one month) should the differences exceed established criteria. The 100 mrems self-reading dosimeter totals which the alleger claims accumulated over the four months is likely due to normal instrument drift, which could total as much as 480 mrems over a four-month period for 0-200 mR self-reading dosimeters. Therefore, the difference between the former employee's self-reading dosimeter and TLD doses is not unexpected. Furthermore, the NRC allows quarterly cumulative doses which are less than 10% of the values specified in 10 CFR 20.101(a) (125 mrems whole body) to be disregarded when maintaining records of an individual's radiation dose.

Although this allegation may be factual, the variation between the two dose measuring devices is within acceptable limits. No radiation safety concerns or regulatory problems were identified.

17. Exit Meeting

The inspectors met with licensee representatives (denoted in Section 1) at the conclusion of the inspection on May 24 and June 19, 1985. The inspectors summarized the scope and findings of the inspection, including the four violations and two unresolved items. The inspectors also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection. The licensee did not identify any such documents or processes as proprietary.

The two weaknesses related to Confirming Order and NUREG-0737 compliance were discussed. To avoid inadequate licensee response to NUREG-0737 concerns during future inspections, the inspectors requested that the licensee carefully review implementation/compliance approaches, identify a compliance coordinator, and consider preparing compliance and action plan internal reports for NUREG-0737 Items II.B.3 and II.F.1, Attachments 1, 2, and 3. These reports should be internal reports made available for NRC review. They would identify each commitment associated with the four NUREG-0737 items, ascertain compliance, identify any corrective measures needed or variance requests required, identify actions needed to document compliance, and document a detailed action plan providing a tracking system for actions needed to comply with NUREG-0737 commitments and to document compliance, including specific tasks, individuals assigned to each task, and a schedule for completion of each task.