U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-331/91021(DRSS)

Docket No. 50-331

License No. DPR-49

Licensee: Iowa Electric and Power Company IE Towers P. O. Box 351 Cedar Rapids, IA 52406

Facility Name: Duane Arnold Energy Center Inspection At: Duane Arnold Site, Palo, Iowa

Inspection Conducted: December 2-6, 1991

Tłozak Inspectors: T. J. Kozak

Radiation Specialist

P. L. Louden Radiation Specialist

Approved By:

William Snell, Chief Radiological Controls Section

Date

Inspection Summary:

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Inspection on December 2-6, 1991 (Report No. 50-331/91021(DRSS)) Areas Inspected: Routine unannounced inspection of the licensee's radiation protection program, including organization and management controls (IP 83750); training and qualifications of personnel (IP 83750); audits and appraisals (IP 84750); planning and preparation (IP 83750); external exposure controls (IP 83750); internal exposure controls (IP 83750); control of radioactive materials and contamination, surveys, and monitoring (IP 83750); maintaining occupational exposure ALARA (IP 83750); and previous inspection findings. Results: The licensee's radiation protection program appears to be generally effective in controlling radiological work and in protecting the public health and safety. The licensee has made programmatic improvements in technician training, radiation protection (RP) audits, and RP's involvement in pre-outage planning and preparations. An area requiring improvement is control of liquid spills resulting in the spread of radioactive contamination.

DETAILS

Persons Contacted

1.

Licensee Staff

*D. Boone, Supervisor, Health Physics
*D. Burrell, Training Instructor, Radiation Protection
*L. Henderson, Supervisor, Radiation Protection Training
*W. Holden, Supervisor, Radiation Protection Training
*P. Louis, Foreman, Health Physics
*K. Peveler, Manager, Corporate Quality Assurrance
*K. Putnam, Supervisor, Technical Support
*D. Robinson, Technical Support Specialist
*G. Taylor, Senior Radiological Engineer
*T. Wilkerson, Manager, Radiation Protection
*D. Wilson, Plant Superintendent
*K. Young, Assistant Plant Superintendent

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*M. Parker, Senior Resident Inspector *C. Shiraki, Project Manager, Headquarters

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

*Denotes those present at the exit meeting on December 6, 1991.

2. General

This inspection was conducted to review aspects of the licensee's radiation protection program. Included in this inspection was a followup of outstanding items in the radiation protection area. The inspection included tours of radiologically controlled areas, the auxiliary building, reactor building, and radwaste facilities, observations of licensee activities, review of representative records and discussions with licensee personnel.

3. Licensee Action on Previous Inspection Findings

(Closed) Open Item (331/91008-01): NRC concerns regarding blind spiking of neutron TLDs as part of the Ticensee's QA/QC program. The inspectors reviewed the licensee's response to the open item. The licensee has established a blind spiking program with the University of Michigan. When the need arises for the use of neutron dosimetry, six TLDs will be sent to the university for spiking and will be included with the batch sent to the vendor for analysis. The inspectors determined based on the initiation of this program that the concern had been adequately resolved; therefore, this item is considered closed.

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4. Organization and Management Controls (IP 83750, 84750)

The inspectors reviewed the licensee's organization and management controls for the radiation protection program including: organizational structure, staffing, delineation of authority and management techniques used to implement the program and experience concerning selfidentification and correction of program implementation weaknesses.

There have been numerous personnel and program direction changes since the last radiation protection inspection. The previous Radiation Protection Manager (RPM) has been reassigned as Assistant Plant Superintendent. The new RPM was hired from another licensee and was previously the RPM at that site. The new RPM was formally assigned to the position in August 1991 after a short turnover period. There were five first line supervisors reporting to the RPM, including the Health Physics Supervisor, the Radioactive Waste Supervisor, the Chemistry Supervisor and two senior health physicists. The previous Health Physics Supervisor, a contractor, was still on hand and assigned other duties. The new Health Physics Supervisor was hired from the same program as the new RPM and was responsible for ALARA, dosimetry, some radiological engineering responsibilities, and three radiation technician foremen who supervised the twenty-two house radiation protection technicians. The ALARA Coordinator was assigned two ALARA Specialists, one of which was recently hired from another licensee, who were involved in outage planning tasks at the time of the inspection. The previous Dosimetry Coordinator resigned and was replaced by a new hire from another licensee. The remaining supervisors were previously supervisory staff members and were either reassigned to new areas or were still overseeing areas that they were previously responsible for. The inspectors reviewed the qualifications of staff members. No problems were noted. However, there was some concern expressed with the extent of the workload assigned to the Health Physics Supervisor. There were significant developments imminent in the ALARA area and many new changes in dosimetry which, when added to the day to day challenges in managing radiation protection technician activities, presented a very full workload. Accomplishments in these areas will be reviewed during a future inspection.

Plans were to augment the radiation protection staff by hiring eightyeight contract technicians for the March 1992 refueling outage. Preliminary indications were that approximately fifty percent of the technicians would be returnees. Qualifications of the contract technicians will be reviewed during a future inspection.

No violations or deviations were identified.

5. Training and Qualifications of Personnel (IP 83750)

The inspectors reviewed the technician apprentice program which had been recently upgraded. The apprentice program was scheduled to be a four year program consisting of eight steps. Each step was comprised of classroom instruction followed by on-the-job training (OJT) by the instructors, when applicable, and then formal qualification to perform or cover jobs by a radiation technician supervisor. Each even numbered

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step is followed by a comprehensive examination and an oral board, both of which must be successfully completed prior to starting the next step. Step five consists entirely of systems training emphasizing radiation protection concerns with various systems. The systems courses included descriptions of all major systems including transversing incore probes (TIPs) and problems associated with them. Once all eight steps are completed, the technician is qualified as a journeyman (senior technician). The technician apprentice program appears to be well organized and to be an asset to the station.

Journeyman technician training consisted of quarterly continuing training which lasted anywhere from eight hours to a week. In the past year, topics have included information on recent events, procedure changes, NRC Information Notices, and job coverage during changeouts of source range monitors, intermediate range monitors, TIPs, and control rod drives, among other things.

The licensee offered all personnel the opportunity to participate on a strictly voluntary basis in classes to prepare them for the National Registry of Radiation Protection Technicians (NRRPT) examination. All study materials and classes were provided by the licensee to personnel who volunteered. There were thirty-two participants in the classes which were offered after-hours. The examination was taken in November 1991 and results were not yet available at the time of the inspection. However, the sizable participation in this program was indicative of the apparent positive attitude in the radiation protection program to improve performance and the knowledge of the personnel in this area.

No violations or deviations were identified.

6. Audits and Appraisals (IP 83750, 84750)

The inspectors reviewed the results of Quality Assurance audits and surveillances conducted by the licensee since the last inspection. The inspectors also reviewed the extent and thoroughness of the audits and surveillances.

The inspectors reviewed changes in the licensee's Quality Assurrance (QA) department which occurred since the last inspection. The QA department has enhanced its internal audit group with an experienced radiation protection (RP) auditor. Prior RP audits were performed by selected Iowa Electric and vendor personnel. The addition of an experienced RP person should improve the effectiveness of the QA department to identify audit findings and deficiencies within the RP department. QA has also developed a surveillance group staffed with personnel familiar with radiological protection concerns. As part of the surveillance program, inspectors and audit specialists use a deficiency checkbook which includes radiological practices as one of the concern areas.

The inspectors reviewed a recently completed audit of the licensee's Radiological Environmental Monitoring Program (REMP). Significant findings and observations from the audit were reviewed by the inspectors. Overall, the audit contained substantive technical findings and corrective actions were timely. Licensee staff also indicated that the QA department initiated a program to track NRC findings for corrective action completions.

7. Planning and Preparation (IP 83750)

The inspectors reviewed changes in the licensee's outage preparation activities. Previously, the licensee had not routinely included RP or ALARA considerations in the scheduling and up-front planning of major outage tasks. The licensee increased its staff to include an ALARA Specialist whose main duties are to interface with the outage planning group to implement ALARA considerations into the planning and scheduling of jobs. Major jobs have been divided into individual projects which are assigned a project team leader and key individuals involved with the job evolutions. Project team assignments included jobs such as shielding, motor operated valves, snubbers, hydraulic control units, control rod drives, valve repacking, and balance of plant activities. Planning for each individual project will consist of an initial scheduling meeting discussing major job issues such as work scope, scheduling with other activities, and manpower. This meeting will then be followed by an initial ALARA meeting attended by the project leader, outage management personnel, ALARA, and health physics representatives. Discussions at this meeting will include a review of the planned work activities, RWP requirements for each step of the job. ALARA methods to be used for the job, and other extraneous concerns which may have developed since the initial scheduling meeting. A second project meeting and a second ALARA meeting will be subsequently held to highlight any new developments with the project. During the second ALARA meeting, the work plan will be approved and then the RWP will be written for the task. The next step will be the pre-job briefing which will be attended by the workers performing the task, supervisors, RP technicians providing the job coverage, and ALARA representatives. Plans for these discussions are to include a review of ALARA and RWP controls which will be in place for the evolution of the job. An ALARA specialist will be assigned oversight duties for jobs performed during each shift. Licensee personnel indicated that stop work authority will be granted to the ALARA specialists and RP technicians covering a specific job in the event the radiological conditions or planned work scope changes. A post job briefing will be held following the completion of the task to discuss problems encountered during the job and collect any comments from the workers/technicians involved. Information on doses and lessons learned will be incorporated into a job history database which will be used during future planned and unplanned outages. Similarly, the RWPs for routine outage jobs will be standardized and retained for future use.

At the time of the inspection, initial scheduling meetings had been completed. The licensee was conducting the initial ALARA meetings and the second project review meetings. Licensee staff indicated that the ALARA planning meetings were currently on schedule for the February 1992 outage, and stated that good cooperation existed between the various departments involved in the planning process.

No violations or deviations were identified.

8. External Exposure Control (IP 83750)

The inspectors reviewed the licensee's external exposure control and personal dosimetry program, including: changes in the program, use of dosimetry to determine whether requirements were met, and required records, reports and notifications.

There were no major changes in the personal dosimetry program. Total station dose as of November 1991 was 199.7 person-rem. The goal for the year is 255 person-rem which should be achievable. The inspectors reviewed exposure records to date. It did not appear that there were any administrative overexposures or any exposures in excess of regulatory requirements.

The inspectors reviewed the licensee's Radiological Occurrence Reports (ROR) for 1991. ROR 91-08 identified a condition in which the licensee is exceeding their Updated Final Safety Analysis Report (USAR) zone radiation limits. The inspectors verified that the zones were properly posted and that offsite doses were not significantly affected. The higher than anticipated radiation levels appear to be mainly caused by hydrogen water chemistry. The licensee indicated that they were pursuing a change to the USAR to raise the zone radiation limits. This item will be reviewed during a future inspection. (Open Item 331/91021-01(DRSS)).

No violations or deviations were identified. One open item was identified.

9. Internal Exposure Control (IP 83750)

The inspectors reviewed the licensee's internal exposure control and assessment programs, including: changes to facilities, equipment, and procedures affecting internal exposure control and personal exposure assessment; determination of whether respiratory equipment and assessment of individual intakes meet regulatory requirements; required records, reports, and notifications; effectiveness of management techniques used to implement these programs; and experience concerning self-identification and correction of program implementation weaknesses.

Through reviews of whole body count and dosimetry records, the inspectors determined that no licensee personnel received internal exposures greater than NRC limits since the last inspection. Annual calibrations and required QC checks for the two chair whole body counters were determined to be in order and performed according to procedures. The licensee has purchased a FASTSCAN standup whole body counter for routine counting. Licensee staff members indicated that the equipment may be operational for the upcoming March 1992 outage. Other planned enhancements included re-fitting one of the chair systems with a high purity germanium detector to accommodate more detailed bioassay investigations.

The inspectors reviewed the licensee's program for respiratory protection. Reviews of selected records for wearer qualifications, medical examinations, and fit testings indicated personnel using respiratory protection met required qualifications.

The licensee has purchased PORTACOUNT systems to use for respirator fit testing. These units replaced corn oil booths used in the past. A fit factor of 1,000 on the PORTACOUNTS will be required for a successful fit. The inspectors reviewed the licensee's methods and procedures for issuing, use, maintenance, repair, decontamination, and return to service of respirators; no problems were noted. Selected equipment reviewed by the inspectors appeared to be in good condition and QC checks were performed as required by procedures.

The inspectors reviewed the licensee's quarterly air quality checks for breathing air systems. All records indicated breathing air met minimum Grade D quality as described by Compressed Gas Association Commodity Specification G-7.1.

The inspectors noted that as part of the Radiation Technician continuing training program, all technicians are trained on the use of the whole body counting systems and on performing repairs to full face respirators.

No violations or deviations were identified.

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

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; effectiveness of radioactive and contaminated material controls.

The inspectors reviewed selected routine surveys for proper documentation and supervisory review. All surveys reviewed appeared to adequately characterize radiological conditions in the surveyed area and had undergone appropriate reviews. However, the inspectors noted that general area surveys had to be requested from technicians and that very few surveys were posted throughout the controlled area. The licensee indicated that they were considering posting surveys in the controlled area for informational purposes.

The inspectors reviewed results and toured the recently completed decontamination and painting project of the Torus area. Cumulative exposure for the nine month project was about 90 person-rem.

At the time of the inspection the licensee had recorded 78 Personnel Contamination Events (PCEs). Licensee staff indicated that all PCEs were evaluated and followed up with smears of the suspect area where the contamination occurred. The yearly average contaminated floor area of the power block was 14 percent as of October; however, due to the completion of the Torus decon, contaminated area at the time of the inspection was 5 percent.

During the week of October 14, 1991, three significant spills occurred contaminating several corner rooms as described in previous Inspection



Report No. 50-331/91016 (DRP). The inspectors reviewed Radiological Incident Report (RIR) 91-08 and Root Cause Evaluation Report (RCA) 91-42 which were initiated because of these events. The suggested corrective actions in the RCA report were evaluated by the Radiation Protection and Operations Departments and their responses accepted most of the suggestions. However, the Operation Department's reply did not agree with a suggested corrective action to submit engineering work requests to hardpipe all drains. A contributing cause of one of the spills was the use of plastic sleeving as a drain line. The sleeving kinked, filled with water and separated from the drain pipe to which it was connected. During tours of the auxiliary and reactor buildings, the inspectors noticed several drain lines in the form of plastic sleeving directed to floor drains. In at least two cases, the sleeving was taped to the floor drain in such a manner that it appeared that the sleeving would most likely fill with liquid and separate from the system causing a spill. During discussions with licensee personnel concerning the spills and the inspectors' concern with the method used for draining systems, the licensee indicated that, while hardpiping all drains may be unrealistic, an investigation would be conducted into alternate means for draining systems that are not hardpiped. This item and the completion of other corrective actions concerning these events will be reviewed during a future inspection (Open Item 331/91021-02(DRSS)).

No violations or deviations were identified. One open item was identified.

11. Maintaining Occupational Exposures ALARA (IP 83750):

The inspectors reviewed the licensee's program for maintaining occupational exposures ALARA, including: ALARA group staffing and qualification; changes in ALARA policy and procedures, and their implementation; ALARA considerations for maintenance and refueling outages; worker awareness and involvement in the ALARA program; establishment of goals and objectives, and effectiveness in meeting them. The inspectors also reviewed management techniques, program experience and correction of self identified program weaknesses.

As described in Section 3, two ALARA Specialists have been assigned to the ALARA Coordinator. The licensee also has recently assigned an ALARA Engineer to the Health Physics Supervisor. The ALARA group and the ALARA Engineer have been involved with planning activities for the upcoming March 1992 outage. In addition, both groups have been effectively involved with ongoing work. For example, a recent crack arrest verification system modification to enable hydrogen water chemistry interruption studies was routed through the ALARA Engineer for input which resulted in an expansion of work activities that have reduced general area exposure rates from several hundred millirem per hour to less than five millirem per hour. In anticipation of the new tubing becoming contaminated thus increasing general area exposure rates, shielding has been added to reduce rates and a valve manifold has been designed which should significantly reduce the time required to be spent in the area. As described in previous Inspection Report No. 50-331/91015 (DRP), the licensee successfully performed a feedwater tracer test which used a highly radioactive sodium nitrate tracer.

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Planning included a mock-up of the source handling evolutions and detailed coordination efforts so that all participants were aware of their responsibilities. Actual doses received were below goals. Continued ALARA planning efforts should have positive effects on the upcoming outage. Work packages for the upcoming outage were still in the initial stages of being compiled. Therefore, ALARA plans for major evolutions will be evaluated during a future inspection.

No violations or deviations were identified.

12. Exit Meeting

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The inspectors met with licensee representatives (denoted in Section 1) at the conclusion of the inspection on December 6, 1991, to discuss the scope and findings of the inspection.

During the exit interview, the inspectors discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection. Licensee representatives did not identify any such documents or processes as proprietary. The inspectors specifically discussed the following items:

Radiation levels exceeding some USAR zone limits (Section 8).

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The completion of corrective actions to prevent recurrence of spills leading to the spread of radioactive contamination (Section 10).