U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-331/84-01(DRMSP)

Docket No. 50-331 License No. DPR-49

Licensee: Iowa Electric Light 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, IA

Inspection Conducted: January 9-13, 1984

Inspectors: L. J. Hueter — 2/2/84 Date

S. Rozak — 2/2/84 Date

Approved By: L. R. Greger, Chief, Facilities Radiation Protection Section — 2/2/84 Date

Inspection Summary:

Inspection on January 9-13, 1984 (Report No. 50-331/84-01(DRMSP))
Areas Inspected: Routine, unannounced inspection of radiation protection program, including: organization and management control; qualifications and training; external exposure control and personal dosimetry; internal exposure control and assessment; ALARA; and control of radioactive materials. The inspection involved 74 inspector-hours onsite by two NRC inspectors.
Results: No items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

J. Christianson, Licensing Engineer
*R. Dye, Asistant Radiation Protection Supervisor
T. Ferrando, Operations Committee Administrator
*H. Giorgio, ALARA Coordinator
*R. Granberg, Training Representative
L. Haven, Exposure Records Coordinator
*W. Holden, Radiation Protection Instructor
W. Miller, Technical Support Supervisor
*P. Serra, Health Physics Supervisor
*R. Stigers, Radwaste Coordinator
*N. Sunderland, Dosimetry Coordinator
*G. Taylor, Chemistry Coordinator
*J. West, Site QA Engineer
J. Williams, ALARA Engineer
*K. Young, Radiation Protection Supervisor

L. Clardy, Senior Resident Inspector, NRC

The inspectors also contacted other licensee and contractor employees.

*Denotes those present at the exit meeting.

2. General

This inspection, which began about 2:30 p.m. on January 9, 1984, was conducted to examine selected aspects of the operational radiation protection program. The inspection included review of licensee records and reports, discussions with licensee personnel, and tours of the turbine building, reactor building and radwaste facility. Housekeeping appeared to be good.

3. Licensee Action on Previous Inspection Findings

(Closed) Open Item (331/83-05-01): Review of GET training to assure trainees are informed of changes in plant practices and procedures. By full implementation of Document Change Form #140b.3-1, Revision 0, and DAEC Training Verification Form #1414.1-1, Revision 0, trainees are informed on a timely basis of changes in plant practices and procedures.

(Open) Open Item (331/83-05-02): Radiation Protection Procedure RPP 5.3 permits unconditional release of materials with low levels of contamination. Revision 10 of the procedure (dated July 13, 1983) only partially corrects the problem. The release criteria specified for fixed activity appears acceptable provided the thin window G-M detector used is a "pancake" type probe or one with essentially identical detector surface area. For removable activity, the revised procedure is still unacceptable as written since it would still permit unconditional release of materials with low levels of removable contamination.

(Closed) Open Item (331/83-05-03): Radiation Protection Procedure RPP 9.1 for the bioassay program had a number of errors and omissions. Revision 5 (dated April 18, 1983) to procedure RPP 9.1 has been implemented and was observed to correct the previous errors and omissions.

4. Organization and Management Controls

Since previously reported in Inspection Report No. 50-331/83-05, there have been no significant changes in the organizational structure or staffing of the radiation protection, chemistry, radwaste and environmental groups with the exception of a current vacancy in a management position. The position of Assistant Plant Superintendent-Radiation Protection and Security, previously held by Dave Wilson, was vacated in September when he accepted a corporate position in emergency planning. This position, in the plant reporting chain between the Radiation Protection Supervisor and the Plant Superintendent, has remained unfilled to date; the Plant Superintendent has assumed these responsibilities temporarily.

A full-time position was recently approved to provide assistance to the ALARA Coordinator.

The licensee is beginning a program of permanently assigning laborers to the radiation protection group for decontamination duties including electropolishing, hydrolazing, and general decontamination work. The licensee has indicated plans to expand this group of laborers from one individual presently to as many as 16 by December of this year.

From discusssions with management personnel and review of the program, it is concluded that the Radiation Protection Supervisor has adequate management support and authority to provide effective control of radiation, radioactive material, plant chemistry and environmental considerations.

5. Qualifications and Training

As noted in the previous section, there have been no significant changes in staffing. Two new technicians have been added to the staff. Qualifications of the staff of the radiation protection and chemistry groups was reviewed in detail in Inspection Report No. 50-331/83-05. The new technicians are working under supervision and are involved in the training/certification program described below for chemistry and health physics personnel.

An inspector attended the annual General Employee Training (GET) program, a requalification training program that lasted about a half day. The training covered items required by 10 CFR 19.12, plant specific information, and highlighted the material covered in the more detailed initial training provided new employees and biennial training provided permanent employees. The training was followed by a 50-question test. The material was comprehensive and well presented by the instructor.

The licensee initiated a new training program in June 1983 for chemistry and health physics personnel up through the foreman level. This training

is currently only provided for Iowa Electric employees although it may be expanded to include contractor employees in the future. Training is provided in one of four areas - health physics, chemistry, environmental monitoring, and radwaste - based on the trainee's area of specialization. The four areas have a common core which can be completed in about 12 weeks. Three of the four areas are divided into 8 steps (3 steps for environmental monitoring) and the steps are divided into a number of modules dealing with specific topics. The trainee must demonstrate proficiency by passing written and oral exams with a score of at least 70% and by demonstrating a working knowledge of equipment and procedures to the satisfaction of designated evaluators. The initial training program, which involves about 30 weeks of training, began in June and is well under way. It is being expedited in hopes of completing most of it before the next refueling outage, scheduled for late 1984, considering that most of the trainees are technicians with several years of experience. It is anticipated that future courses for new trainees will be spread out over about four years in conjunction with supervised work and hands-on experience. A requalification training program for technicians is currently under development.

The inspector examined training records for selected personnel and found no problems.

6. Audits

The inspectors examined licensee audits in the areas of chemistry, radiation protection, and the ALARA program. No audits had been conducted of the chemistry and radiation protection programs since the last inspections in these areas. A radiation protection audit was scheduled to be conducted approximately two weeks after this inspection.

The ALARA program was audited in June 1983 (Audit Report I-83-14). Seven findings and eight observations were generated. The initial responses to some of the audit findings were issued on August 4, 1983, and the response due date for the remaining findings was extended until April 1, 1984. The majority of the audit findings concern failure to follow ALARA program procedures. The ALARA program, being relatively new, had undergone several changes since its initiation about a year ago and in several instances the procedures no longer reflected current practices. The ALARA procedures are currently undergoing revision and are to be incorporated into new health physics procedures to be issued in early 1984. The licensee appears to be adequately addressing audit findings.

7. ALARA

As noted in previous sections, the formal ALARA program was implemented about a year ago and has undergone several changes since implementation in the interest of improving its effectiveness. Also, as noted in a previous section, the licensee has just approved a new full-time position for a person to assist the ALARA coordinator. The amount of effort devoted to a work task is dependent on the estimated dose to perform a job task. A semi-annual report provides to management a summary of accomplishments and future goals.

The more significant accomplishments to date include the installation of a removable pool seal between the dryer separator pool and the reactor cavity to permit submergence of the dryer separator while the cavity and vessel were drained. It is expected to reduce the dose rate by one third (or save about six person rems during a refueling outage) on the refueling floor during cavity and vessel entry. It should also eliminate potential for airborne contamination resulting from air drying of the separator and dryer. A flush table for cleaning control rod drive assemblies before beginning repair work is estimated to save about 9 person-rems per year. During the next refueling outage, the licensee plans to hydrolaze all remaining RHR suction lines as radiation levels around certain valves reduced from about 80 mR/hr down to about 25 mR/hr following hydrolazing of some RHR suction lines during the last refueling outage.

8. External Exposure

For external exposure evaluations, the licensee uses for official record purposes a Teledyne TLD system. The TLD is calcium sulfate with dysprosium in a teflon matrix. Each TLD has eight exposure areas for evaluating beta-gamma exposure. During the initial readout, some of the areas are not annealed and serve as a backup in the event they may be needed for verification. For QC purposes twelve of the Teledyne TLD badges are purposely spiked with differing amounts of radiation on a monthly basis and mixed in with other badges sent to the vendor for analysis. Agreement has generally been within 10 percent for these badges.

In addition to the vendor TLD, the licensee uses their own TLD and self-reading dosimeters (SRDs). Daily readings from the SRDs are fed into a computer system to provide current accumulated exposures. When the vendor's monthly TLD data becomes available it is used to replace the corresponding accumulation of SRD data. The licensee's own TLD is used for intercomparisons and also to provide prompt data if needed in such cases as when an SRD goes off-scale or when a worker may be approaching an exposure limit. For QC purposes, the SRDs are subjected to a drift check each week.

A concerted QC effort in dosimetry in the past year has minimized anomalies and resulted in general agreement between systems to within 10-15 percent.

No drywell entries during power operation (even low-level power) have been made during recent years. Neutron exposures are limited to two controlled areas near the drywell where some streaming occurs from drywell entrances (equipment hatch and personnel entranceway). Neutron exposure from entry into these areas is calculated based on measured neutron dose rates and stay times. Only a few people are involved in any one month and the maximum monthly exposure for any individual is about 25 mrem. These exposures are accounted for in the official individual exposure records.

Although the final official records were not yet available, the total person rems for 1983 reached a new high of about 1300 (person-rems). Most of this dose was received during a refueling and maintenance outage during the first half of 1983. About 670 person-rems of the outage dose was attributable to mandated modifications including torus modifications such as hangers and supports.

The inspectors reviewed the exposure records of several hundred licensee employees for 1983. None were observed to have received greater than 3 rem for calendar year 1983. During the period of the outage, a number of workers received greater than 1250 mrem for a calendar quarter. Some of these workers' records were selectively reviewed for presence of a completed NRC-Form 4 (authorizing the individual to receive up to three rem per quarter) and an internal authorization to exceed an administrative limit of 1000 mrem per quarter and authorize receipt up to 2000 mrem for the quarter. Properly completed and signed forms and authorizations were found for all randomly selected personnel. The inspectors noted that the Health Physics Supervisor had delegated in writing to the Exposure Records Coordinator the authority to increase workers' quarterly limits up to 2000 mrem. The concern over this person's qualifications to adequately evaluate ALARA matters before authorizing increased limits was discussed at the exit. This matter will be reviewed further during a future inspection. (331/84-01-01)

9. Internal Exposure

The licensee's program for controlling internal exposure includes use of engineering controls, surface and airborne survey data, respiratory equipment and direct surveillance of selected work activities. The licensee utilizes an installed whole body counter and, in addition, a commercial whole body counter during outages, to count personnel in order to evaluate the effectiveness of measures used to minimize internal exposures. The inspectors selectively reviewed whole body counts conducted in 1983. Although some trace levels of activity were detected during the period of the refueling outage, none of the counts reviewed indicated that the 40-hour control measure was exceeded.

The licensee appears to have adequate supplies of NIOSH approved respiratory equipment. The licensee plans to have a new storage and issuing area for respiratory equipment before the next refueling outage.

The licensee has a monthly inspection program for SCBA breathing devices. Other equipment is inspected when it is cleaned. A contractor using hot water and a resin purification column in a mobile trailer is utilized for mask cleaning during outages. At other times, cleaning is done by hand washing, near access control.

A review of records of randomly selected respirator users showed that all had been trained, fit tested, and medically evaluated on a timely basis before use of the equipment.

10. Control of Radioactive Materials

The licensee conducts a routine survey program consisting of both direct radiation levels and removable contamination levels. The frequency of surveys varies from daily in some high traffic areas to weekly in less traveled areas. The weekly surveys are staggered during the week to even out the work load. Five continuous air monitors (CAMs) with fixed particulate filters are located in various air flow path areas of the

plant to provide indication of changing airborne activity conditions. In addition, twelve low volume air samplers run continuously in various areas of the plant for evaluating general airborne activity levels. In addition to the routine surveys, special surveys are conducted for direct radiation, contamination, and airborne activity to evaluate conditions for work conducted under radiation work permits (RWPs). Selected survey data was reviewed for the last half of 1983 and early January 1984. No problems were identified with survey data reviewed.

The inspectors, performing an independent survey with a Xetex 305B survey meter while on a plant tour on January 13th, identified a radiation level at head height of about 13 mR per hour a few feet in front of the sample panel in the radwaste sample room. The area was properly posted as a radiation area. The reading at waist level where routine survey data is normally taken, was about 6 mR per hour. A review of routine survey data showed levels of 4-5 mR/hr had on occasion been measured at this approximate location. A licensee representative obtained an extendable probe survey meter and confirmed the readings and confirmed the source to be an overhead pipe located about 3-4 feet above head level, reading up to 80 mR/hr at contact. The licensee posted the pipe area as a "hot spot". The licensee was not aware of the magnitude of the radiation level. This matter was discussed at the exit.

Items are required to be surveyed by radiation protection technicians before removal from the controlled area and from the protected area. The positive identification of removable or fixed activity is used as the criteria for prohibiting the removal of items. Security personnel acknowledge by initialing a release form Log that the required surveys have been performed. This log is audited routinely by radiation protection supervisory personnel. The inspectors reviewed logs for items released during the last half of 1983; no problems were identified. As noted in Section 3 of this report an open item exists concerning the release limits contained in Radiation Protection Procedure RPP5.3.

11. Exit Meeting

The inspectors met with licensee representatives (denoted in Section 1) at the conclusion of the inspection on January 13, 1984. The inspectors summarized the scope and findings of the inspection. In response to certain items discussed by the inspectors, the licensee:

a. Acknowledged the inspectors' concern over the qualifications of the Exposure Records Coordinator to adequately evaluate ALARA matters before authorizing increased quarterly exposure limits and stated that the matter would be reviewed. (Section 8)

b. Acknowledged the inspectors' concern that the routine survey program did not identify a significant hot spot and stated that their routine survey program would be re-evaluated for areas with piping and potential for changing conditions and creation of hot spots. (Section 10)