U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-331/86003(DRSS)

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 21-24, 1986

Inspectors: J. P. Patterson
Lead Inspector — Date: 2/12/86

N. R. Williamsen — Date: 2/12/86

M. Smith — Date: 2/12/86

Approved By: M. P. Phillips, Chief
Emergency Preparedness Section — Date: 2/12/86

Inspection Summary

Inspection on January 21-24, 1986 (Report No. 50-331/86003(DRSS))
Areas Inspected: Routine unannounced inspection of the following areas of the emergency preparedness program: licensee actions on previously-identified items related to emergency preparedness; activation of the emergency plan; changes to the emergency preparedness program; knowledge and performance of duties (training); emergency detection and classification; protective action decisionmaking; notifications and communications; shift staffing and augmentation; licensee audits; and maintenance of the emergency preparedness program. The inspection involved 121 inspector-hours onsite by three NRC inspectors and one consultant.
Results: No violations, deficiencies, or deviations were identified as a result of this inspection.

DETAILS

1. Persons Contacted

*D. Mineck, Plant Superintendent
*R. Hannen, Assistant Plant Superintendent, Operations
*K. Young, Assistant Plant Superintendent, Radiation Protection/Security
*W. Miller, Assistant Plant Superintendent, Technical Support
*J. Smith, Technical Support Supervisor
*C. Mick, Operations Supervisor
*H. Giorgio, Radiation Protection Supervisor
*J. Christensen, Lead Shift Technical Adviser
*D. Wilson, Manager, Nuclear Licensing and Emergency Preparedness (Corporate)
*D. Hingtgen, Emergency Planning Coordinator (Corporate)
*G. Harper, Emergency Planner (Corporate)
*B. Schenkelberg, Quality Assurance Engineer (Corporate)
*G. Van Middlesworth, Training Supervisor, Training Department
J. Van Sickle, Operations Shift Supervisor
D. Fowler, Operations Shift Supervisor
G. Statton, Operations Shift Supervisor
D. Johnson, Operations Shift Supervisor
N. Brown, Operations Shift Supervisor
D. Mankin, Operations Shift Supervisor
D. Barton, Operations Shift Supervisor
R. Anderson, Operations Shift Supervisor
M. Davis, Shift Technical Assistant
S. Winter, Shift Technical Assistant
T. Enger, Shift Technical Assistant
M. Wood, Shift Technical Assistant
H. Hannon, Alternate Emergency Coordinator
E. Parsons, Alternate Site Radiation Protection Coordinator
P. Serra, Alternate Site Radiation Protection Coordinator
R. Schlesinger, Operations Training Instructor
C. Armstrong, ALARA Coordinator
R. Wildenborg, Radiological Engineer
K. Konzem, Health Physics Technician Foreman
M. Nickelson, Shift Health Physics Technician
R. McGaughy, Manager, Nuclear Division (Corporate)
R. Lessly, Manager, Nuclear Division (Corporate)
P. Swafford, Acting Health Physics Supervisor
R. Tucker, Staff Instruction Technologist, Training Department
R. Essig, Supervising Quality Assurance Department (Corporate)
H. Reif, Emergency Preparedness Instructor, Training Department
M. Craver, Emergency Preparedness Instructor, Training Department

*Denotes those attending the exit interview.

2. Licensee Actions on Previously-Identified Items Related to Emergency Preparedness

(Closed) Open Item No. 331/84005-04: This item concerned procedural discrepancies related to the frequency of communications checks and the objectives of the semi-annual Health Physics drills. Changes have been incorporated into EPIP 6.1 and Corporate Implementing Procedure (CIP) 4.2. Also, Section N.2.2 of the DAEC Emergency Plan and CIP 4.2 both include statements that the Post Accident Sampling System (PASS) shall be included in one of the semi-annual Health Physics drills. This item is considered closed.

3. Activation of the DAEC Emergency Plan

(Closed) Open Items No. 331/850XX-01, -02, -03, -04, -05, -06; 331/860XX-01, -02. The inspectors reviewed licensee records of nine Notifications of Unusual Event (NUE) declarations. One occurred on July 23, 1985 due to a Reactor Core Isolation Cooling (RCIC) steam driven pump tripping on overspeed. This item was determined not to be an NUE after review of the Shift Supervisor's Log and the EAL tables in EPIP 1.1.

The remaining NUEs were determined to be properly classified based on the appropriate EALs. Notifications to offsite authorities and the NRC were made within the required time frames. Random checks of some events were made with a Linn County official and the Director of the Iowa Office of Disaster Services to validate the notification times claimed by the licensee. There were no discrepancies identified. All notifications met the requirement of 10 CFR 50, Appendix E, Section IV, D.3.

4. Emergency Detection and Classification (82201)

The inspectors conducted walkthroughs with initial Emergency Coordinators to determine their capabilities to utilize the appropriate EALs, to classify an emergency event, to initiate notifications, and to perform other emergency-related functions such as protective action recommendations (PARs) and an initial dose assessment. Four teams of three individuals were involved in these walk-throughs. Each team consisted of two Operations Shift Supervisors (OSS), and a Shift Technical Advisor (STA). EPIP 1.1, Attachments 1 and 2, Revision 6, was used by the four teams. When scenario conditions indicated a loss of fuel integrity and a design basis loss of coolant accident (LOCA) along with an indication of potential loss of containment, two of the teams correctly classified the conditions as a General Emergency. The other two teams improperly classified the event as a Site Area Emergency (SAE).

The misclassification appeared to be due to confusion created in the text of the EAL General Emergency column which stated: "loss of two of the three following fission product barriers with potential loss of the third: a). RCS integrity - See B-1." The B-1 reference appeared to be incorrect due to the fact that B-1 is in the Alert column and stated:

"Reactor coolant system leak rate greater than 50 gpm but within makeup capacity; RPV level being maintained." However, in the scenario used by the inspectors, the leak was beyond the makeup capacity and RPV level could not be maintained. The inspector suggested that the procedure column and the event type for General Emergency be reviewed and modified to eliminate potential confusion on the part of the user.

Upon reviewing the EALs for a SAE, the inspector observed that EAL C-5 stated "Degraded core with possible loss of coolable geometry." NUREG-0654 guidance states that indicators should include instrumentation to detect inadequate cooling, coolant activity, and/or containment radioactivity levels. No such indicators were given in this EAL.

The inspector determined, through a review of documentation, that the licensee conducted an annual review of the EALs with officials from Linn County, Benton County, and the State of Iowa Office of Disaster Services on October 9, 1985.

Based on the above findings, the following is an Open Item:

- The wording of the General Emergency EAL for "loss of fission product barriers," should be clarified and the Site Area Emergency EAL for "degraded core with possible loss of coolable geometry should be expended to include indicators per the guidance in NUREG-0654, Revision 1. (Open Item No. 331/86003-01)

5. Protective Action Decisionmaking (82202)

The inspector reviewed EPIP 3.3, "Dose Assessment and Protective Action Recommendations (PARs)," Revision 1. Attachment 1 of EPIP 3.3, "Protective Action Decisionmaking," was a flowchart with various plant conditions which "trigger" PARs. The flowchart had an incorrect value in one section of the chart which specified field readings. Presently these readings are listed as "> 1 rem/hr at Site Boundary" or "> 300 rem/hr at the two mile radius." Discussion with the Radiation Protection Supervisor confirmed that this "> 300 rem/hr" was incorrect.

At the exit interview the Manager, Nuclear Licensing and Emergency Planning, stated that he would send the NRC Lead Inspector a draft copy of a revised PAR flow chart as Attachment 1 of EPIP 3.3 for NRC review and comment. This chart would include a correction for the field reading values previously addressed. This will be tracked as an Open Item. (331/86003-02)

The four teams interviewed (see Section 4) each demonstrated capability to utilize the Protective Action Recommendation (PAR) flow chart. In making the initial PAR, each team also properly completed Attachment 1, EPIP 1.2, Notification Form.

Dose projection calculations were part of the Control Room team walk-throughs. All four teams were provided the same data. Three of the teams used the computer based MIDAS system and demonstrated their

abilities to use this system. The fourth team chose the manual dose calculation method. The results of the manual dose projection showed an error of 10^6 to the computerized projections. The inspector concluded that the manual calculation contained a math error and additionally an incorrect form was used. The current EPIP 3.3, Page 46 of 50, lists the offgas stack concentration in Ci/cc, and it should be µCi/cc. The Manual Dose Projection Worksheet should be reviewed and corrected. This item will also be part of Open Item No. 50-331/86003-02, since both are related to EPIP 3.3.

For the final aspect of the walk-throughs, the inspector asked each team to determine the time necessary to evacuate three sectors of the ten-mile Emergency Planning Zone (EPZ). None of the teams could properly determine the evacuation time estimate. The inspector concluded that the procedure for estimating evacuation times (Appendix 3 of the Emergency Plan) was difficult to implement because the user must first determine a scenario, then determine a sector, and finally determine a route before an evacuation time estimate can be determined. Critical times are provided for evacuating EPZ areas as 0-2 miles. The inspector doubted that evacuation time estimates could be determined in a timely manner during a rapidly developing situation. The licensee should re-examine the criteria in these tables and guidelines in Appendix 3 to the DAEC Emergency Plan and consider formatting the evacuation times estimate into a more "user friendly" table.

Also, several tables in this appendix refer to 22-1/2 degree sectors by numbers, 1 through 16, and refer to evacuation routes by letter. Typically, those sectors are identified by letter designation A through R and evacuation routes by another method. The present designations in Appendix 3 could lead to some confusion when communicating with local and State governmental agencies.

6. Notifications and Communications (82203)

The inspectors reviewed notification procedures for corporate and site implementation, inspected equipment and supplies, and interviewed personnel regarding notifications and communications. The notification procedures are adequate and the initial content of messages to offsite authorities, as dictated by the notification form (Attachment 1 of EPIP 1.2) is sufficient.

The prompt notification system (PNS) of sirens was in place and maintained by an outside contractor whose services include quarterly inspection and repair. The PNS has been tested monthly as part of the Civil Defense siren testing on the first Wednesday of each month.

The communications links between the DAEC site and the EOF included a microwave link, the NRC Red Phone, the licensee's separate "red phone" link (between the Control Room, Technical Support Center, Emergency Operations Facility, and the Linn County Emergency Operations Center), commercial telephone, and two-way radio. The EOF in Cedar Rapids at the

IE Towers received power from one of two independent electrical substations. In addition, their backup power was available from a diesel-generator at the IE Towers. This emergency power backup included the I.E. Control Center on the 5th floor of the Towers. The Control Center also had the licensee's red phone link plus microwave, commercial telephone, and two-way radio. The microwave link and the commercial phone link were in daily use. The other links have been tested on a regular basis, as verified by the inspector's review of test records.

Key personnel carry pagers which will receive a voice message via radio page. Personnel who plan to leave the radio-page reception zone were required to turn the pager over to one of their alternates in the emergency response organization. The radio-page was considered to be only a backup to the telephone notification. Normally, these pagers would be activated by "group page" from the Control Room. In addition, the Emergency Telephone Book (ETB) listed the individual pager numbers for these same key personnel so that any individual with a pager could be directly paged if necessary.

Corporate procedure CPIP 1.2, Revision 3, Section 4.6.1 stated that the NRC shall be notified of an emergency within 1 hour of its declaration, as prescribed in 10 CFR 50.72. This should be revised to coincide with the current 10 CFR 50.72 statement - ". . . immediately after notification of the State and local authorities and within one hour of its declaration."

The annual independent audit by the QA Department verified that the call-out lists in the ETB were updated quarterly. Also, every ETB inspected was found to have the current call-out lists (dated December 31, 1985). However, four ETBs, including the book in the Control Room, had sections labeled "Corporate Personnel" and "DAEC Personnel" that were dated 1984. These should be removed. Furthermore, of four copies of Corporate Procedures (CPIPs) that were inspected, two of them contained eighteen (18) pages of call-out lists dated April 1982 in Section 1.2 and in the DAEC procedures (EPIPs) Controlled Copy No. 32 had a notification list with an effective date of March 1, 1983 and a cancellation date of June 1, 1983. These outdated lists should also be removed.

The inspectors verified through interviews of two emergency response personnel that they would actually use the current call-out list in the ETB and none of the other out-of-date lists. Also, Attachment 4, "Emergency Response Organization Notification Path", CPIP 1.2, Page 12, Revision 3, included a schematic which is somewhat confusing in that it implied that the Event Historian is the first one called out by the Emergency Response and Recovery Director. There was also no direct line from the ER&RD to his support managers.

Based on the above findings, the following is an Open Item:

- All outdated emergency telephone call lists should be removed from CPIP 1.2 to avoid confusion by potential users.

- Section 4.6.1 of CPIP 1.2, Revision 3, should be revised to agree with the current statement in 10 CFR 50.72, which requires the NRC to be notified immediately after notifying the State and local authorities but within one hour of the emergency declaration.

These two items will be tracked for corrective actions as Open Item No. 331/86003-03.

7. Changes To The Emergency Preparedness Program (82204)

Revision 5 of the DAEC Emergency Plan dated November 1984 was given final approval by corporate level management on December 19, 1984. The inspector concluded from an interview with an Emergency Planner that a 1985 plan review was performed, but formal documentation of this annual review was not made. The inspector reviewed a rough draft which reflected changes and improvements to be incorporated in the next plan revision. This annual review of the DAEC Emergency Plan was the responsibility of the Emergency Planning Coordinator (EPC). Since it is required by the plan, the annual review should be documented to include specifics of the review. Proposed revisions are routed by the EPC for internal review using a "Record Review Form," which includes provisions for documenting those who have reviewed and approved the revisions. Revision 6 is planned for implementation and distribution by November 1986 to meet the biennial review requirement of the plan, Section P.2.4.

Changes to the Emergency Plan and EPIPs have been submitted to the NRC within 30 days of such changes as required by 10 CFR 50.54(q). The inspector reviewed a tracking system initiated by the licensee specifically to track all NRC and INPO items. The system gives various priorities to the items, assigns cognizant individuals, and assigns a due date to each item. Items are identified on the tracking system by due date and tracked separately if they remain on the system past the due date.

The emergency planning staff is in the process of being augmented. The Emergency Planning Coordinator informed the inspector that his newly-hired assistant will soon be responsible for the Corporate Emergency Response Plan and related procedures. The EPC is planning to hire another assistant in February 1986 who will be responsible for the site Emergency Plan and EPIPs and be located at the site.

The Duane Arnold Energy Center Emergency Plan brochure, issued annually, has been supplemented by a two page insert in the local telephone directory. This insert includes an EPZ map, emergency telephone numbers, evacuation routes, shelter designations, and other vital information. This telephone book with the insert was distributed in April 1985. The insert will be reviewed and revised annually by the licensee.

Based on the above findings, this portion of the licensee's program is acceptable.

8. Shift Staffing and Augmentation (82205)

To meet the minimum shift staffing objectives delineated in Table B-1 of NUREG-0654, the licensee has been maintaining nine key staff positions with 13 additional emergency support personnel available for duty within 30 minutes and an additional 14 persons within 60 minutes. The licensee conducted one successful off-hour shift augmentation drill in January 1985. A review of drill records indicated that each emergency response facility (ERF) was staffed and activated within one hour.

A shift augmentation was successfully demonstrated during the exercise in October 1985. For this and other shift augmentation drills, the Emergency Telephone Book (ETB) was utilized. Pager tests were also conducted periodically during the year; however, records of these tests were not maintained or available for review. The inspector suggested that records of pager tests should be maintained to satisfy criteria to demonstrate the ability to successfully staff ERFs.

Based on the above findings, this portion of the licensee's program is acceptable.

9. Knowledge and Performance of Duties (Training) (82206)

The inspectors determined, through interviews and discussion with Training Center (TC) supervisors and training staff, that the mechanics and matrix system for EP training have not changed significantly from what was described in the 1985 Inspection Report No. 50-331/85002. A total of about 40 hours of classroom instruction was still required for the Emergency Response Organization (ERO) positions. The TC administrators have staggered the course schedules to better accommodate the normal work schedule of employees with an ERO position. Training records of 30 individuals with ERO positions were reviewed by the inspectors. All but one of the 30 had received the training courses as required by the position. The one exception was an individual who has since been transferred to the SRO training program. This person's name will be removed from the next issues of the ERO list and the Emergency Telephone Book.

The inspectors briefly reviewed four lesson plans - Notifications, Dose Projections, Protective Actions, and Environmental Surveys/Analysis. The content and intended direction of each course emphasized the key elements of the program under that particular heading. Both instructors assured the inspector that suggestions from drill critiques, table-top drills, or other non-classroom settings, have been incorporated into the classroom training if considered important after management review, including comments from the Corporate Emergency Planning Coordinator.

In an initial response to Weakness 3 from the 1985 annual emergency preparedness exercise, the training instructors stated that EP Training Course C-18, which includes capability to obtain offsite emergency samples of soil, water, and vegetation, will be incorporated into the

Health Physics STEP Program, a career achievement, ongoing HP program. Current HP technicians will also be trained on this type of sample-taking. Completion of this sample-taking training was scheduled to be completed by April 1, 1986.

Walkthroughs and interviews were conducted with Control Room personnel. Also interviewed were one Emergency Coordinator, two Site Radiation Protection Coordinators, one OSC Supervisor, four Health Physics Technicians, and two Emergency Recovery Directors. All these individuals demonstrated adequate familiarity with the EP program and their own emergency response functions. However, one plant individual stated that his ERO position would be activated at a General Emergency, when his actual activation would be at an Alert.

Based on the above findings, this portion of the licensee's program is acceptable.

10. Licensee Audits (82210)

The licensee has performed annual independent audits of the Emergency Preparedness Program during February of each year since 1984. The 1985 audit team consisted of a team leader from the corporate level Quality Assurance (QA) staff plus an independent contractor. Neither of them had any emergency planning responsibility for the licensee. The inspector confirmed that all the areas of the program as detailed in CPIP 4.1 were addressed in the audit. Evaluation of the licensee's interface with the State and local governments included direct interviews with appropriate representatives for each of the governmental agencies. These findings of the audit report (No. 1-85-04) were mailed to these offsite agencies under separate cover letters dated March 27, 1985.

Recommendations for improvement, based on the audit findings, were entered on the Commitment Tracking System for action. According to the QA instructions for audits (No. 1116.3, Revision 2), the original documents will be retained for six years. In addition, microfilms will be made and kept indefinitely. Deficiencies and weaknesses uncovered during exercises and drills were tracked on the "Drill Critique Log" as well as on the "Work List," where the name of the cognizant person for action, as well as the due date, were also entered.

Based on the above findings, this portion of the licensee's program is acceptable.

11. Maintenance of the Emergency Preparedness Program

The inspector reviewed records of Health Physics drills, radiological monitoring drills, medical drills, communications drills, shift augmentation drills, and emergency equipment inventories. All drills were conducted in accordance with regulatory requirements and emergency plan commitments. Emergency equipment was in place, and radiation monitoring equipment was operable. These equipment checks by the inspector included

emergency lockers, Control Room kits, radiological monitoring equipment kits, and the emergency locker at the Palo school. Inventory lists in the kits indicated quarterly reviews were conducted. Battery supplies for instruments were deficient in the Palo school kit as observed by the inspector. Procedure EPIP 6.1 states that spare batteries for each instrument shall be available. However, at the Palo School kit, the radiation detectors would require about a dozen batteries and the electronic megaphone would require an additional ten batteries but only ten spare batteries were in the kit.

Based on the above findings, this portion of the licensee's program is acceptable.

12. Exit Meeting

The inspectors met with the licensee representatives (denoted in Section 1) at the conclusion of the inspection on January 24, 1986. The scope and findings of the inspection were discussed by the inspectors. The inspector discussed the content of the report to determine if the licensee was aware that any of the information was proprietary. The licensee responded that none of the information should be proprietary.