U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-331/89023(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, Iowa

Inspection Conducted: September 12-15, 1989 (Onsite)
October 12, 1989 (Telephone Discussion)

Inspector: J. E. House 10/19/89
Date

Approved By: M.C. Schumacher, Chief
Radiological Controls and
Chemistry Section 10/15/89
Date

Inspection Summary

Inspection on September 12-15, 1989 (Report No. 50-331/89023(DRSS) Areas Inspected: Routine, unannounced inspection of: (1) the chemistry program including procedures, organization and training (IP 84750); (2) plant systems water quality control programs (IP 84750); (3) quality assurance/quality control programs in the laboratory (IP 84750); and (4) open item follow up (IP 92701).
Results: The licensee's water quality control program conforms to the EPRI BWR owners Group Guidelines (OGG). Plant water quality was very good with levels of contaminants much lower than required by the OGG. The chemistry QA/QC programs appeared to be adequate and were improving. No violations or deviations were identified.

DETAILS

1. Persons Contacted

[1]R. Hannen, Plant Superintendent, IE
[1]G. Taylor, Chemistry Supervisor
[1]H. Giorgio, Radiation Protection Supervisor
[1]B. McVicker, Chemistry Foreman
[1]R. Lewis, Chemistry Foreman
[1]K. Putnam, Technical Support
[1]L. Kriege, Lab Supervisor
A. Arnold, Chemical Engineer

[1]M. Parker, Senior Resident Inspector, NRC
C. Miller, Resident Inspector, NRC

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

[1]Present at the Exit Meeting on September 15, 1989.

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

a. (Closed) Open Item (50-331/88011-02): Licensee will improve the laboratory QA/AC program by resolving problems with standards in the AAS, silica, chloride and boron assays, implement multiple point calibration curves, tabulate technician performance data and implement control charts with more frequent calculation of control chart parameters. The licensee has the elements of an adequate QA/QC program in place. Multiple point calibration curves, independent controls, control charts, intralaboratory and interlaboratory comparison programs are either in place or are being implemented (Section 5). Also, the licensee performed well on the nonradiological chemistry confirmatory measurements program conducted during the previous chemistry inspection (Region III Inspection Report No. 50-331/89013).

3. Management Controls, Organization, and Training (IP 84750)

The management structure of the Chemistry Laboratory is similar to that described in the previous inspection (Region III Inspection Report No. 50-331/89013). Licensee representatives stated that they anticipated full shift coverage to begin early in 1990. The laboratory has eight Journeyman Chemistry Technicians qualified under the ANSI N18.1-1971 standard and five apprentice CTs in various stages of qualification.

No violations or deviations were identified.

4. Water Chemistry Control Program (IP 84750)

The inspector reviewed the water chemistry program as defined by DAEC Plant Chemistry Procedure No. PCP 2.9, "Water Chemistry Guidelines" Revision 6, May 25, 1988. This document was derived from and appeared to be consistent with the EPRI BWR Owners Group Guidelines (OGG). The licensee is committed to this procedure and waivers of Action Level requirements must be approved by the plant superintendent.

Water chemistry parameters are monitored by grab samples and in-line instrumentation. New in-line silica analyzers are scheduled for installation during a future refueling outage. The licensee's hydrogen water chemistry program maintains the Electrochemical Potential (ECP) of reactor water at less than -230mV.

Trend charts for water chemistry parameters are manually plotted by the Chemistry Supervisor and are also maintained in a computer data base. The licensee's manually plotted trend charts were well organized and easy to read. Chemistry parameters are reviewed daily by laboratory management. Parameters out of specification are immediately reported to plant management. Copies of daily status summaries are sent to plant management twice monthly. Presentation of water chemistry parameters are made to Plant and Corporate Management quarterly.

The licensee's water quality appeared to be very good. Chemistry parameters appeared to be within the EPRI achievable values. Reactor water water chloride and sulfate levels were under 5 ppb (Usually about 2 ppb) and conductivity was 0.1 µmho/cm most of the time. Feedwater and condensate parameters were equally good. Silica levels in reactor water were approximately 50 ppb. Silica levels are not mandated in the OGG but are classified as a diagnostic parameter with an achievable value of 100 ppb. No action levels were given for this diagnostic parameter in the OGG. Licensee representatives stated that well water is the source for makeup water and it has a high silica content.

No violations or deviations were identified

5. Implementation of the QA/QC Program in the Chemistry Laboratory (IP 84750)

The inspector reviewed the chemistry QA/QC programs required by DAE Chemistry Quality Control Program CQCP 1.0, Revision 10, February 9, 1989. The licensee maintained control charts on most assays including those involving T/S parameters and the BWR OGG. These charts are manually plotted with the mean value, upper and lower warning limits (± 2 S.D.) and upper an lower control limits (± 3 S.D.). Charts are reviewed monthly by laboratory supervisory personnel. New chart parameters (mean and S.D.) are calculated every six months. The inspector reviewed selected charts and discussed with licensee representatives those charts that exhibited possible biases.

The licensee has independent controls for most assays. The exceptions were those run on the Ion Chromatograph (sodium, chloride and sulfate). The inspector discussed the importance of independent controls and their

relationship to instrument calibration. Licensee representatives stated that independent controls for those assays would be implemented. This will be followed during the next inspection.

Multiple point calibration curves are in use for most assays. The Chemistry Quality Control Manual CQCP 2.0, Revision 10, August 12, 1989, did not appear to specify that multiple point curves be used for all instrument calibration. However, from a review of selected analyses, it appeared that multiple point calibrations were in use for T/S analyses, NRC confirmatory measurement assays and BWR OGG chemistry parameters.

The inspector reviewed the licensee's vendor supplied Interlaboratory Comparison Program. Data from the past year contained some large biases (30% or more) but was very good at other times (very small biases). The licensee performed very well in the NRC Nonradiological Chemistry Confirmatory Program (Region III Inspection Report No. 50-331/89013), achieving 24 agreements in 27 analyses initially (89%) and 26 of 27 (96%) following minor instrument calibration changes. Licensee representatives stated that the procedure for the internal comparison programs was to have a given technician assay the unknown once and report the result. No data averaging appeared to have been done prior to returning the results to the vendor. The inspector discussed acceptance criteria and alternate ways of data presentation including reporting an average and outlier elimination with licensee representatives. The licensee has recently changed vendors and is reviewing this program. Improvements in this program will be followed under Open Item (50-331/89023-01).

The licensee's Intralaboratory Comparison Program has been part of the Interlaboratory Program. Licensee representatives stated that technicians have been tested yearly and a review of selected data suggests that this testing was accomplished. Acceptance criteria used to evaluate technician performance and corrective measures taken when technician test results were outside of the acceptance criteria were not proceduralized. The licensee is developing a new Intralaboratory Program in which technicians will be tested twice yearly. Unknowns will be prepared in-house by a designated chemistry technician who has an advanced degree. Acceptance criteria were being evaluated and are to be formalized in a procedure along with actions to be taken when technician results are outside of the acceptance criterion. These changes should improve this program and provide laboratory management with an improved understanding of the individual technician's performance. Separation of the Interlaboratory and Intralaboratory Comparison Programs should strengthen both. Improvements in the Intralaboratory Comparison Program will be followed under Open Item (50-331/89023-01).

No violations or deviations were identified.

6. Audits and Appraisals

The inspector reviewed the most recent audit of the chemistry laboratory, conducted from September 6-23, 1988, and the laboratory's subsequent response. Three findings and five observations were made. The auditors

appeared to address the QA program for nonradiological chemistry in adequate detail. Items identified in the audit appeared to have been addressed in a timely manner.

Additionally, two Quality Assurance Surveillance Reports were reviewed. The first report, S-89-011, was a review of selected chemistry laboratory practices. No major problems were encountered.

The second surveillance, S-89-016, was concerned with Hydrogen Injection Ramping, "In-Reactor Stress Corrosion Monitoring", Sequence No. 5. The review found performance to be satisfactory. Both Surveillances appeared to have been performed adequately.

No violations or deviations were identified.

8. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspectors, and which involve some action on the part of the NRC or licensee, or both. Open items are discussed in Sections 2 and 5.

9. Exit Interview

The scope and findings of the inspection were reviewed with licensee representatives (Section 1) at the conclusion of the inspection on September 15, 1989. The inspector discussed Open Items in Sections 2 and 5, the licensee's nonradiological chemistry quality control program, and the water quality program. During the exit interview, the inspector discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. Licensee representatives did not identify any such documents or processes as proprietary.