

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-331/87014(DRS)

Docket No. 50-331

License No. DPR-49

Licensee: Iowa Electric Light and Power Company  
Security Building, P. O. Box 357  
Cedar Rapids, IA 52406

Facility Name: Duane Arnold Energy Center

Inspection At: Palo, Iowa

Inspection Conducted: April 28 through May 7, 28-29, and June 1-2, 1987

Inspector: *Rolf A. Westberg*  
Rolf A. Westberg

*7/8/87*  
Date

Approved By: *Ronald N. Gardner*  
Ronald N. Gardner, Chief  
Plant Systems Section

*7/8/87*  
Date

Inspection Summary

Inspection on April 28 through May 7, 28-29, and June 1-2, 1987 (Report No. 50-331/87014(DRS))

Areas Inspected: Special safety inspection by one regional inspector of electrical maintenance (62704); training (41700); Part 21 report followup (92716); and construction testing (63700).

Results: Of the four areas inspected, no violations or deviations were identified in three areas; four violations and one deviation were identified in the remaining area (Failure to assure design control for source and receipt inspection, Paragraphs 4.b.(1)(a), 4.b.(1)(b), and 4.b.(2)(a); failure to correctly specify record retention period, Paragraph 4.b.(1)(c); failure to determine effectiveness of vendor quality control, Paragraph 4.b.(2)(b); failure to qualify source inspectors, Paragraph 4.b.(2)(c); failure to implement source inspection/receipt inspection commitment, Paragraph 4.b.(3).

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## DETAILS

### 1. Persons Contacted

#### Iowa Electric Light and Power Company (IE)

- \*D. Mineck, Plant Superintendent
- \*\*E. Matthews, Quality Assurance Manager
- \*R. Lessly, Manager Design Engineering
- \*B. Lacy, Maintenance Superintendent
- \*J. Thorsteinson, Technical Support Supervisor
- \*C. Mick, Operations Supervisor
- \*R. McCracken, Quality Control Supervisor
- \*L. Voss, Electrical Maintenance Supervisor
- \*G. Van Middlesworth, Training Superintendent
- \*R. Essig, Supervising Quality Assurance Engineer
- \*R. Salmon, Technical Services Superintendent
- \*M. Grim, Site Licensing Engineer
- \*B. Klotz, Quality Assurance Engineer
- \*T. Gordon, Electrical Training
- \*J. Bjorseth, Maintenance Engineer
- \*N. Peterson, Licensing
- \*J. Prolst, Technical Support Engineer
- \*J. Powers, Quality Control Engineer, Procurement
- R. Hannen, Assistant Plant Manager, Operations
- D. Rockshill, Mechanical Maintenance Supervisor
- \*\*D. Church, Systems Engineer
- \*\*V. Crew, Technical Engineer
- \*\*R. Hannen, Plant Superintendent
- \*\*J. Drorsky, Design Engineer
- \*\*J. Wehle, Design Engineering Supervisor
- \*\*K. Peveb, Senior Mechanical Engineer

#### Nuclear Regulatory Commission (NRC)

- \*T. Cappucci, Project Manager, NRR
- \*I. Jackiw, Section Chief
- \*J. Wiebe, Senior Resident Inspector

\*Indicates those attending the exit meeting at the Duane Arnold Energy Center (DAEC) on May 7, 1987.

\*\*Indicates those attending the exit meeting at the DAEC on June 2, 1987.

The inspector also contacted and interviewed other licensee and contractor personnel during the course of this inspection.

## 2. Electrical and Instrumentation Maintenance

The inspector reviewed the procedures for the corrective maintenance program relative to electrical and instrumentation maintenance. The attributes checked included: removal and return to service, use of latest approved drawings and instructions, establishment of QA/QC hold points, requirements for special authorization for activities involving welding, open flame or other ignition sources, provisions to ensure that materials, parts, and components are suitable for their intended use, including environmental qualification, control of housekeeping, control of jumpers and provisions to ensure that personnel qualifications necessary to perform the maintenance activities have been delineated. The inspector also conducted interviews with selected personnel relative to their training.

### a. Documents Reviewed

- (1) No. 1308.1, "Corrective Maintenance," Revision 11.
- (2) No. 1408.2, "Preventive Maintenance," Revision 4.
- (3) No. 1408.9, "Maintenance Trending Procedure," Revision 0.
- (4) No. 1410.5, "Tagout Procedure," Revision 3.
- (5) No. 1410.6, "Jumper and Lifted Lead Control," Revision 4
- (6) Electrical Maintenance Training Program.

### b. Inspection Results

The inspector completed a review of the documented maintenance program for electrical and instrumentation maintenance. The results of the review were acceptable. The inspector also reviewed the training program for electrical maintenance and found it to be too recently implemented to assess.

No violations or deviations were identified in this area.

## 3. Construction Testing

The inspector witnessed a portion of the 250 volt battery discharge test conducted on April 30, 1987. The inspector also reviewed the Design Change Package (DCP) and the related Purchase Order (PO).

### a. Documents Reviewed

- (1) DCP No. 1378, "250 VDC Battery Replacement."
- (2) PO No. S30388

(3) Procedure No. STP 48A005, "Weekly/Quarterly Battery Checks,"  
Revision 12.

(4) Procedure No. STP 48A006, "Battery Discharge Tests,"  
Revision 12.

b. Inspection Results

The inspector observed the performance test of the 250 V battery from Step 4.5 to 4.18 of Procedure No. STP 48006. This included measurement of the individual cell specific gravities, the disconnecting of the battery from the DC bus, the connection of the battery to the BCT-30 capacity test system, and the witnessing of three of the four periods of the test in accordance with the duty cycle for the worst case load profile (HPCI + motors and isolation). Prior to the test, the inspector observed the documentation of a temporary/permanent procedure change to the battery duty cycle. This was required since the test set was not capable of measuring fractions of a minute. The change was accomplished in accordance with the approved procedures.

The battery test was conducted in a professional manner utilizing operators, electricians, and supervisors who had been trained for their specific function prior to the test. When problems were encountered, such as the procedure change, the test was stopped, the situation evaluated and corrective action taken prior to continuing.

Subsequent to this inspection, the documentation of the test results were reviewed in Region III with acceptable results.

No violations or deviations were identified in this area.

4. Part 21 Followup

On March 25, 1987, IE made a 10 CFR Part 21 report and issued an LER pursuant to 10 CFR 50.73(a)(2)(v). These documents pertained to the remote shutdown panels supplied by Frank Electric. The licensee had determined that these panels contained welds that were not adequately qualified. The panels had been installed since July 1985.

On April 23, 1987, the Senior Resident Inspector requested assistance from Region III in reviewing the Part 21. This section documents the results of that review.

a. Documents Reviewed

(1) IE Quality Assurance Manual

(a) Chapter 2, "Quality Assurance Program," Revision 5.

(b) Chapter 4, "Procurement Control," Revision 5.

(2) IE UFSAR/DAEC-1, Revision 5

- (a) 17.2.7.1, "Source Evaluation and Selection."
- (b) 17.2.7.3, "Inspection at the Source."
- (c) 17.2.7.4, "Receipt Inspection."

(3) Quality Assurance Procedures

- (a) No. 1104.6, "Source Inspection," Revision 0, Revision 1, and Revision 2 Draft.
- (b) No. 1105.1, "Receiving Inspection," Revision 2.

(4) Source Inspections

- (a) 86-001
- (b) 86-002
- (c) 86-003
- (d) 86-005
- (e) 86-002

(5) Purchase Order/Receipt Inspections

- (a) S27443
- (b) S2776, Revision 2
- (c) S29513
- (d) S30379
- (e) S30176
- (f) S28511
- (g) S29110
- (h) S31622

b. Inspection Results

(1) Review of the above procedures, indicated the following:

- (a) Paragraph No. 4.3.1 of Procedure No. 1105.1 requires that Quality Control Engineers (Procurement) prepare receiving inspection instructions which define the procurement and quality requirements for receiving inspection. 10 CFR 50, Appendix B, requires that design control measures shall be applied to delineate acceptance criteria for inspections and tests. Review of eight receiving inspection reports did not indicate involvement by the responsible design organization. Failure to establish measures which ensured that the responsible design organization identified the acceptance criteria for the critical characteristics to be verified upon receipt of an item is an example of a violation of Criterion III of 10 CFR 50, Appendix B. (331/87014-01A)
- (b) Paragraphs No. 4.2 and No. 6.1.1 of Procedure No. 1104.6 assigned the responsibility for identifying the specific attributes and characteristics to be inspected and their acceptance criteria to the manager of the responsible design organization who would request a source inspection from Quality Assurance via a memorandum. The inspector could not find documentary evidence to show that this portion of the procedure had been implemented. Failure to identify the critical characteristics and their acceptance criteria for inclusion in the source inspection is a further example of a violation of Criterion III of 10 CFR 50, Appendix B. (331/87014-01B)
- (c) Paragraph No. 7.0 of Procedure No. 1104.6 gave a records retention of six years for Source Inspection Report Forms. Paragraph 2.2.1 of ANSI N45.2.9 lists records that demonstrate capability for safe operation as lifetime records. Failure to correctly implement the Duane Arnold Quality Assurance Manual commitment to Regulatory Guide 1.88 is considered a violation of Criterion II of 10 CFR 50, Appendix B. (331/87014-02)

(2) Review of the source inspections and receipt inspections noted above indicated the following:

- (a) Quality Assurance and Quality Control Engineers, who were not designated as responsible design organizations, established the acceptance criteria for the critical characteristics to be verified during source and receiving inspections in all cases. Failure to establish and coordinate the interface between Engineering, Quality Assurance, and Quality Control is a further example of a violation of Criterion III of 10 CFR 50, Appendix B. (331/87014-1C)

- (b) Source inspections were performed in 1985 and 1986 which failed to properly evaluate all of the critical quality characteristics of the items inspected. This resulted in the release of the remote shutdown panel for shipping and installation in the plant with unqualified welds. Failure to determine the effectiveness of the control of quality by the vendor is considered a violation of Criterion VII of 10 CFR 50, Appendix B. (331/81014-03)
- (c) Two out of eight source inspections performed during 1985 and 1986 were accomplished by unqualified inspectors. ANSI N45.2.13 requires personnel performing verification activities to be qualified in accordance with ANSI N45.2.6. Failure to implement the Duane Arnold Operational Quality Assurance Manual commitment to Regulatory Guide 1.123 is considered a violation of Criterion II of 10 CFR 50, Appendix B. (331/87014-04).
- (3) Section 17.2.7.3 of the Duane Arnold Operational Quality Assurance Program, UFSAR/DAEC-1 requires the establishment of a method to provide information relative to the characteristics that have been inspected at the source and the characteristics that are to be inspected upon receipt. Review of the implementing procedures for source and receipt inspection indicated that this system was not implemented. Failure to implement this commitment is considered an deviation. (331/87014-05)

c. May 18, 1987 Meeting at Region III Between Licensee Personnel and NRC Staff

On Monday, May 18, 1987, at 3:00 p.m., Mr. D. Mineck and others of the Iowa Electric Light and Power Company (IE) met with Mr. W. Guldemon and others of the NRC staff at the NRC Region III office in Glen Ellyn, Illinois, to review their proposed corrective actions relative to the problems identified in this report pertaining to the source and receipt inspections.

During the meeting, engineering involvement in the procurement process relative to source and receipt inspection and the extent of the questionable source inspections were discussed. IE committed to review all the source inspections of vendors without 10 CFR 50, Appendix B, Quality Assurance Programs. They further agreed to include in this review any purchase order where engineering had specified a source inspection. The scope of the review was defined as those items currently installed in the plant. The NRC agreed to assess the results of the IE review at the DAEC site prior to restart of the unit.

d. Followup Inspection Results

On May 28 and June 1, 1987, the inspector returned to the site and assessed the results of the licensee's review of source inspections. Based on their reviews, the licensee had prepared engineering justifications regarding the quality of previously purchased and installed components.

(1) Engineering Justification Reviewed - Listed by Purchase Order Number

(a) 40872	(u) 18427
(b) 39279	(v) 19006
(c) 43876	(w) 12636
(d) 43271	(x) 15302
(e) 45139	(y) 33978
(f) 56001	(aa) 28600E
(g) 1742	(ab) 35225
(h) 4636	(ac) 39376
(i) 2589	(ad) 38187
(j) EG-17295	(ae) 28600ES
(k) E9-18747	(af) 33952
(l) 059251	(ag) 41238
(m) E9-19751	(ah) S31252
(n) S29573	(ai) 28600
(o) S30379	(aj) S27743
(p) S34360	(ak) S30388
(q) S27766	(al) S31622
(r) S30176	
(s) S30373	
(t) 15165	

(2) Inspection Results

From the total population of engineering justifications, the inspector selected six for an indepth review. The packages selected were as follows:

- (a) Boston Insulated Wire and Cable Company - Purchase Order S31252 for coaxial cable.
- (b) Commonwealth Edison - Purchase Order E9-18747 for safety/relief valves.
- (c) National Electric Coil - Purchase Order S38187 for motor rewind and repair.
- (d) Aurora Pump Company - Purchase Order 4636 for bronze impellers.
- (e) Control Components, Inc. - Purchase Order S30373 for 6" pressure control valve.
- (f) C&D Batteries - Purchase Order S30388 for batteries.

The review included purchase orders, purchase specifications, source inspection reports, vendor audits, and receiving inspection reports. The inspector verified that engineering had identified the critical characteristics and their respective acceptance criteria and demonstrated how these attributes had been inspected or otherwise accepted. No further examples of inadequate hardware were identified.

Four violations and one deviation were identified in this area.

5. Enforcement Conference

On June 29, 1987, an enforcement conference was conducted in the Region III office between C. J. Paperiello and members of the NRC staff and R. W. McGaughy and members of the IELP staff. During the conference, the licensee committed to the following corrective actions:

- a. Revision of the procedures affected by the inspection findings.
  - (1) No. QAP 1104.6, "Source Inspection"
  - (2) No. QAP 1105.1, "Receiving Inspection"
  - (3) No. NGD 104.1, "Preparation, Review and Approval of Requisitions"
  - (4) No. NGD 104.7, "Review and Approvals of Vendor Procurement Documents"
- b. A new procedure, No. NGD 104.9, "Acceptance of Items and Services," will be generated.
- c. Past safety related procurements were reviewed with acceptable results.

- d. A Quality Enhancement Program will review the IELP Quality Assurance Manual and implementing procedures. Changes will be made to the QA Program, the QA Manual, and the procedures as required.

There were no major areas of disagreement between the NRC staff and the IELP staff.

6. Exit Meeting

The inspector met with licensee representatives (denoted in Paragraph 1) at the Duane Arnold Energy Center on May 7 and June 2, 1987, and summarized the purpose, scope and findings of the inspection. The inspector 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.