

UNITED STATES  
ATOMIC ENERGY COMMISSION  
DIRECTORATE OF REGULATORY OPERATIONS  
REGION III  
799 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137

TELEPHONE  
(312) 858-2660

A. RO Inspection Report No. 050-331/73-16

Transmittal Date : January 11, 1974

Distribution:  
RO Chief, FS&EB  
RO:HQ (5)  
DR Central Files  
Regulatory Standards (3)  
Licensing (13)  
RO Files

Distribution:  
RO Chief, FS&EB  
RO:HQ (4)  
L:D/D for Fuels & Materials  
DR Central Files  
RO Files

B. RO Inquiry Report No. \_\_\_\_\_

Transmittal Date : \_\_\_\_\_

Distribution:  
RO Chief, FS&EB  
RO:HQ (5)  
DR Central Files  
Regulatory Standards (3)  
Licensing (13)  
RO Files

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DR Central Files  
RO Files

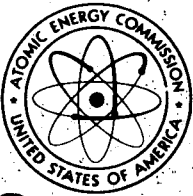
C. Incident Notification From: \_\_\_\_\_  
(Licensee & Docket No. (or License No.))

Transmittal Date : \_\_\_\_\_

Distribution:  
RO Chief, FS&EB  
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TELEPHONE  
(312) 858-2660

JAN 11 1974

Iowa Electric Light and Power Company  
ATTN: Mr. Charles W. Sandford  
Vice President, Engineering  
Security Building  
P. O. Box 351  
Cedar Rapids, Iowa 52405

Docket No. 50-331

Gentlemen:

This refers to the inspection conducted by Messrs. Boyd, Fisher, and Schumacher of this office on November 27-30, 1973, of activities at the Duane Arnold site authorized by AEC Construction Permit No. CPPR-70 and to the discussion of our findings held by the inspectors with Messrs. Hunt, Hammond and other members of your staff at the conclusion of the inspection.

A copy of our report of this inspection is enclosed and identifies the areas examined during the inspection. These areas included a review of initial fuel loading procedures; power ascension testing; containment leak rate testing; operating organization quality assurance program; preoperational/acceptance testing items; Safety Review Committee functions; and items related to the health physics activities at the facility. Within these areas, the inspection consisted of selective examination of procedures and representative records, interviews with plant personnel, and observations by the inspectors.

No violations of AEC requirements were identified within the scope of this inspection.

In accordance with Section 2.790 of the AEC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the AEC's Public Document Room. If this report contains any information that you or your contractors believe to be proprietary, it is necessary that you make a written application to this office, within twenty days of your receipt of this letter, to withhold such information from public disclosure. Any such application must include a full statement of the reasons for which it is claimed that the information is proprietary, and should be prepared so the proprietary information identified in the application is contained in a separate part of the document. Unless we receive an application to withhold information or are otherwise contacted within the specified time period, the written material identified in this paragraph will be placed in the Public Document Room.

Iowa Electric Light and  
Power Company

- 2 -

JAN 11 1974

Should you have any questions concerning this inspection, we will be glad to discuss them with you.

Sincerely yours,

James G. Keppler  
Regional Director

Enclosure:

RO Inspection Rpt No. 050-331/73-16

cc: C. Hunt, Chief Engineer  
DAEC Site

bcc: RO Chief, FS&EB  
RO:HQ (4)  
Licensing (4)  
DR Central Files  
RO Files  
PDR  
Local PDR  
NSIC  
DTIE  
OGC, Beth, P-506A

U. S. ATOMIC ENERGY COMMISSION  
DIRECTORATE OF REGULATORY OPERATIONS

REGION III

RO Inspection Report No. 050-331/73-16

Licensee: Iowa Electric Light and Power Company  
Security Building  
P. O. Box 351  
Cedar Rapids, Iowa 52405

Duane Arnold Energy Center  
Palo, Iowa

License No. CPPR-70  
Category: B

Type of Licensee: BWR, 538 Mwe

Type of Inspection: Routine, Unannounced

Dates of Inspection: November 27-30, 1973

Dates of Previous Inspection: September 11-13, 1973 (T&S)

Principal Inspector: *D.C. Boyd*  
D. C. Boyd

*1-9-74*  
(Date)

Accompanying Inspectors: W. L. Fisher

M. C. Schumacher

Other Accompanying Personnel: None

Reviewed By: *D.M. Hunnicutt*  
D. M. Hunnicutt, Chief  
Reactor Testing and Startup Branch

*1/9/74*  
(Date)

## SUMMARY OF FINDINGS

### Enforcement Action

There were no enforcement actions identified as a result of this inspection.

### Licensee Action on Previously Identified Enforcement Matters

All previously identified enforcement matters have been satisfactorily resolved.

Design Changes: Not Applicable.

### Unusual Occurrences

No unusual occurrences were identified as a result of this inspection.

### Other Significant Findings

#### A. Current Findings

##### 1. Status Report

- a. Construction - 96% complete.
- b. Fuel load target date - January 1974.
- c. AEC licensing examinations - orals - December 10, 1973.
- d. Preoperational/acceptance test procedures written - 82%.
- e. Preoperational/acceptance test procedures approved for performance - 56%.
- f. Preoperational/acceptance test procedures performed - 22%.

##### 2. Stack Sampling Line

The stack sampling line may not be insulated and heat-traced.  
(Paragraph 8)

##### 3. Off-Shift Radiation Protection

The licensee has not determined how to ensure adequate radiation protection during the off-shifts. (Paragraph 9)

#### 4. Technical Training and Shift Staffing

Radiation and Chemistry Technician training appears not to have been completed. (Paragraph 10)

#### B. Status of Previously Reported Unresolved Items

The inspector's determination of the status of previously identified outstanding or unresolved items are as follows:

##### 1. Testing of Facility Communications Systems

Preoperational tests to verify the operability of the station's various communications systems are currently being prepared. Three of the five system preoperational test procedures are in final draft form. (Paragraph 3)

##### 2. Loss of Instrument Air Test

The licensee is currently preparing a test procedure for the plant response to the loss of instrument air. The testing will include all plant systems (both safety related and non-safety related), thus resolving the Regulatory concerns expressed in previous reports. According to the licensee the testing will be performed in two phases. First, with the system in a non-operating mode, but with all valves in their normal operating position, the instrument air will be cut off. Verification of proper system response to the loss instrument air will then be made. The second phase of the testing will be made by cutting off the instrument air with the systems in the normal operating mode.

#### Management Interview

#### Persons Present

##### Iowa Electric Light and Power Company (IEL&P)

G. Hunt, DAEC Chief Engineer  
E. Hammond, DAEC Assistant Chief Engineer  
G. Cook IEL&P Quality Assurance Manager  
D. Wilson, DAEC Results Engineer  
R. Rinderman, DAEC Quality Supervisor  
L. Root, DAEC Assistant Projects Manager  
H. Rehrauer, IEL&P Project Engineering Supervisor  
D. Moen, DAEC Technical Staff Supervisor  
R. Graybeal, Radiation Protection Engineer

Directorate of Regulatory Operations, Region III

D. Boyd, Principal Inspector

W. Fisher, Senior Health Physicist, Facilities Radiological  
Protection Section

M. Schumacher, Radiation Specialist, Radiological Protection Section

Subjects Discussed

The following subjects were discussed:

- A. Preoperational/acceptance testing status. (Paragraph 1)
- B. Initial fuel loading procedure. (Paragraph 2)
- C. Communications system testing. (Paragraph 3)
- D. Startup Test instructions. (Paragraph 4)
- E. Integrated containment leak rate testing. (Paragraph 5)
- F. Operating organization quality assurance program. (Paragraph 6)
- G. Miscellaneous items and from the inspector's outstanding inspection item list. (Paragraph 7)
- H. Health physics items (see Report Details, Part II).
- I. Operational Readiness Activities

1. Preoperational/Acceptance Testing Status

This testing program is in progress and is approximately 22% complete. (Paragraph 1)

2. Initial Fuel Loading Procedure

An RO:III review of an (unapproved) draft of the initial fuel loading procedure indicates that a number of areas remain to be addressed before an acceptable procedure is provided.  
(Paragraph 2)

- J. The inspector noted that the stack sampling line might freeze and plug unless insulated and heat-traced. The licensee agreed to consider this.  
(Paragraph 8)

- K. The inspector noted that the licensee has not determined how to ensure adequate radiation protection during the off-shifts. The licensee agreed to do so. (Paragraph 9)
- L. The inspector noted that Radiation and Chemistry Technician training appears not to have been completed. The licensee agreed to ensure and document that personnel have been properly trained. (Paragraph 10)



## REPORT DETAILS

### Part I

#### Persons Contacted

##### Duane Arnold Energy Center (DAEC)

##### Iowa Electric Light and Power Company (IEL&P)

G. Hunt, DAEC Chief Engineer  
L. Root, DAEC Assistant Project Manager  
E. Hammond, DAEC Assistant Chief Engineer  
H. Rehrauer, IEL&P Project Engineering Supervisor  
J. Gebert, DAEC Electrical Maintenance Supervisor  
G. Cook, IEL&P Quality Assurance Manager  
D. Flanagan, IEL&P Project Engineer  
D. Wilson, Results Engineer  
D. Moen, DAEC Technical Staff Supervisor  
R. York, DAEC Operations Supervisor  
R. Lehman, DAEC Mechanical Maintenance Supervisor  
R. Rinderman, DAEC Quality Supervisor  
J. Weeda, IEL&P Reactor and Plant Performance Engineer  
K. Meyer, Nuclear Design Engineer  
K. Haas, IEL&P Reactor and Plant Performance Engineer  
R. Graybeal, Radiation Protection Engineer

##### Nuclear Service Corporation (NSC)

G. Engle, DAEC Technical Staff (on contract from NSC)

##### Bechtel Corporation (Bechtel)

P. Huaman, Project Engineer  
W. Weston, Project Engineer  
J. Duffy, Project Engineer  
R. Smith, Project Engineer

#### 1. Preoperational/Acceptance Test Program Status

The inspector met with the DAEC Results Engineer and other members of DAEC management to discuss the current status of this program. As of November 28, 1973, the status is as follows:

	<u>Preoperational Tests</u>	<u>Acceptance Tests</u>
Approved by Iowa Electric	38	33
Bechtel Startup preparing approval copy	3	1
Initial Review by Iowa Electric in progress	0	2
Initial Review by Bechtel in progress	3	5
Procedures remaining to be written	11	8
Tests complete - under review	12	10
Tests in progress	14	5
Tests not yet started	31	35

The inspector reviewed the test packages for five completed preoperational/acceptance test packages, as follows:

<u>Test No.</u>	<u>Title</u>
2	125 volt DC system
14	Fire protection
17	Instrument AC control power
19	Service air
57	Uninterruptable AC control power

It was observed that these test packages were being prepared, maintained, and reviewed in accordance with approved administrative procedures. It was also observed that as some of the tests were being performed, changes to the test procedure were found to be necessary or desirable. The inspector inquired regarding how these changes are incorporated into the operating procedures for the affected systems. The licensee stated that they do have identified programs for the check out and correction of system operating procedures during the performance of the cold functional and hot functional testing phases of the plant readiness program. The

licensee stated that they would consider updating and correcting system operating procedures during the preoperational/acceptance testing phase. RO:III will follow.

2. Initial Fuel Loading Procedure

The inspector was provided with a draft of a proposed initial fuel loading procedure. The inspector's review revealed that this procedure was in the format of a start-up test instruction and was primarily addressed to those activities directly related to the loading of the core. The inspector stated that Regulatory expects to see a very comprehensive procedure which encompasses all aspects of initial fuel loading, such as a specific identification of the status required for each system necessary for fuel loading (including verification check lists); a description of the responsibilities of each member of the fuel loading crew (including the relationship between organizations that may participate in the loading); establishment of criteria for (a) continuing fuel loading, (b) stopping fuel loading, (c) reducing loading increments, and (d) actions to be taken in the event of foreseeable emergencies. The licensee stated that consideration had been given to each of these areas and that these items and others would either be incorporated directly into the initial fuel loading procedure or would be referenced in the procedure. RO:III will follow.

3. Communications System Testing

In response to the inspector's inquiry regarding the status of testing of the facilities communication systems, the licensee provided the inspector with draft copies of preoperational tests for three of the stations communication systems. The licensee stated that preoperational testing will be performed on five of the facilities communications systems and that the preparation of these test procedures is in progress. RO:III will follow.

4. Startup Test Instructions

The inspector received drafts of 34 startup test instructions for review. These startup test instructions which are the implementing procedures for the startup program are currently being circulated for final review and comment. The RO:III review of the startup program (startup test specifications) has been completed<sup>1/</sup> and the RO:III review of the implementing procedures (startup test instructions) is in progress.

1/ RO Inspection Reports No. 050-331/73-11 and No. 050-331/73-13.

## 5. Integrated Leak Rate Testing

The inspector met with the IEL&P project engineer having the responsibility for the preparation and implementation of the integrated leak rate test procedure. A review and discussion of Revision 5 of this procedure indicates that this procedure is complete. No areas of Regulatory concern were identified. Areas reviewed and discussed included listing and testing of portions of the system requiring Type B and Type C testing; evaluation of Type B and Type C data; verification that all essential measurements (pressure, temperature flow) made on the Type B and Type C and those to be made during the Type A test are made with instrumentation whose calibration is traceable to the National Bureau of Standards (NBS); acceptance criteria; equations utilized for calculating overall leak rate; verification of instrument accuracy and calculations by superimposed known leak rate testing; and test data review analysis and reporting plans. The licensee stated that this test is tentatively scheduled to begin on or about December 20, 1973. The inspector requested that he be notified one week prior to the start of this test and indicated that he intends to witness portions of the test.

One area, which will not delay the performance of the integrated leak rate test, but which will require further discussion and possible corrective action was identified by the inspector. This area is in regard to the reliability of the closure of the Traversing Incore Probe (TIP) isolation valves when high drywell pressure exists. Regulatory has previously identified a concern in the area<sup>2/</sup> and the system designer has provided guidance to the licensee. At present the licensee states that they are evaluating this guidance for possible implementation. The licensee does not believe that an unsafe condition exists since each of the valves in question has position indicating lights in the control room, and each of these valves has a redundant explosive actuated shear valve, also operable from the control room, in series with it. Thus, the licensee contends that adequate administrative and procedural controls will exist, prior to fuel loading, to assure that containment integrity can be attained manually if the automatic closure of the TIP isolation valves does not occur. RO:III will follow this matter.

## 6. Operating Organization Quality Assurance Program

The inspector met with members of Nuclear Services Corporation (NSC) IEL&P Quality Assurance and DAEC Quality Assurance, to discuss RO:III.

- 2/ Letter, Traversing Incore Probe Containment Isolation Valves, G. W. Reinmuth to D. J. Skovholt, 8-30-73.

comments on DAEC administrative control procedures and quality assurance directives. All items discussed were minor in nature and all were satisfactorily resolved.

The inspector was provided with six additional approved quality assurance directives, leaving only one directive to be issued to complete the operating quality assurance manual. The inspector also received updated revisions of the DAEC administrative control procedures. All of these procedures are now issued for implementation on a trial issue and comment basis.

The inspector informed the licensee that a final RO:III inspection, to assure that the operating quality assurance program had been prepared and implemented, would be conducted prior to the issuance of an operating license.

## 7. Miscellaneous Inspection Items

### a. Fuel Element Inspection

The licensee stated that a 100 percent reinspection effort was conducted on all fuel elements after they were returned from the vendor's plant following an examination for lower the plate casting deficiencies. This reinspection revealed that two of the elements were fitted with incorrect lower the plate assemblies, as follows:

- (1) Low enrichment element No. AR-75 (Type 1) was fitted with a lower tie place assembly containing a full flow orifice assembly. It should have been fitted with a lower tie plate assembly containing a reduced flow orifice. The inspector reviewed records which verified that this error was corrected at the site.
- (2) High enrichment element No. AR-85 (Type 2) was fitted with a lower tie plate assembly having a reduced flow orifice. It should have been fitted with a lower tie plate assembly containing a full flow orifice. The inspector reviewed records which verified that this error was corrected at the site.

The inspector reviewed the inspection records and all of the fuel elements and observed that 17 specific checks had been performed on each element, including the checks for correct lower tie plate assembly and orificing. The inspector had no further questions in this area.

b. Safety Review Committee Functions

The inspector met with members of the Safety Review Committee to discuss areas that would be included in their review. Agreement was reached that in addition to the review of all preoperational test packages they would also review certain acceptance test packages. These include:

Fire protection

Communications

Instrument Air

Component Cooling (partial)

Previous inspections<sup>3/</sup> have shown that the Safety Committee is functional and is performing in accordance with an approved charter.

c. IEL&P Personnel Reassignments

The licensee informed the inspector that five systems engineers from the IEL&P Project Engineering Group have been reassigned to the DAEC Operations Group to provide direct technical assistance during the period of heavy work load, i.e., preoperational/acceptance testing. These assignments are as follows:

Health Physics - One Man

Mechanical Maintenance Supervisor - One Man

Administrative Supervisor - One Man

Electrical Maintenance Supervisor - Two Men

According to the licensee these engineers have participated in the design of the facility systems and thus have the expertise to provide direct technical assistance in the performance of tests, the evaluation of test data, and the preparation and evaluation of system operating and maintenance procedures.

3/ RO Inspection Report No. 050-331/73-13.

d. Diesel Generator Manual Stop Circuit

The inspector reviewed the diesel generator manual control system prints with cognizant members of the licensee's maintenance staff. The inspector's primary areas of interest were:

- (1) Alarms and annunciators associated with the manual deactivation of the diesels.
- (2) Returning the diesel generator circuits to a "ready to start" status following a manual shutdown.

The inspectors' review of the prints plus visits to the diesel generator local control stations, and the control room, verified the following:

- (1) Manual shutdown or deactivation of a diesel generator requires the actuation of a key lock switch. (Key under administrative control by shift supervisor.) Actuation of the key lock switch to the "lockout" positions annunciated locally (light) on the local panel, and is annunciated audibly and by annunciator lights in the control room.
- (2) Returning the keylock switch to the "automatic" or "start" positions resets the diesel generator circuitry for automatic functioning and resets the above identified annunciators.

The inspector stated that he had no further questions in this area.

## REPORT DETAILS

### Part II

Prepared By: W. L. Fisher 1/9/74  
W. L. Fisher (Date)

Prepared By: M. C. Schumacher 1/9/74  
M. C. Schumacher (Date)

Reviewed By: J. M. Allan 1-9-74  
J. M. Allan (Date)

#### 8. Stack Sampling Line

The licensee was not certain whether the stack sampling line would be insulated and heat-traced to prevent freezing.

#### 9. Shift Staffing

Proposed Technical Specification 6.0 states that "At least one member of each operating shift crew shall be qualified to implement radiation protection procedures." The licensee has not yet determined how this specification will be implemented.

#### 10. Radiation Protection and Chemistry Training

Training required before fuel loading is listed in FSAR Table 13.3.-1. Training records show that, except for one recently hired Radiation and Chemistry Technician, the following training has been accomplished:

<u>Person(s)</u>	<u>Completed Training</u>
Radiation Protection Engineer	"BWR Chemistry" "Radiological Engineering"
Chemist	"BWR Chemistry" "Radiological Engineering"
Radiation and Chemistry Technician	"Radiation Safety"
Assistant Radiation and Chemistry Technician	"Radiation Safety"



Training records do not show that the training entitled, "Basic Nuclear Physics and Plant Chemistry" has been received by Radiation and Chemistry Technicians and Assistant Radiation and Chemistry Technicians.

Reactor operators are scheduled to receive two weeks of Radiation Protection Training during the 16-week Basic Nuclear Course described in Section 13.3 of the FSAR. The training records do not show that all operators have received this training.

Remaining plant personnel are scheduled to receive a 20-hour condensed version of the above course. The records show that this training is 80% complete.

All plant personnel will receive a training course based on the Plant Radiation Protection Manual.

11. Chemistry and Radiochemistry

Progress in readying laboratories and procedures appears to be adequate.

12. Counting Rooms

Progress in calibrating counting room instruments appears to be adequate.