

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-331/84-12(DRP)

Docket No. 50-331

Licensee 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: Palo, IA

Inspection Conducted: July 26 - September 25, 1984

Inspector: L. S. Clardy

Approved By: *D.C. Boyd*  
D. C. Boyd, Chief  
Projects Section 1B

10-11-84  
Date

Inspection Summary

Inspection on July 26 - September 25, 1984 (Report No. 50-331/84-12(DRP))

Areas Inspected: Routine, unannounced inspection by the resident inspector of licensee actions on previous items; operations; maintenance; surveillance; Licensee Event Reports; and independent inspection. The inspection involved a total of 101 inspector-hours onsite by one NRC inspector including 11 inspector-hours onsite during off-shifts.

Results: Of the six areas inspected, one item of noncompliance was identified (paragraph 7e).

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## DETAILS

### 1. Persons Contacted

- R. McGaughy, Manager, Nuclear Division
- \*D. Mineck, Plant Superintendent-Nuclear
- P. Ward, Director, Nuclear Division
- \*R. Hannen, Assistant Plant Superintendent-Operations
- \*K. Young, Assistant Plant Superintendent-Radiation Protection and Security
- \*C. Mick, Operations Supervisor
- \*B. Miller, Technical Support Supervisor
- W. Holden, Radiation Protection Instructor
- A. Clason, Maintenance Supervisor

In addition, the inspector interviewed several other licensee personnel including shift supervising engineers, control room operators, engineering personnel, administrative personnel and contractor personnel (representing the licensee).

\*Denotes those personnel present at the exit interviews.

### 2. Action on Previously Identified Inspection Items

(Closed) Open Item (331/84-04-01(DRP)): Improper heat treatment of Anchor-Darling valve stems. The licensee has determined that no failures of the valve stems have occurred at DAEC. In addition, none of the valves are used in safety systems that are required to reposition on a design basis event.

No items of noncompliance or deviations were identified.

### 3. Operational Safety Verification

The inspector observed control room operations, reviewed applicable logs and conducted discussions with control room operators during the inspection period. The inspector verified the operability of selected emergency systems, reviewed tagout records and verified proper return to service of affected components. Tours of reactor building and turbine building were conducted to observe plant equipment conditions, including potential fire hazards, fluid leaks, and excessive vibrations and to verify that maintenance requests had been initiated for equipment in need of maintenance. The inspector by observation and direct interview verified that the physical security plan was being implemented in accordance with the station security plan.

The inspector observed plant housekeeping/cleanliness conditions and verified implementation of radiation protection controls. During the inspection period, the inspector walked down the accessible portions of the Standby Liquid Control and the Diesel Generator systems to verify operability. The inspector also witnessed portions of the radioactive waste system controls associated with radwaste shipments and barreling.

These reviews and observations were conducted to verify that facility operations were in conformance with the requirements established under technical specifications, 10 CFR, and administrative procedures.

No items of noncompliance or deviations were identified.

4. Monthly Maintenance Observation

Station maintenance activities of safety-related systems and components were observed to ascertain that they were conducted in accordance with approved procedures, regulatory guides and industry codes or standards and in conformance with technical specifications.

The following items were considered during this review: the limiting conditions for operation were met while components or systems were removed from service; approvals were obtained prior to initiating the work; activities were accomplished using approved procedures and were inspected as applicable; functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; activities were accomplished by qualified personnel; parts and materials used were properly certified; radiological controls were implemented; and, fire prevention controls were implemented.

Work requests were reviewed to determine status of outstanding jobs and to assure that priority is assigned to safety related equipment maintenance which may affect system performance.

No items of noncompliance or deviations were identified.

5. Monthly Surveillance Observation

The inspector observed technical specifications required surveillance testing on the Residual Heat Removal and Reactor Core Isolation Cooling systems and verified that testing was performed in accordance with adequate procedures, that test instrumentation was calibrated, that limiting conditions for operation were met, that removal and restoration of the affected components were accomplished, that test results conformed with technical specifications and procedure requirements and were reviewed by personnel other than the individual directing the test, and that any deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

No items of noncompliance or deviations were identified.

6. Licensee Event Reports Followup

Through direct observations, discussions with licensee personnel, and review of records, the following event reports were reviewed to determine that reportability requirements were fulfilled, immediate corrective action was accomplished, and corrective action to prevent recurrence had been accomplished in accordance with technical specifications.

One item of noncompliance was identified in conjunction with LER 84-029. This item was cited in Inspection Report No. 50-331/84-11(DRP).

- a. (Closed) LER 84-025: Reactor Core Isolation Cooling (RCIC) inoperable. The torque switch in the steam supply valve was out of adjustment causing the electrical breaker to open when the valve cycled. The switch was readjusted and RCIC tested satisfactorily.
- b. (Closed) LER 84-026: Standby Filter Units inoperable. The units were repaired and returned to service.
- c. (Closed) LER 84-027: Reactor scram as a result of a mechanical shock to an instrument rack. During construction of a scaffold, a scaffold pipe fell and jarred the reactor high pressure scram switches and a scram resulted. All systems responded normally. Plant personnel were cautioned against such incidents and sensitive instrument areas were posted and painted as such.
- d. (Closed) LER 84-028: Degraded grid voltage and reactor scram. On July 14, 1984, while in the startup mode, the licensee experienced a degraded grid voltage condition, which resulted in a reactor trip, as designed. All systems functioned as required. The cause of the degraded voltage was a transient at a fossil fuel plant. This event is also discussed in Inspection Report 50-331/84-08(DRP).
- e. (Closed) LER 84-029: Standby Liquid Control (SRLC) system inoperable due to personnel error. The SBLC system was made inoperable due to a valving error during a surveillance test. The error was found and corrected by the licensee approximately five hours later. This event is evaluated in a special Inspection Report, No. 50-331/84-11(DRP). The licensee was cited for this event.

## 7. Independent Inspection

### a. NRC Vendor Inspection at General Electric

A vendor inspection (Report No. 99900911(84-01)) done at General Electric (GE) revealed a potential problem with pressure switch Model No. 219B4684. These switches are used at Duane Arnold in the relief valve tailpipes.

The inspection report stated that the lead wire for the pressure switch had not met a 500 volt electrical test as required by GE.

A review of GE documentation and interviews with licensee personnel indicate that the switch is qualified with the exception of water immersion. The possibility of a water immersion event at DAEC is extremely low; therefore, continued use of the switches is justified.

b. General Employee Requalification Training

The inspector observed a requalification class on September 13, 1984. The training included a general overview of radiation protection and security, and included site specific applications. The instructor allowed adequate time for questions. The training also covered recent events such as the Standby Liquid Control isolation and secondary containment violations, and the consequences of such events.

c. IE Bulletin 79-14

During the inspection period the licensee identified discrepancies between the as-built configuration and the design drawings for seismic restraints which were generated by Bechtel for the licensee in response to IEB 79-14. The discrepancy rate was 20% to 30% for those restraints checked to date. There have been no instances in which the seismic loading would be exceeded on a design basis event. The licensee is continuing to walkdown piping to identify further discrepancies.

The NRC has not closed out IEB 79-14 at DAEC. The Division of Reactor Safety (DRS) of Region III will inspect licensee actions.

d. Fire in "A" Cooling Tower Switchgear Building

On September 4, 1984, a fire started in the "A" cooling tower switchgear building. The building is outside the protected area and adjacent to the "A" cooling tower.

Several factors contributed to the fire. A temporary space heater was in the building to prevent freezing during winter. The heater was facing a wall with exposed insulating siding. The heater was wired to a lighting panel, but the circuit breaker was marked "mast lights." (The mast lights are not used at DAEC.) There was a tag on the breaker indicating that the heater was powered from that circuit breaker.

Previously the cooling tower lighting, which is not powered from the same breaker, had been tripping off. The operator mistakenly reset the mast light breaker (thereby inadvertently turning on the heater) the morning of September 4, 1984, and left the area. The heater caused the insulating material to smoke heavily and arc into a fire in the overhead area.

The control room operators took appropriate action based on indications. They experienced a lowering vacuum (due to electrical power loss to the "A" cooling tower fans), a loss of "A" tower basin level instrumentation, and a fire alarm (due to power loss). They announced the fire and commenced a controlled power reduction to 60%.

The fire brigade, security, and offsite agencies responded and were able to control and extinguish the fire.

The licensee classified the event in accordance with emergency action guidelines and reported the event within the allowable time.

The licensee is considering the following corrective actions: installation of smoke sensors, upgraded controls on temporary power supplies, larger licensee emergency response vehicles to accommodate personnel and equipment, and covering the insulation or installing a different insulation.

During the event the entire plant paging system and the site fire alarms were lost due to electrical faults in the switchgear building. The system was not designed such that a local fault would be automatically isolated, keeping the rest of the system on the line. The licensee is investigating a design change to the system. This design change is an Open Item, (50-331/84-12-01(DRP)).

e. Secondary Containment Violations

On August 21 and 27, and September 10 and 20, the licensee experienced secondary containment violations. With the exception of the event on August 21, 1984, all the violations resulted from equipment malfunctions.

On August 21, 1984, with the reactor building railroad airlock inner double doors open, a mechanic requested permission from the control room to break secondary containment momentarily so he could exit through the personnel door from the railroad airlock into the machine shop area to eat lunch. When permission was denied, the mechanic requested another individual on the other side of the door to remove the interlock fuses (which would defeat the interlock) so he could exit. The second individual did as requested. This was, then, a deliberate violation of secondary containment (the mechanic recently had been in meetings conducted by the licensee to discuss the need for correction of personnel actions and errors). The action of the two individuals was noted independently by a security guard who was present because of the movement of the equipment through the airlock, and by a health physics technician. Both individuals immediately called their respective supervisors who in turn notified the control room. Both of the involved employees were fired.

Technical Specifications Section 3.7.C.1 states: "Secondary containment integrity shall be maintained during all modes of plant operation except when all of the following conditions are met.

The reactor is subcritical and Specification 3.3.A is met.

The reactor water temperature is below 212° F and the reactor coolant system is vented.

No activity is being performed which can reduce the shutdown margin below that specified in Specification 3.3.A.

The fuel cask or irradiated fuel is not being moved in the reactor building."

Contrary to the above, secondary containment was deliberately violated when the reactor was at power. This is an Item of Noncompliance (50-331/84-12-02(DRP)).

A momentary violation of secondary containment normally would be a Level V noncompliance. However, because the event was deliberate and the employee was previously instructed on the importance of adherence to plant procedures and on possible disciplinary actions for non-adherence to them, this is considered a Level IV noncompliance.

Because the licensee's corrective actions for this deliberate event are adequate, and because corrective actions for the equipment malfunction events such as increased personnel awareness of secondary containment importance, implementation of a scheduled surveillance and test program for interlocks, posting of watches and special signs during airlock maintenance, and an engineering review of interlock improvements also are adequate, no response is required to this notice.

The events are described in LERs 331/84-030 and 331/84-034. This report closes LERs 331/84-030 and 331/84-034.

8. Exit Interview

Due to the length of the inspection and the diversity of areas inspected, exit interviews were conducted on a weekly basis between the NRC inspector and the appropriate licensee personnel. In each case the scope and findings of the individual inspection areas were summarized.