

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-331/82-03(DPRP)

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: Duane Arnold Site, Palo, IA

Inspection Conducted: April 1 - May 31, 1982

Inspector: *L. Clardy*
L. Clardy

8/3/82

Approved By: *L. Reyes*
L. Reyes, Chief
Projects Section 2C

8/3/82

Inspection Summary

Inspection on April 1 - May 31, 1982 (Report No. 50-331/82-03(DPRP))

Areas Inspected: Routine resident inspection of Operational Safety Verification; Maintenance Observation; Surveillance Observation; Plant Trips; Independent Inspection; Followup on Previously Identified Items; Licensee Event Report Followup; IE Circular Followup; Test and Measurement Equipment Program; Surveillance Testing and Calibration Control Program; and Plant Trips. The inspection involved a total of 222 inspector-hours onsite by one NRC inspector including 58 inspector-hours onsite during off-shifts and 36 man-hours by the Region III staff for the June 4 Enforcement Conference.

Results: Of the ten areas inspected, no items of noncompliance or deviations were identified in nine areas. One item of noncompliance was identified in one area (Failure to follow procedures - paragraph 3).

DETAILS

1. Persons Contacted

Iowa Electric Light and Power Company

- R. McGaughey, Director Nuclear Generation
- *D. Mineck, Plant Superintendent-Nuclear
- P. Ward, Manager Design Engineering
- *D. Wilson, Assistant Plant Superintendent-Rad Prot./Security
- J. Vinquist, Assist. Plant Superintendent-Technical Support
- B. York, Assist Plant Superintendent-Operations
- *D. Teply, Operations Supervisor
- C. Mick, Assistant Operations Supervisor
- J. VanSickel, Technical Support Supervisor
- L. Voss, Assistant Electrical Maintenance Supervisor
- J. Sweiger, Electrical Maintenance Supervisor
- R. Rockhill, Mechanical Maintenance Supervisor
- R. Hannen, Maintenance Supervisor
- E. Matthews, Corporate Quality Assurance Manager
- *J. Kerr, Corporate Quality Assurance
- *B. Klotz, Quality Control Inspector

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 contacted at the exit interviews.

2. Followup on Previously Identified Noncompliance, Unresolved, and Open Items

The inspector reviewed the following items to verify that the licensee's response and actions taken were in accordance with regulatory requirements, technical specifications, approved procedures, and accepted industry standards. The inspector also verified that the response and actions were done in a timely manner, and were in accordance with previously made commitments.

(Open) Unresolved Item (331/80-15-02): Overrange of RCIC suction pressure guage. The licensee has evaluated the design and will replace the guage.

(Closed) Noncompliance (331/80-23-01): Design Change 918. Group 3 isolation logic was reinstalled correctly.

(Closed) Noncompliance (331/81-12-01): Inadequate Design Change Review. The licensee now has formal procedures and review committees to ensure the design will perform its intended functions.

(Open) Open Item (331/81-15-01): Barton PDIS Drift. The licensee will replace the 288A model PDIS.

(Closed) Open Item (331/81-15-02): Moisture Carryover in Drywell Radiation Monitors. The licensee corrective actions consisting of heat tracing of the piping and daily checks of the filters have alleviated the problem.

(Closed) Open Item (331/81-17-01): Revision of Rod Scram Time STP. The licensee has specified the CRD accumulator pressure and calibration traces required.

(Closed) Open Item (331/81-17-03): Inoperable LPRMs During Startup. The LPRMs in question were repaired.

(Closed) Noncompliance (331/81-17-04): Use of Outdated Procedures to Determine Reactivity Anomalies. The licensee has corrected STP 43D001 and taken appropriate corrective action to prevent recurrence.

(Closed) Open Item (331/81-18-01): HPCI Suction Switch. The licensee has placed precautions to appropriate operating procedures to monitor HPCI suction lineup during power supply transients.

(Closed) Noncompliance (331/81-27-03): Document Change Forms not Reviewed Within 30 days. The licensee has adequate procedures in place to ensure all reviews are completed on time.

(Open) Open Item (331/82-01-01): RHR Keep Fill System. The keep fill pump impeller will not supply adequate flow. The licensee will replace it with a larger one as parts become available. Interim precautionary measures are still in place to ensure RHR operability.

3. Operational Safety Verification

The inspector observed control room operations, reviewed applicable logs and conducted discussions with control room operators during the months of April and May. The inspector verified the operability of selected emergency systems, reviewed tagout records and verified proper return to service of affected components. Tours of the 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 High Pressure Core Injection (HPCI) systems to verify operability.

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.

Three instances occurred during the inspection period which indicate that better controls should be instituted by the licensee to assure procedure adherence and personnel awareness of plant conditions. One instance occurred on May 9, 1982, with the plant shutdown for maintenance when the licensee was attempting to reset the Reactor Protection System (RPS) by bypassing the Scram Discharge Volume (SDV) trips. The operator returned the bypass switch to normal when the three gallon level alarm had cleared; however, since the sixty gallon RPS trip alarm had not cleared an RPS trip resulted. The oncoming shift also performed the same evolution with the same results. It was not until the next day that the event was analyzed as a result of the inspectors questioning to determine why the three gallon alarm had cleared when the sixty gallon alarm had not. It was determined that the piping for the sixty gallon alarm took longer to drain. It is the inspector's view that the operators should be more cognizant of all plant conditions.

The second occurrence was a high pressure scram on May 16, 1982, while the licensee was attempting to take the plant to hot standby. The licensee was at 800 psig and 1% power when the turbine had to be isolated and the MSIVs shut due to a loss of turbine turning gear lube oil. As a result, water level and pressure began to increase. At 55 inches HPCI and Reactor Core Isolation Cooling (RCIC) were automatically locked out as designed which prevented the licensee from using them for pressure control. An attempt was made to drain through Reactor Water Cleanup (RWCU) but due to delays in lining the system up and the piping size this was not effective. Reactor pressure continued to increase until an automatic scram occurred at 1035 psig. Procedure IPOI, Section III, Reactor Scram, Item A, states in part, "The conditions and setpoints (Limiting Safety System Settings) which should cause an automatic scram by the Reactor Protection System (RPS) are listed in attached table. If any of these conditions are discovered to exist, or it is evident that an automatic scram is unavoidable, the reactor should be manually scrammed." Discussions with the operators revealed that they knew the plant would reach 1035 psig and would automatically scram. It is the inspector's opinion that an RPS function should not be challenged in this fashion and that the recommended procedural action (i.e., reactor should be manually scrammed) is correct. However, the lack of required (shall instead of should) operator actions need to be reviewed and corrected in order to provide operators with clear and positive action guidelines in all operating procedures. Again, after this event the licensee did not evaluate the event for causes, corrective actions, or lessons learned in a prompt and effective manner. The licensee did not investigate the rapid rise in water level until questioned by the inspector.

The third instance occurred on April 4, 1982, while shutdown. The licensee removed Jumper 82-146 from the Cardox system but the clearance form for Jumper 82-135 bypassing the APRM flow comparator rod block was inadvertently signed off instead of the Cardox clearance form; however, the index of the jumper and lifted lead log was correctly updated to show removal of the cordox jumper. Subsequent to a plant startup, the jumper and lifted lead index was reviewed to ensure there were no outstanding jumpers. The shift supervisor performing the review called in an instrument technician to remove the APRM jumpers when he found the index not being signed off as cleared; however, before the technician took action the shift supervisor found the clearance form for the APRM signed off. He then signed off the index and informed the instrument technician there was not a problem. As a result of this administrative error, the plant was started up and operated for several hours before an instrument technician found by chance the APRM jumper still installed and informed the shift supervisor of it. The flow comparator rod block was the only function bypassed or affected. This function is not required to be operable by the technical specifications and the FSAR indicates it is not required for safe operation. Procedure ACP 1404.6, "Jumper and Lifted Lead Control," Section 6.1.5 states, "The qualified personnel verifying the removal of a jumper or lifted lead clearance shall sign in the removal verification space." Contrary to the above, the APRM jumpers were signed off as being removed without proper verification. This is an item of noncompliance (50-331/82-03-01).

No other items of noncompliance or deviations were identified.

4. Monthly Maintenance Observation

Station maintenance activities of safety related systems and components listed below were observed/reviewed 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. The following maintenance activities were observed/reviewed:

Diesel Generator Bearing Inspection
Control Rod Drive 26-15 Inspection
Recirculation Riser J-4 Inspection

On April 16, 1982, during performance of a Surveillance Test Procedure, an operator noted that the solenoid for Control Valves 1965 and 2035 were not de-energizing as required on one step. Investigation by the licensee revealed that the control switch for the valves was wired incorrectly. The switch had been modified by Design Change 953 to ensure that positive operator action would be required to re-open the valves and re-initiate RHR steam condensing following an accident condition when the system had isolated on high drywell pressure or low reactor water level. The control switch was wired such that by placing the control switch to the closed position the relay to energize the control valve solenoid would energize allowing the valves to be opened by adjusting the flow controller. The system is not required by technical specifications or the FSAR. The intended function of the system was not degraded and the system would isolate when required.

As a result of the review of this event the inspector has the following concerns:

- a. There was a breakdown in the review of the design change package in that:
 - (1) Two wires listed to be installed as part of the design package were already in place and drawings in the package clearly showed this.
 - (2) The reviews of the package by QA and the Safety Review Committee should have indentified this deficiency.
- b. There was a breakdown in the installation and Quality Control Verification because the control switch was wired incorrectly and QA verified that it was installed correctly.
- c. Testing of the control switch did not thoroughly test each function of the switch.

These occurrences appear to draw into question the effectiveness of the corrective actions delineated by the licensee responses to Inspection Reports No. 50-331/80-23 and 50-331/81-12. This is an open item (50-331/82-03-02).

No items of noncompliance or deviations were identified.

5. Surveillance Observation

The inspector observed technical specifications required surveillance testing on the HPCI, ADS, AND LPCI 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 Report Followup

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

79-21/01-1	Closed	RHR Minimum Flow Valve Inoperable
80-42/03-0	Closed	Containment Spray Pressure Switch out of Calibration.
80-54/01-1	Closed	Relief Valve 4405 Would Not Close. Pilot disc, second state disc and liner were replaced. Valve was tested satisfactorily.
80-56/03-0	Closed	Containment Spray Permissive out of Calibration.
80-61/03-0	Closed	Torus Water Level Recorder In-Operable.
80-65/03-0	Closed	Suppression Chamber Purge Valve Inoperable. New procedure written requiring semi-annual cleaning and inspection of the RHR Service Water Strainers.
81-13/01-1-0	Closed	MSIV LLRT Failure. Valves were repaired and tested satisfactorily. Failure attributed to normal wear.
81-30/03-0	Closed	Torus Sampling Valve Inoperable. Rust in the solenoid valve 8108A caused it not to shut. Valve and other similar valves were cleaned and tested satisfactorily.
81-40/01-0	Closed	RWCU Return Valve Inoperable.
81-42/03-0	Closed	Rod 26-15 Uncoupled. Rod was recoupled. Failure caused by improper seating of liner. Rod will only be withdrawn to 46" and repaired in the 1982 outage.
81-43/01-0	Closed	24VDC Charger Output Low.
81-44/03-0	Closed	Secondary Containment Damper Inoperable. Dampers were reinstalled correctly and repair procedures were revised to reflect correct installation procedures.

81-45/03-0	Closed	Control Building Damper IV-AD-31A Failure. Damper repair procedure was inadequate resulting in misalignment and failure of the damper. Procedure has been corrected.
81-46/03-0	Closed	Control Building Damper IV-AD-31A Failure. Damper repair procedure was inadequate resulting in misalignment and failure of the damper. Procedure has been corrected.
81-47/03-0	Closed	High Drywell Pressure Switch out of Calibration.
81-48/03-0	Closed	Reactor Building Pressure Switch out of Calibration.
81-49/03-0	Closed	Torus Level Recorders out of Service.
82-16/03-0	Closed	Standby Filter Unit Inoperable.

No items of noncompliance or deviations were identified.

7. Plant Trips

Following the plant trips on April 4 and May 16, 1982 the inspector ascertained the status of the reactor and safety systems by observation of control room indicators and discussions with licensee personnel concerning plant parameters, emergency system status and reactor coolant chemistry. The inspector verified the establishment of proper communications and reviewed the corrective actions taken by the licensee.

On each occasion all systems responded as expected, and the plant was returned to service. However, on recovery from the May 16 trip, the inboard MSIVs were opened with an 850 psi differential pressure across them resulting in damage to the actuator assemblies. This was not discovered until June 4 and will be addressed in IE Inspection Report 50-331/82-07.

No items of noncompliance or deviations were identified.

8. IE Circular Followup

The inspector attempted to review licensee action on outstanding circulars and determined a number of them from 1981 forward are still open and circulars 80-10 and 80-12 are still open. Technical Engineering did not know the current status of many of the circulars and does not formally followup the circulars that are assigned outside its department. Corporate engineering also did not formally track or assign circulars for action as received but as time permitted.

These matters were discussed with the licensee. The licensee designated specific personnel in the engineering department to evaluate IE Bulletins, Circulars and Information Notices, INPO items, GE SILs and SERs. The Licensing Department now formally tracks the items and target completion

dates to ensure timely resolution. The Technical Engineering Department is attempting to increase their staff size to ensure they can adequately track and resolve their assigned items.

No items of noncompliance or deviations were identified.

9. Test and Measurement Equipment Program

The inspector verified the licensee has implemented a program to control the use and calibration of test and measurement equipment. These include controls to: assign criteria for calibration frequency; maintain equipment inventory listing calibration frequency, standards and procedures to be used; ensure equipment is calibrated and marked before its due date; segregate out of calibration or past due date equipment to ensure it is not used; and evaluate acceptability of items tested or measured by equipment out of calibration.

No items of noncompliance or deviations were identified.

10. Surveillance Testing and Calibration Control

The inspector verified the licensee has implemented a program to control surveillance testing, calibration and inservice inspection as required by technical specifications and by 10 CFR 50.55a and of calibration of safety related items not specifically controlled by technical specifications. The inspector determined the licensee has a formal program which includes: a master schedule to determine frequency, responsible organization, and test status; a surveillance coordinator; and formal requirements for performance of tests and evaluations of them.

No items of noncompliance or deviations were identified.

11. 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.