Iowa Electric Light and Power Company January 19, 1981 LDR-81-29

LARRY D. ROOT ASSISTANT VICE PRESIDENT OF NUCLEAR DIVISION

> Mr. James G. Keppler, Director Office of Inspection and Enforcement U.S. Nuclear Regulatory Commission Region III 799 Roosevelt Road Glen Ellyn, IL 60137

> > Re: Duane Arnold Energy Center Subject: Response to Inspection Report 80-23 File: A-102, NRC-4, Inspection Report 80-23

Dear Mr. Keppler:

This letter is in response to your letter concerning an inspection of activities at the Duane Arnold Energy Center conducted on November 10-26, 1980. The following responses indicate the actions which have been taken to correct items of noncompliance noted in the subject report.

Noncompliance 1

Technical Specification 3.7.D.2 states "In the event any isolation valve specified in Table 3.7.3 becomes inoperable, reactor power operation may continue provided at least one valve in each line having an operable valve shall be in the mode corresponding to the isolated condition."

Contrary to the above, the Primary Containment Isolation System, Group 3, logic A valves were inoperable on a reactor low water level signal from April to November 10, 1980, and at least one valve in each line was not maintained in the isolated condition thereby exceeding the Technical Specification limiting condition for operation.

Response

1. Admission or denial of the alleged item of noncompliance:

1

The train "A", Group 3 isolation valves were inoperable in that closure would not initiate automatically in response to a reactor low water level signal. This was due to a wiring error made while completing an electrical design change during the 1980 refueling outage. As noted on page 4 of the Inspection Report, DAEC personnel were unaware of the wiring error which rendered the train "A", Group 3 isolation logic inoperable on a reactor low water level signal. Consequently, the LCO stated in DAEC Technical Specification 3.7.D.2 was unknowingly exceeded.

8102180874

FJAN 2 2 1981

Mr. James G. Keppler LDR-81-29 Page two

2. Reasons for the item of noncompliance:

The post-installation testing performed subsequent to the electrical design changes made to the Group 3 isolation wiring circuit did not reveal the wiring error. Since DAEC was unaware of this train "A", Group 3 wiring problem, at least one valve in each line was not maintained in the isolated condition thereby exceeding the Technical Specification limiting condition for operation.

3. Corrective steps which have been taken and the results achieved:

The wiring error was corrected and the train "A", Group 3 isolation logic was verified to operate properly. A special task force was established on November 12, 1980 to study all of the DAEC design change work scheduled/implemented since the beginning of the 1980 refueling outage. The emphasis of the review was placed on the post-installation testing program and the plant system operability surveillance testing program adequacy. In several instances, the post-installation testing was revised and reperformed, and testing procedures were revised as deemed necessary to adequately ensure the proper operation of plant electrical systems/components.

An administrative "Hold" was placed on plant restart until the review work was completed and any necessary corrective actions/retest work completed. On November 14, 1980, the task force review work was complete, all corrective actions had been completed, the administrative Hold was lifted, and the plant was readied for normal start-up.

Also, as an interim corrective measure to prevent recurrence of this type of problem, an administrative stop work order has been issued on all future safety-related design change implementation until a case by case determination has been made that adequate design change post-installation testing mechanisms are in place. The administrative stop work order has acted as an interim control mechanism to ensure that post-installation testing is properly addressed for each safety-related design change implementated at DAEC.

4. Corrective steps which will be taken to avoid further items of noncompliance:

The noncompliance has been attributed to possible weaknesses in the DAEC design change post-installation testing program. In order to strengthen the testing program and more effectively process the large number of design changes scheduled for implementation during the 1981 DAEC refueling outage, changes are being developed to the DAEC testing program which will include the following. Testing requirements, including acceptance criteria, will be originated by the organization preparing a design change. A separate testing review group will review the results of testing. This review

Mr. James G. Keppler LDR-81-28 Page three

> will include checking to assure that the tests are adequate, as well as assuring that they have been completed as prescribed. This will ensure that post-installation testing is systematically and rigorously addressed for all DAEC design changes and that the test procedures are prepared to ensure that the required testing is performed.

5. Date when full compliance will be achieved:

Full compliance was achieved on November 10, 1980 when the plant tripped and at least one isolation valve on each line closed and was maintained in the closed position. Prior to plant restart, the wiring problem which caused the noncompliance was corrected and the train "A", Group 3 isolation logic was verified to be fully functional.

Noncompliance 2



10 CFR 50, Appendix B, Criterion X requires that "a program for inspection of activities affecting quality shall be established and executed" and that "examination, measurements, or tests of material or products processed shall be performed for each operation where necessary to assure quality." The Duane Arnold Energy Center Administrative Control Procedure, ACP 1405.6, Sections 5.1 and 5.1.1 states "the QC Supervisor shall determine the operations and characteristics of the activities to be inspected" and "inspections, examinations, measurements or tests of materials, products, or activities shall be performed where necessary to assure quality."

Contrary to the above, the safety related work and testing involved in the containment isolation logic modification were not inspected.

Response

1. Admission or denial of the alleged item of noncompliance:

The design modification work during the refueling outage which resulted in the wiring error and subsequent November 10, 1980 failure of the train "A", Group 3 isolation logic was not inspected by QC personnel. The DAEC QC personnel conducted a review of the affected design change documentation package prior to implementation during the 1980 refueling outage. This review concluded that the post-installation testing specified in the design change documentation package would be sufficient to verify functional operability of the modified electrical circuitry and that no visual QC inspection was required. However, the November 10, 1980 failure revealed that the post-installation testing and subsequent functional STPs performed were not adequate to uncover the wiring error. Thus, it must be concluded that DAEC was not in compliance with 10 CFR 50, Appendix B, Criterion X or DAEC Administrative Control Procedure (ACP) 1405.6.



Mr. James G. Keppler LDR-81-29 Page four

- 2. Reasons for the noncompliance:
- QC department personnel incorrectly assumed that the post-installation testing specified in the design change documentation package would adequately demonstrate that the design change was properly implemented and would reveal any errors made during the installation process. The November 10, 1980 failure and subsequent investigation determined that the testing was inadequate to reveal the wiring error. The containment isolation logic modification work was safety related. As such, it should have been tested and inspected in order to assure conformance to design requirements.
- 3. Corrective steps which have been taken and the results achieved:

The QC group has been reinstructed regarding their function in the review, performance and acceptance process for all work activities at the DAEC. The Corporate Quality Assurance Department, which includes the DAEC Quality Control Group, is implementing a review of Quality Assurance Directive 1311.2, "Plant Test Control"; ACP 1401.4, "Control of Plant Work", ACP 1408.3, "Surveillance Program", and ACP 1408.4, "Special Test Procedures". The purpose of this review is to: 1) assure compliance with 10 CFR 50 Appendix B, Criterion X, "Inspection" and XI, "Test Control"; 2) assure that sufficient programmatic intrastructure is present to adequately control the independent testing group discussed above; 3) recommend any programmatic changes necessary to prevent or mitigate a repetition of the wiring error incident and to support the independent testing review group concept.

4. Corrective steps which will be taken to avoid further items of noncompliance:

Item 4 of the response to Noncompliance 1 discusses the implementation of an independent testing review group to be responsible for review of postinstallation testing of design changes. The DAEC Quality Control group will participate in testing review. The purpose of their participation will include: Review of test procedures for compliance with engineering test specification quality requirements; review of test procedures for inclusion of inspection hold/witness points; surveillance of postinstallation testing; review and acceptance of test data for conformance to procedure acceptance criteria and completion of specified procedure requirements.

5. Date when full compliance will be achieved:

Compliance with interim measures was achieved on November 14, 1980, with QC department participation in the evaluation and correction of the wiring error and completion of additional design change post-installation testing. Further details for compliance are provided in our responses to Noncompliances 1 and 3.

Noncompliance 3

LDR-81-29 Page five

Mr. James G. Keppler

10 CFR 50, Appendix B, Criterion XI requires "that all testing required to demonstrate that structures, systems and components will perform satisfactorily in service is identified and performed in accordance with written test procedures." DAEC procedure QAP 1303.1, Section 5.4.1.1 states that "specific work procedures for ... testing shall be developed."

Contrary to the above, specific post modification testing of the reactor low water level containment isolation trip logic was not developed and the logic testing was not performed.

Response

1. Admission or denial of the alleged item of noncompliance:



The appropriate DAEC Surveillance Test Procedure (STP) was revised April 15, 1989 in order to functionally test the Primary Containment Isolation System (PCIS) logic and functionally verify the correct completion of the electrical design changes made to the PCIS logic during the 1981 refueling outage. However, as revealed by the November 10, 1980 train "A", Group 3 isolation failure on reactor low water level signal and subsequent detailed review of the design change testing documentation, the post-installation testing and subsequent STP work was inadequate for acceptance testing of the modifications and did not reveal the train "A", Group 3 isolation logic wiring problem. Thus, DAEC was unknowingly in noncompliance with the QAP 1303.1 Section 5.4.1.1 which implements 10 CFR 50, Appendix B, Criterion XI.

2. Reasons for the item of noncompliance:

This item of noncompliance occurred as a result of weaknesses in the DAEC design change post-installation testing program.

3. Corrective steps which have been taken and the results achieved:

The wiring error was corrected immediately. The appropriate DAEC STP was revised to functionally test the PCIS Logic System (including the train "A", Group 3 isolation on low reactor water level circuitry which had failed). The STP was completed on November 13, 1980, and all affected circuitry was determined to be fully functional prior to plant start-up.

As explained in the responses to Noncompliance items 1 and 2, discussed above, additional design review/post-installation work and testing was performed for DAEC design modifications performed during or subsequent to the 1980 refueling outage in order to verify that no similar errors existed. On November 14, 1980, this additional review work and testing was satisfactorily completed and the plant was readied for normal start-up. Mr. James G. Keppler LDR-81-29 Page six

4. Corrective steps which will be taken to avoid further items of noncompliance:

Additional measures taken at DAEC in order to prevent further similar items of noncompliance are discussed in our responses to Noncompliance items 1 and 2.

5. Date when full compliance will be achieved:

The wiring error was corrected and additional post-installation work, as discussed in our responses to Noncompliance items 1 and 2, was completed on November 14, 1980. Thus, full compliance was achieved on that date.

The additional comments made during the November 26, 1980 NRC/IELPC meeting at the NRC Region III office in Chicago will be incorporated prior to the beginning of the 1981 refueling outage presently scheduled for March, 1981.

This response is true and accurate to the best of my knowledge and belief.

IOWA ELECTRIC LIGHT AND POWER COMPANY

Farry D.

Larry D. Root Assistant Vice President Nuclear Generation

LDR/DWT/dw



Mr. James G. Keppler LDR-81-29 Page seven

1 1

Subscribed and sworn to before me on this $19^{t/t}$ day of <u>January</u>, 19<u>8/</u>.

Mary & Benfuld Notary Public in and For the State of Iowa



MARY E. BENFIELD My Commission Expires SEPTEMBER 30, 1983

Director, Office of Inspection and Enforcement cc: U.S. Nuclear Regulatory Commission Washington, DC 20555

- D. Tooker
- D. Arnold
- L. Liu
- S. Tuthill
- R. McGaughy
- K. Meyer
- D. Mineck
- J. Van Sickel

NRC Resident Office