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RECIP. NAME RECIPIENT AFFILIATION
DAVIS, A. B. Region 3, Ofc of the Director

SUBJECT: Responds to items of concern noted in Insp Rept 50-331/87-25 re weakness in util design control program. Based on review & improvements noted in encl, util considers potential weakness corrected.

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Iowa Electric Light and Power Company
November 9, 1987
NG-87-3954

Mr. A. Bert Davis
Regional Administrator
U.S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License No: DPR-49
Response to Items of Concern Stated in
NRC Letter, Dated October 5, 1987,
Transmitting Inspection Report 87-025
File: A-102, A-103

Dear Mr. Miller:

This letter and attachment are provided in response to a potential weakness in Iowa Electric's design control program. We have investigated this matter and a summary of the actions taken is provided in the attachment. The four items listed in your letter transmitted with Inspection Report 87-025 are specifically addressed. Based on this review and the improvements we have made to the design control program, we consider the potential weakness to be corrected.

If you have any questions with regard to this response, please feel free to contact me.

Very truly yours,

William C. Rothert
Manager, Nuclear Division

WCN/JPR/go

Attachment: Response to Items of Concern Stated in NRC Letter, Dated October 15, 1987, Transmitting Inspection Report 87-025

cc: U.S. NRC Document Control Desk (Original)
L. Liu
L. Root
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NRC Resident Inspector - DAEC
Commitment Control #870284

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Iowa Electric Light and Power Company
Response to Items of Concern Stated in NRC Letter,
Dated October 5, 1987, Transmitting Inspection Report 87-025

The Rod Worth Minimizer design change package was designated as a Quality Level IV (nonsafety-related) package. The package specified the use of class 1E (safety- related) computer cables. After the package was released for construction, it was learned 1E computer cables were not available; therefore non-1E computer cables were procured. Documentation which justified the use of the non-1E computer cable was not provided until after a construction engineer voiced concern.

Since the implementation of the Rod Worth Minimizer design modification, improvements to the Design Control and Quality Assurance Review programs have been made which will minimize the potential for recurrence of this situation. These improvements are discussed further in response to items three (3) and four (4) below.

NRC Item of Concern 1

Experience and qualifications of the involved engineers.

Response to Item 1

The following engineers were involved in the Rod Worth Minimizer design change package (DCP-1338). The experience and qualifications of each are summarized.

1. Responsible Design Engineer

   Education: Attended St. Petersburg Junior College
   Aircraft Electrician and Instrument Technician, Military Trade School

   Experience Summary:
   5 years - Design Engineer - Nuclear
   2 years - Group Leader - Nuclear
   2 years - Systems Group Leader - Fossil
   1 year - Senior Engineer - Electrical
   3 years - Control Systems Design Engineer
   4 years - Computer Systems Design Engineer
   20 years - Designer, instrumentation for aviation and aerospace technology applications

2. Lead Engineer

   Education: June 1977, The University of Florida, Gainesville, Florida.
   Bachelor of Science (BS) in Nuclear Engineering

   June 1981, The University of Florida, Gainesville, Florida.
   Master of Engineering in Electrical Engineering (System Theory, Communications, and Control Systems).

1982 - 1983, The University of Tennessee, Knoxville, Tennessee. Graduate courses related to computer image processing and pattern recognition.

1978 - 1979, The University of North Carolina, Wilmington, North Carolina. Business curriculum.

1978, Honeywell Process Computer School, Phoenix, Arizona.

Experience Summary: 4 years - Lead Engineer - Nuclear
2 years - Electrical/Computer Systems Engineer
2 years - Teaching Assistant, Electronics Laboratory
2 years - Station Nuclear/Computer Engineer

3. Contract Administrator

Education: BS Electrical Engineering, Michigan Technological University.

Experience Summary: 1 year - Construction Engineer - Nuclear
3 years - Shift Test Engineer - Nuclear Navy Submarine
2 years - Electrical Test Engineer - Nuclear Navy Submarine

4. Responsible Construction Engineer

Education: BS Electrical Engineering, University of Washington

Experience Summary: 5 years - Senior Construction Electrical Engineer - Nuclear
4 years - Senior Design Electrical Engineer - Nuclear
6 years - Graduate Electrical Engineer
2 years - Co-op Electrical Engineer

The Responsible Design Engineer and Lead Engineer were responsible for the design content of the Rod Worth Minimizer modification which was designated as a Quality Level IV (nonsafety-related) package. All personnel involved in the design change met the general qualifications in ANSI/ASN-3.1-1978 and ANSI N18.1-1971. Based on our review, we have concluded the experience and qualifications of the personnel involved in the Rod Worth Minimizer DCP were satisfactory.

NRC Item of Concern 2

Review of nonsafety and safety-related design changes engineered by these engineers.

Response to Item 2

Summaries of all other DCPs in which the Responsible Design Engineer and Lead Engineer participated are provided below. These packages were designated as Quality Level I (safety-related) or II (nonsafety-related). An independent design verification is required for Quality Level I and II packages and was satisfactorily performed. Our review of each package was focused on determining if it involved an electrical interface between safety and non-safety related systems to determine if mistakes or substandard engineering may have occurred in the interfaces. The results of our review found that the design and documentation of the packages were satisfactory.

1. DCP 1261 (Quality Level I)

   The Safety Parameter Display System (SPDS) was installed to respond to NUREG 0661 and 0737 and was required to meet all of the applicable codes relating to separation and isolation. Based on that requirement the SPDS was installed using a Data Acquisition System (DAS) which was qualified to the applicable codes in the area of electrical isolation. All of the 1E signals were routed to the qualified DAS cabinets to insure that proper isolation was maintained. The system utilized only 1E cable for field wiring.

2. DCP 1263 (Quality Level II)

   There were no electrical interfaces between 1E and non-1E signals, with the exception of a power supply to a DAS cabinet in the Intake Structure. In that case, proper isolation according to the applicable codes was provided. Only 1E cables were used for field wiring.

3. DCP 1264 (Quality Level II)

   The DCP provided interfaces between several computers which are not safety related. There were no electrical interfaces between 1E and non-1E signals.

4. DCP 1265 (Quality Level II)

   The package was prepared to install a ductbank from the Intake Structure to the Meteorological Tower to run data cables to an electronics cabinet at the Intake Structure. There was no requirement for electrical isolation.

5. DCP 1266 (Quality Level II)

   The package was prepared to install the instrumentation on the Meteorological Tower and connect the signals to a remote DAS at the Intake Structure. There was no interface between 1E and non-1E signals in the package. Only 1E cables were used for field wiring.

NRC Item of Concern 3

Programmatic controls on design changes that affect safety systems.

Response to Item 3

The Rod Worth Minimizer DCP was developed as a Quality Level IV package and reviewed in accordance with Utility Engineering procedures. It was approved by the Manager of Utility Engineering as those procedures required. The design control program at the Duane Arnold Energy Center (DAEC) has since been changed to require that all design changes be controlled by the Design Engineering Organization and be approved by the Manager of Design Engineering. This process improves the overall review of design changes as it uses the nuclear power plant design experience of the Design Engineering Organization to ensure that all DCPs are consistently reviewed. The Design Engineering review process utilizes personnel with expertise in pertinent areas to ensure 1) interfaces between safety-related and nonsafety-related systems are identified and assigned the appropriate Quality Level, 2) documentation or design discrepancies are identified and corrected before a DCP is released for construction, and 3) procurement discrepancies are resolved before potentially unqualified equipment is utilized.

NRC Item of Concern 4

Quality Assurance/Quality Control involvement.

Response to Item 4

The Rod Worth Minimizer DCP was reviewed by the Quality Assurance Department in accordance with Quality Assurance Procedures (QAP 1103.1, Rev 2). Since the change was nonsafety-related, the review was limited to a confirmation that the correct quality level (QL-IV) had been assigned to the package and that the appropriate reviews and approvals had been conducted and documented by signature. Based on our review, we have concluded the Quality Assurance review of the Rod Worth Minimizer DCP was satisfactory.

The Quality Assurance Department is now, for other reasons, improving the procedures used in the review of Design Change Packages. Quality Engineering Instruction 2102.1, Rev. 0 is in its final concurrence review. This new instruction specifically requires the reviewer to examine each Quality Level IV package for interfaces with structures, systems, or components of a different quality level.

With regard to design changes, the Quality Control (QC) Department is responsible for verifying that the Engineering Acceptance Requirements (EARs) have been met. This includes performing or witnessing inspections, examinations, and tests required to prove that the design requirements have been satisfied. Based on our review, we have concluded the function of the QC department was performed satisfactorily for the Rod Worth Minimizer design change.