

Iowa Electric Light and Power Company

February 28, 1986
NG-86-0744

Mr. James G. Keppler
Regional Administrator
Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

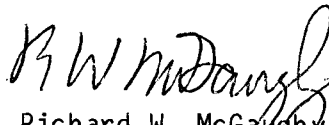
Subject: Duane Arnold Energy Center
Docket No. 50-331
Op. License DPR-49
Response to NRC Inspection Report 85-036

File: A-102, NRC-4

Dear Mr. Keppler:

This letter is provided in response to the subject special safety inspection of activities at the Duane Arnold Energy Center on December 9, 1985 through January 10, 1986. Attachment 1 provides our response in accordance with your request.

Very truly yours,



Richard W. McGaughy
Manager, Nuclear Division

RWM/JCS/pc

Attachments: Response to Inspection Report 85-036

cc: L. Liu
L. Root
M. Thadani
NRC Resident Inspector
Commitment Control No. 860070

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Response to IR 85-036

Attachment 1

NRC Conclusions and Recommendations

The inspectors concluded that the Duane Arnold Energy Center HPCI/RCIC Reliability task force had identified several methods to improve HPCI and RCIC reliability. The inspectors referred to an increase in HPCI reliability as indicative of the plant's effectiveness in this regard. However, the inspectors' overall assessment was that additional attention is required in several areas. Accordingly, the inspectors felt that consideration should be given to the following recommendations:

1. Place increased emphasis on the determination of the root causes of events and equipment malfunctions [Paragraphs 2c(1)(a), (b), and (c); 2c(2)(b); and 2c(4)(b)].
2. Increase management attention relative to required engineering reviews [Paragraphs 2c(3)(a) and (b) and 2c(2)(c)].
3. Investigate the obvious trends apparent in the Deviation Report Listing [Paragraph 2c(2)(a)].
4. Reduce the excessive use of cause codes unknown and "other" [Paragraphs 2c(1)(c) and 2c(2)(b)].
5. Give increased attention to manufacturers/vendors recommendations for reliability [Paragraph 2c(5)(a) and (b)].
6. Implement the planned maintenance history and trending program as soon as practicable [Paragraph 2c(4)(a)].
7. Rewrite Procedure No. GPM-007 to reflect current maintenance practices and train the personnel in its implementation [Paragraph 2c(7)(b)].
8. Include valve packing inspections and limit torque switch settings in the PM program [Paragraph 2c(6)(b)].
9. Establish training objectives, a training schedule, and training program for continuing training for journeyman level and supervisory maintenance personnel [Paragraphs 2c(8)(c) and (d)].
10. Strengthen the corrective maintenance procedure relative to root cause determination and documentation and train the responsible personnel in its implementation [Paragraphs 2c(7)(d)].
11. Include more QC or peer type inspections on LCO-related maintenance to ensure root cause determination [Paragraph 2c(7)(a)].
12. Investigate the practice of removing lantern rings from valves so equipped without an engineering evaluation and identify and generic implications [Paragraph 2c(7)(c)].

Response to Conclusions and Recommendations

Iowa Electric Light and Power recognizes that the areas identified above constitute important concerns which affect not only the HPCI and RCIC systems, but all areas of plant operations. Programs are in place or are being implemented to deal with the areas identified. Specific details of individual conclusions and recommendations are given below. Iowa Electric Light and Power appreciates the advice and technical counsel of the inspectors and highly values the assistance the inspectors provided to the plant staff in identifying means of improving the reliability of the HPCI and RCIC systems. The background information behind each recommendation and IE's response is given below:

1. The inspectors expressed concern that the root cause code "X" for "other" was used too often for component failures on the front page of Licensee Event Reports (LERs). They also noted that the analysis of event root causes within the text of LERs in some cases identified intermediate causes instead of root causes.

The inspectors also noted that cause codes such as "unknown" or "instrument drift" were used excessively in evaluating internal plant Deviation Reports (DRs). Root causes were also not always identified with maintenance data packages.

Response:

Personnel responsible for preparation of LERs have contacted and consulted with NRC Region III personnel for guidance on the accepted use of component failure codes used in LERs. That guidance (consisting of more detailed criteria than that furnished in NUREG 1022) will be used in future DAEC LERs.

The LERs to which the inspectors referred (using improper written root cause analysis in the texts) were submitted prior to the issuance of NUREG 1022, Supplement 2. Supplement 2 was issued in 1985 as a review of LERs received by the NRC since January 1, 1984. The Supplement discussed style and required content. This Supplement also contained additional guidance on what constitutes "intermediate" causes and "root" causes. Since receipt of the Supplement, this guidance has been applied.

Similarly, internal Deviation Report evaluations have received enhanced attention on proper identification of root causes. The same criteria used in preparing LERs are applied in determining root causes of DR evaluations.

The Corrective Maintenance Action Request (CMAR) program has been recently revised to improve the means of determining root cause (see also the response to Inspection Report 85-032). To summarize the improvements, the worker(s) performing the CMAR is required to document on the CMAR form work completion details, which include what he/she feels is the root cause for the equipment problem. This information is reviewed by a Maintenance Engineer. If the Maintenance Engineer is not satisfied with the root cause determination,

he/she will require further information from the worker(s) before signing off the CMAR. Problems with Technical Specification equipment are reported on Deviation Reports. In these cases, the root cause determination contained in the CMAR will also be reviewed by the Technical Support Engineering staff while completing the DR evaluation.

Additionally, instruction will be provided to appropriate Maintenance Department Engineering and other appropriate personnel on proper methods for determining root causes. This training will be conducted by March 31, 1986.

2. The inspectors observed that engineering reviews of HPCI/RCIC equipment problems were not always complete. One review in response to a Quality Control (QC) Nonconformance Report was not complete at the time of the NRC Inspection and another review was not complete in its analysis of the effect of the problem on equipment operability.

The inspectors also observed that management review and full closeout of Deviation Reports was not always timely. They were concerned that this delay could preclude the potential benefits of prompt and effective corrective actions.

Response:

Design Engineering has made and is currently making improvements in staff stability, with less reliance on short term contractors. Recent training has enhanced the emphasis on thorough, complete and timely reviews. Additionally, this subject has been discussed in a Design Engineering Department meeting, using the reviews identified by the inspectors as examples. Since the reviews identified by the inspectors were initiated, Design Engineering has improved their work tracking program with a commitment list which will more efficiently track open engineering reviews.

With regard to QC Nonconformance Reports, currently NCRs are not approved for QC closure unless all supporting documents referred to in an engineering evaluation are included. QC also reviews the adequacy of the evaluation and supporting documents before approving the NCR. QC procedures will be revised by March 31, 1986 to provide additional assurance in this area.

Management attention is being directed towards shortening the DR evaluation and formal review period. Presently, formal management review of DR evaluations is usually completed within weeks after the evaluation is completed by Technical Support. The Technical Support Engineering Group, which is responsible for evaluation of Deviation Reports, is currently increasing its staff size in order to provide more timely written evaluation of DRs. When this staff augmentation is complete, a goal will be to evaluate Deviation Reports within 60 days of DR issuance.

The DR formal evaluation system is an administrative system separate from the mechanism to deal promptly with significant safety and equipment problems. Current plant practices ensure that corrective actions are initiated in most cases before complete formal management review. The Technical Support staff reviews Deviation Reports as they arrive in the department (usually within a

few days). The Technical Support Supervisor and Management, as circumstances warrant, are notified sooner by phone by the Operations Shift Supervisor. Management and the Technical Support staff will then determine if immediate corrective actions are warranted before a written evaluation is performed. Additionally, appropriate corrective actions identified by the DR review and evaluation are initiated independent of routine management review of DR evaluations.

3. The inspectors noted that information available to assist in trending and problem evaluation is not always used. The inspectors felt that several obvious trends in the failure mode of instrumentation and pressure switches had neither been recognized nor investigated.

Response:

The instrumentation (particularly pressure differential switches) identified by the inspectors are used in the HPCI and RCIC Steam Leak Detection System and have been subject to repeated instrument drift. These switches are of broader range than is ideal for their application. So the specified setpoint tolerances are difficult to maintain. Past engineering studies have been unsuccessful in finding suitable qualified replacements. Further studies were initiated for the pressure switches and were underway at the time of the inspection to increase the setpoint tolerance. The HPCI/RCIC task force has since initiated another Engineering Work Request to look for alternate technologies to perform the instrumentation's functions more reliably. This Engineering Work Request will be evaluated by June 1, 1986.

Recent Deviation Report evaluations have identified significant trends of similar failures and have recommended corrective action where clear trends are present. A procedure change has been initiated to increase the emphasis on trends in DR evaluations. Additionally, trending activities are being integrated within the Corrective Maintenance Action Request (CMAR) program, as detailed in the response to NRC Inspection Report 85-032 and summarized under recommendation 6 below.

4. This reference to the excessive use of the component failure cause code "unknown" and "other" was also referenced in recommendation No. 1.

In addition to the response to recommendation No. 1, DAEC has recently increased the emphasis on the determination of root causes for equipment problems. Personnel who initiate DRs are required to specify a suspected root cause. Since the DR is initiated before corrective maintenance is performed, the root cause "unknown" many times must be indicated because adequate information is not yet available. However, Maintenance and Technical Support personnel determine, to the extent practical, the root cause before the CMAR is approved for closure or the DR evaluation is completed. This final determination is addressed in the completed CMAR and in the DR evaluation.

5. In reviewing GE Service Information Letters (SILs), the inspectors noted that SIL 31 (Warm-up of HPCI and/or RCIC Steam Supply Lines) and SIL 336 (Surveillance Testing Recommendations for HPCI and RCIC Systems) had been previously evaluated and partially implemented; however, more work was being considered during the term of the inspection. Additionally, SIL 377 (RCIC Startup Transient Improvement with Steam Bypass) and SIL 382 (Removal of RCIC Electronic Overspeed Trip) were being evaluated. The inspectors noted that there was no evidence of previous evaluation of the last two SILs.

Response:

At the time when these SILs were issued, DAEC did not uniformly perform written evaluations of SILs. As part of its study, the HPCI/RCIC Reliability task force has been conducting a comprehensive evaluation of all relevant SILs on HPCI and RCIC. The task force has found evidence that some SILs were implemented and referenced in procedures or other documents. Other cases were found when SILs appeared to be complied with or implemented (such as SIL 31), but no documentation could be traced back to the SIL. No written evaluation of SIL 377 could be found, nor was it implemented. SILs 336 and 382 had been previously evaluated and the conclusion was made that only portions should be implemented. The task force has decided that reevaluation is warranted. This reevaluation will be completed by June 1, 1986.

Even when SILs have been implemented or otherwise evaluated, retrievable historic documentation is often weak. DAEC recognizes that formal and traceable review of SILs and other vendor documents could have a positive impact on equipment reliability. As such, Maintenance Engineering has improved traceability, timeliness of review, and records of vendor documents. Specifically, written evaluations are being performed of significant vendor documents and completion of these evaluations is tracked by our administrative work tracking system.

6. The inspectors noted that the planned maintenance history program had not been implemented to identify adverse trends and potential problems.

As detailed in the response to NRC Inspection Report 85-032, the following is the schedule for full implementation of the DAEC maintenance history system which will be incorporated into the present Computerized History and Maintenance Planning System (CHAMPS). Development of this system at DAEC began in 1983. The Material Management Information System (MMIS) data base has been incorporated. Trending associated with this data base will realize improvements for maintaining replacement part inventories. Component record files are in place in support of the Nuclear Plant Reliability Data System (NPRDS). Reporting of equipment failures associated with this data base are ongoing. A backfit of failure historic records to January 1, 1984 will be completed by July, 1986.

The Deviation Reporting (DR) data base contains records of Technical Specification related equipment problems since the commencement of commercial operation. This data, with cross references to associated maintenance

activities, is currently available from another computer system. Transfer of this data base to the CHAMPS system will be completed by September, 1986. Transfer of the existing CMAR data base (for the past 3 years already in another data base) has been transferred to the IBM computer equipment to be included with current maintenance activities. The data has been entered into the computer and is available in individual data files. Additional software development, needed to make the data available as part of the online CHAMPS system, will be completed in March.* In cooperation with Oak Ridge National Laboratory, approximately 8,000 maintenance history records related to safety related equipment will be loaded into CHAMPS by July, 1986. The refinement of computerized data records to include appropriate CMAR records not captured by the current history, Oak Ridge and Deviation Report data bases will commence in late 1986.

7. The inspectors noted that the instructions for adjusting the valve packing contained in Maintenance Action Request (MAR) 69480 described an alternative method not addressed in repair procedures. Consequently, they recommended that the alternative method be included in Maintenance Procedure GPM-007 and that personnel be trained accordingly.

Response:

The recommended revision to GPM-007 has been implemented and maintenance personnel have been trained accordingly.

8. The inspectors noted that there is no scheduled preventive maintenance for valve packing inspections and Limitorque torque switch settings or motor operator running current. They stated that this is not consistent with current industry practices.

Response:

DAEC has historically maintained data on torque switch settings. Recent Limitorque representative recommendations on preventive maintenance of torque switch spring packs (which may directly affect the performance of torque switches) have been under review. This review will be completed by March 31, 1986. DAEC recognizes the value of more complete testing of torque switch performance. As such, Iowa Electric is pursuing the incorporation of a testing program which will ensure that torque switches are properly performing their function. Further testing following Limitorque motor operator valve work this spring will expand baseline information on running and peak current draw of these motor operators.

* The delay from February 28, 1986, until March 1986 for CHAMPS access to this data reflects an update of status on this program element from that presented in our response to Inspection Report 85-032.

9. It was observed that the DAEC training program deals primarily in plant occurrences and industry related events. It does not provide for continuing training of journeymen mechanics in maintenance. There is also no training schedule for retraining or continuing training of journeymen mechanics.

Response:

As part of the INPO accreditation effort, the Training Department is currently developing the formal training program and schedule which will fulfill this recommendation. The program will be completed and implemented by January, 1987 for the identified class of personnel.

10. The inspectors observed that the new CMAR procedure, which was in draft form during the inspection (now implemented) appeared weak in the area of root cause analysis and determination.

Response:

The CMAR procedure and planned training have been strengthened in the area of root cause analysis and determination as detailed in the above response to recommendation No. 1.

11. The inspectors noted that Maintenance Action Request (MAR) 69480 for repacking of the HPCI outboard steam isolation valve required only a visual inspection of the valve stem when the valve had been repacked seven months previously. The valve has also placed the plant in an LCO condition due to the same packing leak. The inspectors concluded that direct measurement of the stem would have been appropriate since the cause of the failure was not determined and maintenance for the third time will be necessary.

Response:

The valve stem will be reinspected and measured for contributory cause during the March 1986 surveillance outage, when radiation levels and steam tunnel temperatures are more conducive to prolonged maintenance activities.

As a more general corrective measure, instructions to maintenance planners have been incorporated into the Administrative Control Procedure (ACP) for the new CMAR program. These instructions direct the maintenance planner to include peer review and inspections on CMARs when appropriate. Additionally, when a root cause determination is especially important or appears difficult, the maintenance planner can specify that removed parts be set aside to aid in a later determination. Discussions on the use of these processes will be covered during the training referred to in the response to recommendation No. 1.

12. During the maintenance activities on the HPCI outboard steam isolation valve, it was discovered that the stainless steel lantern ring had been removed in 1975 without an engineering evaluation. Engineering Work Request EWR 86-002 was initiated as a result of the NRC inspection and the inspectors found the resulting evaluation acceptable.

Response:

The administrative control mechanism and documentation under which changes of this nature have improved substantially since 1975. Under these controls, a formal design change, which includes an engineering evaluation, is required to perform activities of this nature.