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AUTH. NAME AUTHOR AFFILIATION
ROTHERT, W. C. Iowa Electric Light & Power Co.
RECIP. NAME RECIPIENT AFFILIATION
DAVIS, A. B. Region 3, Office of Director

SUBJECT: Responds to violations noted in Insp Rept 50-331/87-14. Corrective actions: Nuclear Generation Div Procedures 104.1, "Preparation, Review & Approval of Requisitions" & 104.9, "Acceptance of Items & Svcs" revised.

DISTRIBUTION CODE: IE01D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 9
TITLE: General (50 Dkt)-Insp Rept/Notice of Violation Response

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Iowa Electric Light and Power Company

August 20, 1987
NG-87-2879

Mr. A. Bert Davis
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 No: DPR-49
Response to NRC Inspection Report 87014
File: A-102, A-103

Dear Mr. Davis:

This letter is provided in response to the subject report concerning inspections of activities at the Duane Arnold Energy Center. We requested, and were granted, a one week extension to provide this response. Attachment 1 provides our response in accordance with 10 CFR 2.201.

Very truly yours,

William C. Rothert
Manager, Nuclear Division

WCR/DPB/pjv*

Attachments: 1. Response to IR 87014
2. License Event Report (LER) 87-008, Rev. 1.

cc: L. Liu
L. Root
R. McGaughy
A. Cappucci (NRC-NRR)
NRC Resident Inspector
Document Control Desk
Commitment Control 870168, 870169

IE01
1/1

IOWA ELECTRIC LIGHT AND POWER COMPANY
RESPONSE TO INSPECTION REPORT 87014

NRC Item of Violation No. 1 (Severity Level IV)

1. "10 CFR 50, Appendix B, Criterion III, as implemented by Section 17.2.3 of the Duane Arnold Operational QA program, requires that measures be established for the identification and control of design interfaces and for coordination among participating design organizations. These measures shall include the establishment of procedures among participating design organizations for the review, approval, release, distribution, and revision of documents involving design interfaces. Design control measures shall be applied to items such as delineation of acceptance criteria for inspections and tests.

Contrary to the above:

a. The licensee failed to establish measures which ensured that the participating design organizations delineated the acceptance criteria for critical quality characteristics to be verified upon receipt of an item.

b. The licensee failed to implement the portion of Procedure 1104.6, Revision 1, "Source Inspection," which would have required Engineering to delineate the specific attributes and characteristics to be inspected and their respective acceptance criteria.

c. Quality Assurance and Quality Control, who were not designated as participating design organizations, established the critical quality characteristic to be verified and their respective acceptance criteria for source and receipt inspections."

Response to Violation No. 1:

The following is a general summary of the corrective action taken with respect to this item. More information about the corrective action taken with respect to each item of the violation is presented below.

Several procedures have been revised and a new procedure has been issued. The net effect is to clarify the requirement that acceptance criteria for receipt and source inspections must be provided with or specified on the requisition and forwarded to Quality Assurance, and to specify the process for development of acceptance criteria for items and services used at the DAEC. As discussed in more detail below, these revisions and the new procedure have been issued and are now in effect.

Iowa Electric reviewed records of past safety-related procurements to determine if they contained objective evidence that the items met the required acceptance criteria. This review covered a random sample of receipt inspections and all 36 procurements for which a source inspection was required. This review identified the acceptance criteria applicable to each of these procurements and determined whether conformance to the acceptance criteria had been confirmed by

inspection or the procured items were otherwise shown to be acceptable. The review confirmed that with the exception of the two procurements identified in Licensee Event Report (LER) 87-008, all items within the scope of the review were acceptable.

Iowa Electric senior management had a review conducted of the circumstances described in LER 87-008 and NRC Inspection Report 87014 and in addition, an independent audit was done of the Iowa Electric vendor procurement program. Actions are in progress in response to the recommendations of the review and the audit. To ensure independence in this review and audit, outside consultants were used to work in conjunction with Iowa Electric personnel. In addition, in order to further improve the QA programs, Iowa Electric has initiated a Quality Enhancement Program (QEP). The QEP is a review of the Iowa Electric QA Manual and implementing procedures, practices and performance utilizing the services of independent consultants and Iowa Electric staff from the various departments. The QEP will identify any desirable changes in the QA Program, QA Manual, and implementing procedures. The review will utilize INPO Good Practices and other relevant industry experience, as well as applicable regulatory requirements. Procurement and design control are the first two aspects of QA to be reviewed.

Response to Item a of Violation No. 1

1. Corrective Action Taken and the Results Achieved

Nuclear Generation Division Procedure 104.1, Preparation, Review and Approval of Requisitions has been revised and reissued as Rev. 7, July 31, 1987. This procedure requires (section 6.1.1) that (1) for Quality Level I Items and Services, the method of acceptance shall be defined in the requisition; and (2) the acceptance criteria used to verify conformance to the procurement requirements shall be provided with or referenced on the requisition and sent to Quality Assurance.

Nuclear Generation Division Procedure 104.9, Acceptance of Items and Services, has been issued as Rev. 0, July 31, 1987. This new procedure establishes the specific process for developing acceptance criteria for items and services used at the Duane Arnold Energy Center. Section 6.1 states that acceptance criteria shall be developed by a responsible engineer.

Quality Assurance Procedure 1105.1, Receiving Inspection, has been revised and reissued as Rev. 3, June 26, 1987. Revised section 4.3 states that the Receiving Inspection Instructions are to be prepared by the Ouality Control Engineer (procurement) using technical and quality acceptance criteria that have been provided by the responsible engineering organization.

2. Corrective Actions to be Taken

No further corrective actions are necessary beyond those outlined above.

3. Date When Full Compliance will be Achieved

Full compliance has been achieved with the revision and implementation of NGD 104.1, Preparation, Review and Approval of Requisitions; issuance of NGD 104.9, Acceptance of Items and Services; and the revision and implementation of QAP 1105.1, Receiving Inspection, as indicated above.

Response to Item b of Violation No. 1

1. Corrective Action Taken and the Results Achieved

Quality Assurance Procedure 1104.6, Source Inspection, has been revised and reissued as Rev. 2, June 22, 1987. Revised Section 4.1 states that Design Engineering is responsible for delineating the specific attributes and characteristics to be inspected, and the acceptance criteria. The revised procedure, in Section 6.1, states that the documentation requirements and acceptance criteria shall be identified in the written request for a source inspection. The checklist information and requirements that are used by QA in the preparation of the source inspection checklist are required to be obtained from Design Engineering's source inspection request (section 6.3.2).

As discussed above, NGD 104.1 has been revised to make clear that the acceptance criteria shall be provided with or referenced on the requisition and sent to QA.

2. Corrective Actions to be Taken

No further corrective actions are necessary beyond those outlined above.

3. Date When Full Compliance will be Achieved

Full compliance has been achieved with the revision and implementation of Quality Assurance Procedure 1104.6, Source Inspection, and NGD 104.1, Preparation, Review and Approval of Requisitions.

Response to Item c of Violation No. 1

1. Corrective Action Taken and the Results Achieved

Quality Assurance Procedure 1104.6, Source Inspection, has been revised and reissued as Rev. 2, June 22, 1987. This revised procedure requires that acceptance criteria for source inspections be specified by Design Engineering (section 6.1). Also, a requirement has been added that the Responsible Design Engineer review the source inspection checklist (sections 5.1 and 6.3.4).

Quality Assurance Procedure 1105.1, Receiving Inspection, has been revised and reissued as Rev. 3, June 26, 1987. This revised procedure requires that the Receiving Inspection Instruction be prepared based on predetermined technical and quality acceptance criteria provided by the responsible engineering organization.

2. Corrective Actions to be Taken

No further corrective actions are necessary beyond those outlined above.

3. Date When Full Compliance will be Achieved

Full compliance has been achieved with the revision and implementation of Quality Assurance Procedures 1104.6 and 1105.1, Source Inspection and Receiving Inspection, respectively.

NRC Item of Violation No. 2 (Severity Level V)

2. "10 CFR 50, Appendix B, Criterion II, as implemented by Section 17.2.2 of the Duane Arnold Operational QA program, and by commitment in Duane Arnold Quality Assurance Manual, Chapter 2, to Regulatory Guide 1.88 (endorsing American National Standards Institute N45.2.9-1974) requires that consistent with applicable regulatory requirements, the licensee establish requirements, such as duration, concerning record retention.

Contrary to the above, the record retention duration for source inspections was incorrectly established as six years vice lifetime storage."

Response to Violation No. 2:

1. Corrective Action Taken and the Results Achieved

Quality Assurance Procedure 1104.6, Source Inspection was revised by Change Notice "A" on May 7, 1987. This Change Notice requires "lifetime" retention of Source Inspection Reports.

It should be noted that, in practice, all Source Inspection Reports have been retained and are available from the archive files.

All Quality Assurance Procedures in effect as of July 20, 1987, have been reviewed to assure that record retention times are in agreement with the Quality Assurance Manual, Appendix A, Records Retention Requirements. One inconsistency was discovered and corrected.

2. Corrective Actions to be Taken

No further corrective actions are necessary beyond those outlined above.

3. Date When Full Compliance will be Achieved

Full compliance has been achieved with the revision and implementation of Quality Assurance Procedure 1104.6, Source Inspection.

NRC Item of Violation No. 3 (Severity Level IV)

3. "10 CFR 50, Appendix B, Criterion VII requires that measures be established to assure that purchased materials, equipment, and services, whether purchased directly or through contractors and subcontractors, conform to the procurement documents and that measures include provisions, as appropriate, for source evaluation and selection, objective evidence of quality furnished by the contractor or subcontractor, inspection at the contractor or subcontractor source, and examination of products upon delivery.

Contrary to the above, source and receipt inspections conducted by Iowa Electric Light and Power Company in 1985 and 1986 failed to properly evaluate all of the inspected items critical quality characteristics. This resulted in the release for shipping and installation in the plant of the remote shutdown panel with welds of inadequate quality."

Response to Violation No. 3:

1. Corrective Action Taken and the Results Achieved

Quality Assurance Procedure 1104.6, Source Inspection, has been revised and reissued as Rev. 2, June 22, 1987. Revised Section 4.1 states that Design Engineering is responsible for delineating the specific attributes and characteristics to be inspected, and the acceptance criteria. The revised procedure states that the documentation requirements and acceptance criteria shall be identified in the written request for a source inspection. The checklist information and requirements that are used by QA in the preparation of the source inspection checklist are required to be obtained from Design Engineering's source inspection request. The revised procedure also requires that the completed Source Inspection Checklists/Reports be transmitted to Receiving Inspection.

Quality Assurance Procedure 1105.1, Receiving Inspection, has been revised and reissued as Rev. 3, June 26, 1987. This revision states that the requirements for receiving inspection shall be based upon the applicable procurement documents including the purchase specification, purchase order, procurement document changes, and source inspections, (as applicable). The revised procedure also states that the Receiving Inspection Instruction shall be prepared based on predetermined technical and quality acceptance criteria provided by the responsible engineering organization.

Nuclear Generation Division Procedure 104.7, Review of Vendor Procurement Documents, was revised by Change Notice 'B' on June 30, 1987, to clarify the requirements for review of vendor procurement documents. Revised section 6.1.6 states that the designated review organization shall provide a qualified reviewer(s) in the discipline(s) for the document review.

Quality Assurance Procedure 1116.3, Audits, has been revised and reissued as Rev. 3, June 22, 1987. The revised procedure requires that the checklists for vendor audits that are requested by engineering and conducted by QA should be reviewed and approved by the responsible engineer.

Additionally, as discussed in the response to violation No. 1, Iowa Electric has conducted a review of past source and receiving inspections to determine if problems of a similar nature existed in other procurements. Based on MIL-STD-105D, "Sampling Procedures and Tables for Inspection by Attributes", a sample of 80 receipt inspection reports was randomly selected from a total of 525 safety-related procurements made in 1985 and 1986. Quality Control and related inspection activities in these 80 procurements were found to be acceptable. Thirty-six procurements requiring source inspections were also reviewed. Only the two procurements from Frank Electric Co. (the remote shutdown panel and the degraded voltage panel) described in LER 87-008 (Attachment 2) had problems. The actions taken to correct the specific panel deficiencies are described in that LER.

2. Corrective Actions to be taken

No further corrective actions are necessary beyond those outlined above.

3. Date When Full Compliance will be Achieved.

Full compliance has been achieved with the implementation of the previously stated corrective actions.

NRC Item of Violation No. 4 (Severity Level IV)

4. "10 CFR 50, Appendix B, Criterion II, as implemented by Section 17.2.2 of the Duane Arnold Operational QA program, and by commitment in Duane Arnold Quality Assurance Manual, Chapter 2, to Regulatory Guide 1.123, Revision 1 (endorsing American National Standards Institute N45.2.13-1976) requires that personnel performing verification activities be qualified in accordance with ANSI N45.2.6 as applicable.

Contrary to the above, two out of eight source inspections performed during 1985 and 1986 were accomplished by personnel who were not qualified in accordance with ANSI N45.2.6."

Response to Violation No. 4:

1. Corrective Action Taken and the Results Achieved

The QA Engineers who performed the two source inspections met the requirements for education, training and professional experience of ANSI N45.2.6. However, these QA engineers were not certified in accordance with Iowa Electric's certification program.

Quality Assurance Procedure 1104.6, Source Inspection, has been revised and reissued as Rev. 2, June 22, 1987. The revised procedure (section 5.3) has been revised to make clear that in order to be qualified, personnel who perform source inspections must be certified in accordance with Quality Assurance Procedure 1111.2, Standard for Training and Certification of Quality Control Inspectors, which implements the requirements of ANSI N45.2.6. As a result, source inspections are now being conducted by qualified inspectors.

2. Corrective Actions to be Taken

No further corrective actions are necessary beyond those outlined above

3. Date When Full Compliance will be Achieved

Full compliance has been achieved with the revision and implementation of Quality Assurance Procedure 1104.6, Source Inspections.

NRC Item of Deviation

1. "Section 17.2.7.3 of the Duane Arnold Topical Report UFSAR/DAEC-1 states that a method will be established to provide information relative to the characteristics that have been inspected at the source and the characteristics that are to be inspected on receipt.

Contrary to the above, this commitment was not implemented by the Operational QA Program in that no method was established to provide information relative to the characteristics that had been inspected at the source and the characteristics that were to be inspected upon receipt."

Response to Deviation No. 1:

1. Corrective Action Taken and the Results Achieved

Quality Assurance Procedure 1104.6, Source Inspection, has been revised and reissued as Rev. 2, June 22, 1987. The revised procedure requires, in section 6.8, that completed Source Inspection Checklists/Reports be transmitted to Receiving Inspection.

Quality Assurance Procedure 1105.1, Receiving Inspection, has been revised and reissued as Rev. 3, June 26, 1987. This revision states that the requirements for receiving inspection shall be based upon the applicable procurement documents including the purchase specification, purchase order, procurement document changes, and source inspections, (as applicable). Also, revised Section 5.2 of QAP 1105.1, Rev 3, states that the Receiving Inspection Instruction shall be prepared based on predetermined technical and quality acceptance criteria provided by the responsible engineering organization.

Compliance with the revised source inspection procedure and Quality Assurance Procedure 1105.1, Receiving Inspection, implements Iowa Electric's commitment in section 17.2.7.3 of the Duane Arnold Topical Report UFSAR/DAEC-1.

2. Corrective Actions to be Taken

No further corrective actions are necessary beyond those outlined above

3. Date When Full Compliance will be Achieved

Full compliance has been achieved with the revision and implementation of Quality Assurance Procedures 1104.6, Source Inspection, and 1105.1, Receiving Inspection.

Iowa Electric Light and Power Company

June 22, 1987
DAEC-87-0749

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Subject: Duane Arnold Energy Center
Docket No. 50-331
Op. License DPR-49
Licensee Event Report No. ~~87-016~~ 87-008 Rev. 1

Gentlemen:

In accordance with 10 CFR 50.73 please find attached a copy of the subject revised Licensee Event Report.

Very truly yours,

Rick L. Hannen 6/22/87
Rick L. Hannen
Plant Superintendent - Nuclear

RLH/VJC/go

Attachment - LER 87-008 Rev 1

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

NRC Resident Inspector - DAEC

File A-118a

~~A-118a~~ 5a

NRC Form 366
(9 83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Duane Arnold Energy Center (DAEC)	0 5 0 0 0 3 3 1	1 OF 0 5

TITLE (4)

Inadequate Welding Qualification on the Remote Shutdown Panel due to Personnel Error

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
0 3	2 5	8 7	8 7	0 0 8	0 1	0 6	2 2	8 7	None	0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
	N	20.402(b)	20.405(c)	80.73(a)(2)(iv)	72.71(b)
POWER LEVEL (10)	0 0 0	20.405(a)(1)(i)	80.36(c)(1)	X 80.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	80.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	80.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	80.73(a)(2)(ii)	80.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	80.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
Valerie Crew, Technical Support Engineer	3 1 9 8 5 1 - 7 4 3 3

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	
A	J L	P L	F 2 0 1	NO							

SUPPLEMENTAL REPORT EXPECTED (14)

		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single-space typewritten lines) (16)

On March 12, 1987 it was determined that the remote shutdown panel installed in July 1985 contained welds which were not adequately qualified. On March 25, 1987 it was internally reported as a potential 10 CFR 21 issue. This was discovered as a result of a Quality Assurance vendor surveillance concerning a subsequent fuse panel purchase. Also, the procurement documents for the two degraded voltage relay panels installed in the plant in 1979 did not specify welding requirements.

Three errors contributed to the root cause of the 1985 event.

1. The Vendor failed to meet the contract requirements that the welding on the panel conform to American Welding Society (AWS) D1.1.
2. The responsible engineer mistakenly accepted documents that he believed were welding qualification documents.
3. During vendor audits, Quality Assurance accepted that proper welding procedures existed at the Vendor as a result of viewing vendor documents that were incorrect.

As immediate corrective actions the panels involved were modified or rewelded to ensure the seismic qualification was met. The contracted engineering firm involved implemented several corrective actions to preclude a recurrence of this event.

Iowa Electric has accomplished a thorough review of the procedures governing review of Vendor procurement documents, the design engineering and quality assurance procurement interface, and criteria provided for Vendor source inspection checklists. Additional procedures and revisions currently in process should prevent recurrence of this event.

This is being reported pursuant to 10 CFR 50.73(a)(2)(v), and as a noncompliance on the part of Frank Electric pursuant to 10 CFR 21.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Duane Arnold Energy Center (DAEC)	0 5 0 0 0 3 3 1	8 7	— 0 0 8	— 0 1	0 2 OF 0 5

TEXT (If more space is required, use additional NRC Form 366A's) (17)

On March 12, 1987 it was internally reported that the remote shutdown panel installed in July 1985 contained welds which were not adequately qualified. This was discovered as a result of a Quality Assurance Vendor surveillance concerning a subsequent fuse panel purchase. The surveillance also identified two panels (in the vendor's shop) in the subsequent purchase which were not adequately qualified.

Investigation of this condition, initiated on March 25, 1987, indicated that the seismic qualification was indeterminate. As a result this condition was determined to be reportable pursuant to 10 CFR 50.73a(2)(v) as 'Any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to shut down the reactor and maintain it in a safe shutdown condition.'

The design package which installed this panel required a welding procedure and welder qualification be received by the responsible engineer before the panel was manufactured. These qualification documents were required to be reviewed upon receipt for compliance with American Welding Society AWS D1.1-82. Welding in accordance with AWS D1.1-82, and receipt of the qualification documents showing AWS D1.1-82 compliance were contract stipulations with the vendor. If the practices were in compliance with the welding specification, then permission to proceed with manufacturing would be given to the vendor.

Correct documentation from the Vendor was never received and therefore not reviewed. The panel fabrication proceeded without the proper documentation stipulated in the contract with the vendor. The panel was then manufactured using a GMAW (Gas-Metal-Arc-Welding) procedure which was not qualified per AWS D1.1.

This panel was received and installed without the welding qualification documents. The panel was declared operable on July 15, 1985. This is being reported pursuant to 10 CFR 50.73a(2)(v) as 'Any event or condition that alone could have prevented the fulfillment of tne safety function of structures or systems that are needed to shut down the reactor and maintain it in a safe shutdown condition.'

Three errors contributed to be the root cause of this event.

1. The vendor, Frank Electric, failed to meet the contract stipulations that the welding on the panel had to conform to American Welding Society (AWS) D1.1. If using a GMAW welding process, AWS D1.1 requires a qualified procedure and a qualified welder trained on that procedure.

Weld coupons are tested to qualify a procedure and welder/operator per AWS D1.1. Testing to qualify a procedure involves tensile tests, bend tests and volumetric tests (per AWS D1.1). In 1978 the vendor sent welding coupons to an independent test lab in an effort to qualify their procedure and welder/operator. The lab performed the correct tests to qualify the welder and sent the vendor a report. The vendor then took this report supplied for welder/operator and used it to qualify the welding procedure per AWS D1.1. Since the testing requirements for certifying a welder/operator and a procedure are different, the procedure cannot be qualified using the same type of tests. Additional tests must be performed. Therefore the vendor welding procedure had not been qualified to the AWS D1.1.

The vendor welding procedures did not meet AWS D1.1 standards. The vendor Fabrication Inspection Checklist stated that procedures and welders were qualified per the standard. Also, vendor quality control personnel verified in writing, on a fabrication checklist, that welding was performed per AWS D1.1. Therefore, we have reason to suspect that other licensees could also potentially be affected by this defect.

2. The second contributing error was on the part of the responsible engineer in charge of the design change package. The proper welding qualification documents were not received for review prior to manufacturing the panel, which was a requirement of the contract. The only document that was sent by the vendor was the welding inspection procedure. The panel fabrication proceeded without the proper documentation stipulated in the contract with the vendor. After installation the engineer also signed that documents required for panel installation were received and attached to the package.

3. The third contributing factor was an inadequate source inspection conducted by Iowa Electric Quality Assurance in 1984. The inspectors accepted that proper welding procedures and qualified welders existed at the Vendor after viewing the Vendor Quality Control documents. The source inspection, primarily for the electrical terminations, verified from the vendor's fabrication inspection checklist that welding was qualified to AWS D1.1. Those documents later proved to be incorrect.

Actions taken to prevent recurrence are as follows:

Design Engineering and Quality Assurance administrative control procedures, implemented just prior to discovery of this problem, address the technical review of vendor documents and design interfaces. These procedures require a technical review and Quality Assurance review of safety related vendor packages prior to issuance.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Iowa Electric thoroughly reviewed these procedures and recommended the necessary revisions to preclude a similar occurrence. The quality assurance procedure governing source inspections has been revised to include acceptance criteria (including critical characteristics), as identified by Design Engineering, into the checklist. The procedures governing review of Vendor procurement documents will be strengthened in the area of multi-disciplinary technical review when required.

The checklists established by Quality Assurance for project specific audits will be reviewed with responsible engineers to insure that items of concern are being addressed in future vendor audits.

As the responsible design organization was a contracted engineering firm, Design Engineering reemphasized to the contracted engineering firm the importance of procedural adherence and participation in the Quality Assurance audit process. Further, Iowa Electric required the contracted engineering firm to review this incident and respond with appropriate corrective actions.

The contracted engineering firm responded to Iowa Electric's request for a review and appropriate changes to preclude such an event in the future. The firm will conduct training classes on "reviewing Vendor submittals" and "Supplier Document Processing". Additional emphasis will be added to the audit checklist to verify documentation received is correct and complete. Emphasis will also be placed on checklists for review of supplier's submittals against specific requirements. Additionally, 'special processes' (i.e., welding, soldering, painting, etc.) document submittals will be reviewed by specialists in these areas.

In response to this event, a thorough review was performed on all source inspections Quality Assurance has performed since 1975. During this review it was discovered that the package which installed the two degraded voltage relay panels in 1979, did not request or contain any weld specifications or qualification documents. Without the weld qualification documents, the validity of the seismic analysis was indeterminate.

The root cause of this event was personnel error on the part of the responsible design engineer. The utility employee did not specify welding requirements in the design package.

The degraded voltage relay panels were inspected by a welding engineer. The appropriate welding requirements were identified and the panels were rewelded with Shielded-Metal-Arc-Welding (SMAW) per AWS D.1.3. The seismic qualification requirements were then valid. A review of previous purchase orders with Frank Electric was performed. It was determined that all safety related panels purchased from Frank Electric had been identified and reworked prior to the review (namely the remote shutdown panel and the two degraded voltage relay panels).

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Duane Arnold Energy Center (DAEC)	0 5 0 0 0 3 3 1	8 7	— 0 0 8	— 0 1	0 5 OF 0 5

TEXT (If more space is required, use additional NRC Form 366A's) (17)

The degraded bus voltage relays sense essential bus voltage and prevent damage to safety related equipment due to a degraded voltage condition. Actuation of these relays cause the Emergency Diesel Generators (EIIS EK) to start and the supply breakers to the busses to open, causing total decay of the bus voltage. Engineering judgement indicates that the degraded voltage relays would have performed their safety function during a seismic event.

The remote shutdown panels provide the capability for plant shutdown from outside the main control room in the event that the control room becomes uninhabitable. Updated Final Safety Analysis Report Chapter 7.4.2.2.1 states "The central remote shutdown panel, including all safety-related instrumentation mounted on it, is designed to withstand the safe shutdown earthquake with no loss of safety functions."

With the original welding documents and the inspections performed on the original welds it is indeterminate whether the remote shutdown panel would have withstood the safe shutdown earthquake with no loss of safety functions.

Currently, the plant is in a refuel outage, and the remote shutdown panel is not required. The panel was inspected by a welding engineer. The appropriate welding requirements were identified and the panels were reinforced with support brackets. This action exceeded the seismic requirements for the panel. Therefore, the seismic integrity of the remote shutdown panel is no longer in question.

This is being reported pursuant to 10 CFR 50.73a(2)(v) as 'Any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to shut down the reactor and maintain it in a safe shutdown condition.' On April 11, 1987 an evaluation concluded that this condition is reportable as a noncompliance on the part of Frank Electric Corporation, PO Box 69, York, Pennsylvania 17405, pursuant to 10 CFR 21. Verbal notification to the Region III Administrator was made on April 13, 1987.