

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8704240225 DOC. DATE: 87/04/15 NOTARIZED: NO DOCKET #  
 FACIL: 50-331 Duane Arnold Energy Center, Iowa Electric Light & Pow 05000331  
 AUTH. NAME AUTHOR AFFILIATION  
 CREW, V. Iowa Electric Light & Power Co.  
 ROTHERT, W. C. Iowa Electric Light & Power Co.  
 MINECK, D. L. Iowa Electric Light & Power Co.  
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 87-008-00: on 870312, remote shutdown panel, installed in Jul 1985, found w/welds not adequately qualified. Caused by vendor error. Corporate QA checklist reviewed. Part 21 related. W/870415 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 7  
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

| RECIPIENT ID CODE/NAME   | COPIES LTTR ENCL | RECIPIENT ID CODE/NAME | COPIES LTTR ENCL |
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| <u>REG FILE</u> 02       | 1 1              | RES SPEIS, T           | 1 1              |
| RGN3 FILE 01             | 1 1              |                        |                  |

EXTERNAL: EG&G GROH, M 5 5 H ST LOBBY WARD 1 1  
 LPDR 1 1 NRC PDR 1 1  
 NSIC HARRIS, J 1 1 NSIC MAYS, G 1 1

TOTAL NUMBER OF COPIES REQUIRED: LTTR 42 ENCL 40

**LICENSEE EVENT REPORT (LER)**

|   |  |                            |
|---|--|----------------------------|
| FACILITY NAME (1)<br><b>Duane Arnold Energy Center (DAEC)</b> | DOCKET NUMBER (2)<br><b>0500031311</b> | PAGE (3)<br><b>1 OF 04</b> |
|---|--|----------------------------|

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                |  |  |
| 03             | 25  | 87   | 87             | 008               | 00              | 04              | 15  | 87   | None                          |  |  |
|                |     |      |                |                   |                 |                 |     |      | DOCKET NUMBER(S)<br>050000    |  |  |

|                                |  |                  |                     |  |  |  |  |  |  |  |
|--------------------------------|--|------------------|---------------------|--|--|--|--|--|--|--|
| OPERATING MODE (9)<br><b>N</b> | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11) |                  |                     |  |  |  |  |  |  |  |
| POWER LEVEL (10)<br><b>000</b> | 20.402(b)  | 20.408(e)        | 50.73(a)(2)(iv)     | 73.71(b)   |  |  |  |  |  |  |
|                                | 20.408(a)(1)(i)  | 50.38(a)(1)      | 50.73(a)(2)(v)      | 73.71(e)   |  |  |  |  |  |  |
|                                | 20.408(a)(1)(ii)   | 50.38(a)(2)      | 50.73(a)(2)(vi)     | OTHER (Specify in Abstract below and in Text, NRC Form 355A)<br><b>10 CFR 21</b> |  |  |  |  |  |  |
|                                | 20.408(a)(1)(iii)  | 50.73(a)(2)(i)   | 50.73(a)(2)(vii)(A) |  |  |  |  |  |  |  |
|                                | 20.408(a)(1)(iv)   | 50.73(a)(2)(ii)  | 50.73(a)(2)(vii)(B) |  |  |  |  |  |  |  |
|                                | 20.408(a)(1)(v)  | 50.73(a)(2)(iii) | 50.73(a)(2)(ix)     |  |  |  |  |  |  |  |

LICENSEE CONTACT FOR THIS LER (12)

|   |  |
|---|--|
| NAME<br><b>Valerie Crew, Technical Support Engineer</b> | TELEPHONE NUMBER<br><b>3119 8511-1741313</b> |
| AREA CODE   |  |

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

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPROS | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPROS |
|-------|--------|-----------|--------------|---------------------|-------|--------|-----------|--------------|---------------------|
| A     | JIL    | PILI      | F121011      | NO                  |       |        |           |              |                     |

SUPPLEMENTAL REPORT EXPECTED (14)

|   |    |                               |       |     |      |
|---|----|-------------------------------|-------|-----|------|
| <input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) | NO | EXPECTED SUBMISSION DATE (15) | MONTH | DAY | YEAR |
|   |    |                               | 017   | 311 | 817  |

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. The surveillance also identified two panels (in the vendor's shop) in the subsequent purchase which were not adequately qualified.

Three errors contributed to the root cause of this 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 initial corrective actions, the Corporate Quality Assurance checklists established for project specific Vendor audits will be reviewed with the responsible engineer to insure items are addressed. Design Engineering will reemphasize to the contracted engineering firm involved the importance of procedural adherence. The incident is still under investigation, and details of any further corrective actions will be provided in the follow-up report. The remote shutdown panels provide the capability for plant shutdown from outside the main control room in the event the control room becomes uninhabitable. 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.

JE22  
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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

|   |  |                |                   |                 |          |       |
|---|--|----------------|-------------------|-----------------|----------|-------|
| FACILITY NAME (1)<br><br>Duane Arnold Energy Center | DOCKET NUMBER (2)<br><br>0 5   0   0   0   3   3   1 | LER NUMBER (6) |                   |                 | PAGE (3) |       |
|   |  | YEAR           | SEQUENTIAL NUMBER | REVISION NUMBER |          |       |
|   |  | 87             | 008               | 00              | 02       | OF 04 |

TEXT (7) more space is required, use additional NRC Form 308A'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 the 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.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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|---|--|----------------|-------------------|-----------------|----------|--------|
| FACILITY NAME (1)<br><br>Duane Arnold Energy Center | DOCKET NUMBER (2)<br><br>0 5   0   0   0   3   3   1 | LER NUMBER (6) |                   |                 | PAGE (3) |        |
|   |  | YEAR           | SEQUENTIAL NUMBER | REVISION NUMBER |          |        |
|   |  | 8 7            | - 0 0 8           | - 0 0           | 0 3      | OF 0 4 |

TEXT (If more space is required, use additional NRC Form 388A's) (17)

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 involved a vendor audit and source inspection conducted by Iowa Electric Quality Assurance in 1984. The auditors 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 reoccurrence 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 enhance the technical review and Quality Assurance review prior to issuance of design packages.

Design Engineering and Quality Assurance will thoroughly review these procedures and accomplish revisions needed to preclude a repeat occurrence.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

|   |  |                |                            |                        |          |        |
|---|--|----------------|----------------------------|------------------------|----------|--------|
| FACILITY NAME (1)<br><br>Duane Arnold Energy Center | DOCKET NUMBER (2)<br><br>0 5 0 0 0 3 3 1 | LER NUMBER (6) |                            |                        | PAGE (3) |        |
|   |  | YEAR<br>8 7    | SEQUENTIAL NUMBER<br>0 0 8 | REVISION NUMBER<br>0 0 | 0 4      | OF 0 4 |

TEXT (If more space is required, use additional NRC Form 388A's) (17)

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

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.

The corrective actions listed above will be in place July 31, 1987.

The incident is still under investigation, and details of any further corrective actions will be provided in the follow-up report.

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."

Currently, the plant is in a refuel outage, and the remote shutdown panel is not required. Investigations are proceeding into the seismic implications and qualification of the panel welding. These investigations and any other necessary corrective actions will be completed before startup from the current refuel outage. Prior to startup the remote shutdown panel will be properly qualified. Further information will be provided in a later report before July 31, 1987.

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 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.

Iowa Electric Light and Power Company

April 15, 1987  
DAEC-87-


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. 87-008

Gentlemen:

In accordance with 10 CFR 50.73 and 10 CFR 21 please find attached a copy of the subject Licensee Event Report.

Very truly yours,

  
William C. Rothert  
Manager, Nuclear Projects

  
Daniel L. Mineck  
Plant Superintendent - Nuclear

DLM/VJC/go

Attachment - LER 87-008

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

Director, Office of Inspection and Enforcement (3 copies)  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

NRC Resident Inspector - DAEC

File A-118a

*IF 22/11*

April 15, 1987

TO: L. Liu  
L. Root  
R. McGaughy  
W. Rothert (Safety Committee)  
E. Matthews  
H. Rehrauer  
D. Wilson  
R. Hannen  
R. Salmon  
K. Young  
G. Van Middlesworth

K. Howard  
Operations Shift Supervisors  
DAEC Supervision - Routing Slip  
STA Coordinator  
INPO  
S. Swails  
R. Lessly  
P. Seckman  
W. Miller  
DAEC Commitment Control

FROM: D. Mineck   
Plant Superintendent - Nuclear

FILE: A-118a

Please find attached one copy of a Licensee Event Report  
that has been transmitted to the NRC.

Reportable Occurrence Report No. 87-008

Notification Letter No. DAEC-87-

DR Number

go\*

April 15, 1987

To: Routing  
From: J. Thorsteinson  
Subject: Concurrence with Outgoing Correspondence  
Reference: LER 87-008

Concurrence with and release of the referenced document is requested.

Originator Valerie Crew  
Technical Support Supervisor Jeffrey C. Spitzer 4/15/87  
Department Supervisor \_\_\_\_\_  
Department Supervisor \_\_\_\_\_  
Technical Services - Superintendent \_\_\_\_\_  
A.P.S.-Operations Rick Hammer 4/15/87  
Operations Committee Chairman Rick Hammer 4/15/87

VJC/go