

ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8807060569 DOC.DATE: 88/07/01 NOTARIZED: NO DOCKET #
 FACIL:50-261 H.B. Robinson Plant; Unit 2, Carolina Power & Light C 05000261
 AUTH.NAME AUTHOR AFFILIATION
 SAYRE,D. Carolina Power & Light Co.
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 RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 88-012-00:on 880603,potential for post-accident neutron
 flux signal interference due to mfg defect.

W/8 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 5
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

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| INTERNAL: ACRS MICHELSON | 1 1 | ACRS MOELLER | 2 2 |
| AEOD/DOA | 1 1 | AEOD/DSP/NAS | 1 1 |
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| ARM/DCTS/DAB | 1 1 | DEDRO | 1 1 |
| NRR/DEST/ADS 7E | 1 0 | NRR/DEST/CEB 8H | 1 1 |
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| NRR/DREP/RAB 10 | 1 1 | NRR/DREP/RPB 10 | 2 2 |
| NRR/DRIS/SIB 9A | 1 1 | NUDOCS-ABSTRACT | 1 1 |
| REG FILE 02 | 1 1 | RES TELFORD,J | 1 1 |
| RES/DE/EIB | 1 1 | RES/DRPS DEPY | 1 1 |
| RGN2 FILE 01 | 1 1 | | |
| EXTERNAL: EG&G WILLIAMS,S | 4 4 | FORD BLDG HOY,A | 1 1 |
| H ST LOBBY WARD | 1 1 | LPDR | 1 1 |
| NRC PDR | 1 1 | NSIC HARRIS,J | 1 1 |
| NSIC MAYS,G | 1 1 | | |

LICENSEE EVENT REPORT (LER)

| | | | | | | | | | | | | | | | | |
|---|--------|--|----------------|-------------------|-----------------|------------------|-----------------|-----------|----------------|--|--|-------|------------------|--|--|--|
| FACILITY NAME (1) H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2 | | | | | | | | | | DOCKET NUMBER (2) 0 5 0 0 0 2 6 1 | | | | PAGE (3) 1 OF 0 4 | | |
| TITLE (4) POTENTIAL FOR POST-ACCIDENT NEUTRON FLUX SIGNAL INTERFERENCE DUE TO MANUFACTURING DEFECT | | | | | | | | | | | | | | | | |
| 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 6 | 0 3 | 8 8 | 8 8 | 0 1 2 | 0 0 | 0 7 | 0 1 | 8 8 | | | | | 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) | | | | 50.73(a)(2)(iv) | | | | 73.71(b) | | |
| POWER LEVEL (10) | | 20.405(a)(1)(i) | | | | 50.36(c)(1) | | | | 50.73(a)(2)(v) | | | | 73.71(c) | | |
| 0 6 1 0 | | 20.405(a)(1)(ii) | | | | 50.36(c)(2) | | | | 50.73(a)(2)(vii) | | | | OTHER (Specify in Abstract below and in Text, NRC Form 366A) | | |
| | | 20.405(a)(1)(iii) | | | | 50.73(a)(2)(i) | | | | 50.73(a)(2)(viii)(A) | | | | | | |
| | | 20.405(a)(1)(iv) | | | | 50.73(a)(2)(ii) | | | | 50.73(a)(2)(viii)(B) | | | | | | |
| | | 20.405(a)(1)(v) | | | | 50.73(a)(2)(iii) | | | | 50.73(a)(2)(x) | | | | | | |
| LICENSEE CONTACT FOR THIS LER (12) | | | | | | | | | | | | | | | | |
| NAME Don Sayre, Senior Specialist - Regulatory Compliance | | | | | | | | | | TELEPHONE NUMBER AREA CODE 8 0 3 3 8 3 - 1 2 4 2 | | | | | | |
| COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13) | | | | | | | | | | | | | | | | |
| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPD | | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPD | | | | | | |
| B | I G | M O N | | Y | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| 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 June 3, 1988, with the reactor at 60 percent power, the licensee determined a 10CFR21 reported condition existed. The post-accident neutron flux monitor manufacturer had notified the licensee of the potential for defective solder connections which could allow moisture intrusion and subsequent signal interference. The licensee justified continued operation based on the inoperability of the monitors following a Design Basis Accident (DBA). The detectors were installed to satisfy NRC Regulatory Guide 1.97 and their function is solely to assist Plant operators in determining whether a reactor restart is developing. In lieu of the monitors being operable following a DBA, Plant operators would initiate emergency boration as a conservative control if required since the primary Nuclear Instrumentation System is not qualified to operate following an accident. The monitor manufacturer has notified the NRC pursuant to 10CFR21. The cause of the solder defects has been attributed to the manufacturing process utilized between October 1983 and May 1987. Repair kits and installation instructions are currently projected to be available in August 1988 to correct the condition. The licensee will develop a plan for the repair. This LER is submitted under 10CFR50.73(a)(2)(v).

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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| H. B. ROBINSON S. E. PLANT, UNIT 2 | 0 5 0 0 0 2 6 1 | 8 8 | — 0 1 2 | — 0 0 | 0 2 | OF | 0 4 |

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

I. DESCRIPTION OF EVENT

On Friday, June 3, 1988, with the Unit at 60 percent reactor power, the licensee determined that a 10 CFR 21 reported condition existed.¹ The manufacturer of the two neutron flux monitors installed at Unit No. 2 for post-accident monitoring had notified the licensee of the possibility that the detector cable assemblies may experience moisture intrusion during post-accident conditions.^{2,3,4} According to the manufacturer, a deficiency in the manufacturing process between October 1983 and May 1987 resulted in certain defects in soldering which could allow moisture from outside the assemblies to intrude the cables at specific connections.⁵ The potential for moisture intrusion during post-accident conditions could result in interference with the signals provided by the neutron flux monitors.

The licensee engineering group evaluated the condition to document justification for continued operation. The evaluation provided assurance that failure of the assemblies under post-accident conditions would have no affect on mitigating the consequences of an accident since the system is designed only to assist Plant Operations personnel in the event the primary Nuclear Instrumentation System (NIS) should fail. The primary NIS is not qualified to operate in the harsh environment that may follow a Design Basis Accident (DBA). Under post-accident conditions, the neutron flux monitors would be expected to provide information of value in determining whether a reactor restart was developing. With these monitors inoperable, Operations personnel would initiate emergency boration as a conservative control if required.

The condition was reviewed by the licensee Plant Nuclear Safety Committee and the justification for continued operation was concurred with. Pending repair of the two monitors installed and the one spare monitor in Plant stock, Plant Operations personnel have been instructed to consider the neutron flux monitors inoperable during post accident conditions.

¹/H. B. Robinson Steam Electric Plant, Unit No. 2 is a 700 megawatt Westinghouse Pressurized Water Reactor power plant, in commercial operation since March 1971.

²/Manufacturer: Gamma-Metrics, 5550 Oberline Drive, San Diego, California 92121.

³/Notification by letter from C. L. Lingren, Gamma-Metrics, to E. E. Utley, CP&L, dated May 10, 1988.

⁴/ Neutron flux monitor EIIS Codes: System - IG; Component - MON; Manufacturer - Not available.

⁵/Cause Code: B.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

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

II. CAUSE OF EVENT

The manufacturer of the post-accident neutron flux monitors submitted a letter to the NRC on May 10, 1988, to provide information pursuant to 10 CFR 21.21(3).⁶ The submittal referenced a February 19, 1988 letter notifying the NRC of a possible problem with solder connections on certain cable assemblies installed as part of neutron flux monitoring systems for satisfying NRC Regulatory Guide 1.97. A similar notification had been made to the licensee by letter from the manufacturer on February 22, 1988. Since these first submittals, the manufacturer had identified the nature of the problem through the testing of various cable assemblies and then analyzing the cause of the leaks which were discovered. The leaks in the cable assemblies could cause degraded performance of the neutron flux monitoring channel or could cause the channel to fail during a Design Basis Accident. The leaks were found at certain solder joints in the cable assemblies.

III. ANALYSIS OF EVENT

A leak in the solder joints could allow moisture to come in contact with three cable connectors which could result in signal interference if the moisture entered three certain connectors: 1) the type HN coaxial connectors inside the detector assembly, 2) the type N coaxial connectors inside of the junction box, and 3) the Amphenol style triaxial connectors at the electrical penetration. If moisture entered the connectors, it could interfere with the monitor signal by causing voltage breakdown.

The neutron flux monitors are utilized to monitor the post-accident status of the reactor core and as a channel for the Dedicated Shutdown System. The defective solder condition affects only the use of the monitors during and following a DBA, and so, are of no impact to their use as a Dedicated Shutdown channel. During a DBA, the monitors have no protection or control function involved in mitigating the consequences of the accident. The monitors are only to assist Operations personnel should the primary NIS become inoperable. The primary NIS is not qualified to operate in the harsh environment that may follow a DBA. Under these circumstances, information provided by the post-accident neutron flux monitors would be utilized for determining whether a reactor restart was developing. With the neutron flux monitors inoperable, Operations personnel would initiate emergency boration as a conservative control if required.

The post-accident neutron flux monitors are components in a monitoring system that is outside of the scope of the Plant Technical Specifications. Failure of the system would neither increase the probability or consequences of a DBA nor affect the operability of equipment important to safety as analyzed in the Plant Updated Final Safety Report, Chapter 15.

⁶/Letter from C. L. Lingren, Gamma-Metrics, to the Director, Office of Inspection and Enforcement, NRC, dated May 10, 1988.

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

V. CORRECTIVE ACTION

The post-accident neutron flux monitor manufacturer has projected that repair kits and installation instructions should be available by August 1988. The licensee will develop a plan for the repair work pending availability of materials and instructions. Two of the monitors are installed inside the Containment Vessel, a third monitor maintained in Plant stock as a spare. The necessary repair work will be considered for inclusion in the 1988 Refueling Outage.

Plant Operations personnel have been instructed to consider the post-accident neutron flux monitors inoperable following a DBA. A caution tag to this effect was hung June 3, 1988, on the Inadequate Core Cooling Monitors A and B on the post-accident monitoring panel in the Unit No. 2 Control Room.

VI. ADDITIONAL INFORMATION

A. Failed Component Identification

The GAMMA-METRICS neutron flux monitor consists of:

1. A detector assembly
2. An incontainment cable assembly
3. An amplifier cable assembly (from penetratio to amplifier)
4. An amplifier assembly
5. A signal processor
6. An isolator expansion module

The detector assembly, cable assemblies, and amplifier are interconnected via the electrical penetration by coaxial connectors, triaxial connectors, and hose fittings. The cables and connectors are inside a stainless steel flexible metal hose. The cable is safety-grade Class 1E manufactured to the exact length for installation, with both ends terminated with connectors or connector pins. ⁷

B. Previous Similar Events

None.

1/U. S. Patent Nos. 4495144 and 4568514.



Carolina Power & Light Company

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HARTSVILLE, SOUTH CAROLINA 29550

JUL 01 1988

Robinson File No: 13510C

Serial: RNP/88-3009
(10 CFR 50.73)

United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261
LICENSE NO. DPR-23
LICENSEE EVENT REPORT 88-012-00

Gentlemen:

The enclosed Licensee Event Report (LER) is submitted in accordance with
10 CFR 50.73 and NUREG-1022 including Supplements No. 1 and 2.

Very truly yours,

R. E. Morgan
General Manager
H. B. Robinson S. E. Plant

DAS:lko

Enclosure

cc: Dr. J. N. Grace
Mr. L. W. Garner
INPO

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