CATEGORY 1

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AUTH.NAME AUTHOR AFFILIATION
SCHOEPF,P. American Electric Power Co., Inc.
BLIND,A.A. American Electric Power Co., Inc.
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 96-006-00:on 960223,Train B PORV declared inoperable. Caused by result of water related degradation of "Kapton" insulation on conductors.Feedthrough 2 in penetration 2-CEP-4CI replaced.W/960617 ltr.

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TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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CATEGORY 1 DOCUMENT

American Electric Power
Cook Nuclear Plant
One Cook Place
Bridgman, MI 49106
616 465 5901

AEP
AMERICAN ELECTRIC POWER

June 17, 1996

United States Nuclear Regulatory Commission
Document Control Desk
Rockville, Maryland 20852

Operating Licenses DPR-74
Docket No. 50-316

Document Control Manager:

In accordance with the criteria established by 10 CFR 50.73 entitled Licensee Event Report System, the following report is being submitted:

96-006-00

Sincerely,

A. A. Blind
Site Vice President

/clc

Attachment

c: H. J. Miller, Region III
E. E. Fitzpatrick
P. A. Barrett
R. F. Kroeger
S. J. Brewer
M. R. Padgett
G. Charnoff, Esq.
D. Hahn
Records Center, INPO
NRC Resident Inspector

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NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	Page 1 of 4
Donald C. Cook Nuclear Plant - Unit 2	05000 316	

TITLE (4)
Power Operated Relief Valve Inoperable In Excess of the Time Allowed by the Technical Specification Action Statement, Due to Ground Resulting from Water in Penetration Flood-up Tube

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 NAME	DOCKET NUMBER
02	23	96	96	-- 006 --	00	06	17	96	None	
									FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	1
POWER LEVEL (10)	100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.2201(b)		20.2203(a)(3)(i)		50.73(a)(2)(iii)		73.71(b)
	20.2203(a)(1)		20.2203(a)(3)(ii)	X	50.73(a)(2)(iv)		73.71
	20.2203(a)(2)(i)		20.2203(a)(4)		50.73(a)(2)(v)		OTHER
	20.2203(a)(2)(ii)		50.36(c)(1)		50.73(a)(2)(vii)		(Specify in Abstract below and in Text, NRC Form 366A)
	20.2203(a)(2)(iii)		50.36(c)(2)		50.73(a)(2)(viii)(A)		
	20.2203(a)(2)(iv)		50.73(a)(2)(i)		50.73(a)(2)(viii)(B)		
	20.2203(a)(2)(v)		50.73(a)(2)(ii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Paul Schoepf, Plant Engineering Superintendent	616/465-5901, x2408

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

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES	X	NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

Technical Specifications 3.4.11.b for the Pressurizer Power Operated Relief Valves (PORV) requires that with one PORV inoperable, within 1 hour either restore to operable status or close the associated block valve and remove power from the block valve.

Contrary to this requirement, it was determined valve 2-NRV-151, Pressurizer Train B PORV, was inoperable in excess of the 1 hour allowed by the Action Statement prior to its being declared inoperable on February 23, 1996. This conclusion was reached after the it was discovered during the recent refueling outage that the conductors for 2-NRV-151 had shorted to the conductors of another valve due to water related degradation of the conductor insulation. In accordance with 10CFR50.73(a)(2)(i)(B), this event is being reported as operation prohibited by Technical Specifications.

The feedthrough containing the conductors for the 2-NRV-151 was replaced. All other feedthroughs in penetration 2-CEP-4C1 were disassembled and inspected for moisture intrusion. Two additional feedthroughs were cleaned, dried and the tubing either reassembled or replaced.

Technical Specifications allow operation in Modes 1, 2 and 3 with one PORV inoperable. Between January 30, 1996 and the start of the refueling outage, the two other unit PORVs were operable. For post-accident primary pressure control only two valves are assumed to be available, and analysis shows only one PORV to be necessary for pressure control. Based on the analysis, it has been determined that at no time was the health or safety of the public in jeopardy, and that this event had no safety impact.

Conditions Prior to Event

Unit 2 was in Mode 1, Power Operation, at 100 percent Rated Thermal Power

Description of Event

On January 30, 1996, during routine review of the control panels, an operator noted that valve 2-IRV-140, the Number 4 Accumulator Drain (EIIS/BP) to the Reactor Coolant Drain Tank (RCDT) (EIIS/CA), showed intermediate indication. This intermediate indication appeared to be the result of a limit switch problem with the valve, as neither the accumulator or the RCDT showed any sign of a level change, and no other activities were in progress at the time to which the change in indication could be attributed. An Action Request was then written to check the limit switches for the 2-IRV-140.

On February 20, 1996, the Job Order for the limit switch activity on the 2-IRV-140 was worked and the "open" limit switch replaced. The replacement of the limit switch, however, did not resolve the problem of the intermediate indication. On February 23, 1996, during subsequent troubleshooting, it was discovered that the conductors for 2-NRV-151, Pressurizer Train B Power Operated Relief Valve (PORV) (EIIS/AB), which runs through the same feedthrough in penetration 2-CEP-4C1, had shorted to the conductors for the 2-IRV-140, and was providing power to the valve position indication.

Valve 2-NRV-151 was immediately declared inoperable, its companion block valve closed and power removed. The Job Order was returned to Planning for inclusion in the then upcoming Unit 2 refueling outage, as it was determined that the corrective maintenance needed to return 2-NRV-151 to operable status would have to be performed during an outage.

In April, 1996, when the penetration feedthrough was disassembled during the outage, it was discovered that the feedthrough flood-up tube contained enough water to immerse the conductors running through the tubing. Several conductors in the feedthrough, including the conductors for both the 2-NRV-151 position indication and solenoid control, were degraded.

Cause of Event

The shorted conductors for the 2-NRV-151 valve were determined to be the result of water related degradation of the "Kapton" insulation on the conductors.

"Kapton" is the DuPont trade name for aromatic polyamide, a tough, flame- and high temperature-resistant material with good insulating properties. One characteristic of Kapton insulating material is its inability to withstand moisture for prolonged periods of time.

Cause of Event (cont'd)

In the case of penetration 2-CEP-4C1, feedthrough 2, approximately 24 inches of length of the conductors was found to be submerged in water. The Kapton insulation on the submerged portion of the conductors had begun to unravel, creating a ground circuit between the copper conductor and the metal tubing. This internal ground caused the problems identified with valves 2-NRV-151 and 2-IRV-140.

No firm evidence could be found as to how the moisture entered the tubing, or how long the water had been present. No defects in the tubing were identified by inspection, and the entrance to the flood-up tube from inside the flood-up box had been previously sealed.

Analysis of Event

This event is being reported in accordance with 10CFR50.73(a)(2)(i)(B), as a condition prohibited by Technical Specifications.

Valve 2-NRV-151 was declared inoperable on February 23, 1996, after it was discovered that its conductors were grounded and affecting the indication of 2-IRV-140. Normally, under the guidance of NUREG-1022, "Event Reporting Guidelines, 10CFR50.72 and 10CFR50.73", a component would be considered inoperable at the time of discovery. However, in accordance with the guidance of the same NUREG, there was "firm evidence", based upon the condition of the conductors powering the valve's solenoid found during the refueling outage, that 2-NRV-151 had been inoperable since January 30, 1996.

On May 17, 1996, after review of all available information pertaining to the event, it was determined that the 2-NRV-151 had been inoperable since January 30, 1996. Since the valve was not declared inoperable until February 23, 1996, this constitutes a failure to comply with the requirement for 1 hour action contained in The Action Statement for Technical Specification 3.4.11, which constitutes a condition prohibited by the Technical Specifications.

The event was evaluated and determined to have no safety significance. Valve 2-NRV-151 had previously been stroked satisfactorily in October 1994, during the previous refueling outage after cable replacement, and there was no indication that a grounding problem existed prior to January 1996.

During the operating cycle prior to the refueling outage, the two other PORVs, 2-NRV-152 and -153 were operable. The Technical Specification allows operation in Modes 1, 2 and 3 with one PORV inoperable, so that operation between January 20 and February 23, 1996, was within the allowances of the safety analyses. For post-accident primary pressure control only two valves are assumed to be available, however analysis further deems only one PORV to be necessary for pressure control. Based on these analyses, it had been determined that at no time was the health or safety of the public in jeopardy, and that this event had no safety impact.

Corrective Action

Feedthrough 2 in penetration 2-CEP-4C1 was replaced, as well as a previously planned evolution to replace feedthrough 11.

All other feedthroughs in penetration 2-CEP-4C1 were disassembled and inspections performed for moisture intrusion. Of these, only feedthroughs 8 and 9 showed signs of moisture, while all others were in excellent condition. Feedthrough 8 was satisfactorily meggered, cleaned, dried and the tubing reassembled. In addition to meggering, cleaning and drying, feedthrough 9 had a section of the flood-up tubing replaced due to the presence of 2 pinholes. The conductors in both feedthroughs were in excellent condition.

During the next refueling outages for both units, the flood-up tubes will be inspected for moisture intrusion by breaking the conduit union at the splice tube. Approximately one third of the flood-up tubes will be inspected each outage until all have been inspected.

Additionally, during the next refueling outage on both units, all flood-up tube entrances to flood-up boxes will be inspected and subsequently sealed, if sealant is not already present.

Failed Component Identification

N/A

Previous Similar Events

None