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ACCESSION NBR: 8707080589 DOC. DATE: 87/06/29 NOTARIZED: NO DOCKET #
FACIL: 50-316 Donald C. Cook Nuclear Power Plant, Unit 2, Indiana & 05000316
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SMITH, W. G. Indiana & Michigan Electric Co.
RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 87-004-00: on 870601, turbine trip/reactor trip occurred due to loss of main condenser vacuum. Caused by failure of manual isolation valve. Procedures implemented to verify proper response of automatic protection sys. W/870629 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 5
TITLE: Environmental Event Report (per Tech Specs)

NOTES:

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EXTERNAL:	EG&G GROH, M	5	5	H ST LOBBY WARD	1	1
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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)
D. C. Cook Nuclear Plant, Unit 2	0 5 0 0 0 3 1 6	1 OF 0 4

TITLE (4): ESF Actuation (Turbine Trip/Reactor Trip) Due to Loss of Condenser Vacuum Resulting from Failed Isolation Valve

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 1	8 7	8 7	0 0 4	0 0	0 6	2 9	8 7	D.C. Cook, Unit 1	0 5 0 0 0 3 1 5
										0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)								
POWER LEVEL (10)	0 9 0		20.402(b)		20.405(c)	X	50.73(a)(2)(iv)		73.71(b)	
			20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)	
			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	TELEPHONE NUMBER
	AREA CODE
A. A. Blind - Assistant Plant Manager	6 1 6 4 6 5 - 5 9 0 1

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	
X	S G	I S V	C 1 8 2	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 1, 1987, at 2340 hours, a turbine trip/reactor trip occurred due to a loss of main condenser vacuum. The loss of vacuum was the result of a degraded isolation valve (LPD-169) utilized while removing a blank flange installed at LPD-170 (miscellaneous drain tank header isolation to Unit 1 and the turbine room sump).

The cause of this event has been determined to be the failure of a manual isolation valve. Following the trip, inspection of LPD-169 (a soft seat butterfly valve) revealed that severe degradation of the valve seat had occurred. This degradation allowed excessive air in-leakage to occur from the open drain tank discharge header. This air in-leakage in turn resulted in the reduction of condenser vacuum and the subsequent turbine trip/reactor trip.

Immediate corrective actions involved Operations personnel implementing plant procedures to verify proper response of the automatic protection system and to assess plant conditions for initiating appropriate recovery actions. The subject valve was replaced - [no additional preventive action has been deemed necessary].

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

Conditions Prior to Occurrence

Unit 2 in Mode 1 (power operation) at 90 percent Reactor Thermal Power.

Description of Event

On June 1, 1987, at 2340 hours, a turbine trip/reactor trip occurred due to a loss of main condenser (EIIS/SG-COND) vacuum. The loss of vacuum was the result of a degraded seat within an isolation valve (LPD-169) (EIIS/ISV) utilized while removing a blank flange (EIIS/BLK) installed at LPD-170 (miscellaneous drain tank (EIIS/TK) header isolation to Unit 1 and the turbine room sump).

In preparation for the removal of the blank flange, several valves, including LPD-169 (a manual isolation valve-miscellaneous drain tank to condenser) were closed and the applicable portion of the header drained. Approximately 15 minutes after the header was isolated, the Assistant Shift Supervisor at the job site (Licensed Reactor Operator) was informed that condenser vacuum was beginning to drop rapidly. Before the Assistant Shift Supervisor could locate an additional isolation valve, vacuum had dropped enough to actuate the turbine trip/reactor trip sequence [opening of the reactor trip breakers (EIIS/BKR), insertion of reactor control rods (EIIS/ROD), feedwater isolation, automatic starting of the motor driven and turbine driven auxiliary feedpumps (EIIS/P)]. There was no automatic or manual actuation of the intermediate head safety injection system (EIIS/BQ).

Operations personnel immediately implemented special emergency operating procedure 2-OHP-4023.E-0 to verify proper response of the automatic protection system (EIIS/JC) and to assess plant conditions for initiating appropriate recovery action.

The Unit was stablized in Mode 3 (Hot Standby) at 0003 hours, June 2, 1987. The NRC was notified of the event via ENS at 0005 hours, June 2, 1987.

With the exception of the excessive leakage of the manual isolation valve there were no inoperative structures, components, or systems that contributed to this event.

Cause of Event

The cause of this event has been determined to be the failure of the manual isolation valve. Following the trip, inspection of LPD-169 (a soft seat butterfly valve) revealed that severe degradation of the valve seat had occurred. This degradation allowed excessive air in-leakage to occur from the open drain tank discharge header. This air in-leakage in turn resulted in the reduction of condenser vacuum and the subsequent turbine trip/reactor trip.

Analysis of Event

This engineered safety features actuation, which resulted in a reactor trip, is reportable persuant to 10 CFR 50.73(a)(2)(iv).

The automatic protection system responses; reactor trip/turbine trip, and resultant actuations, were all verified to have functioned properly as a result of the Engineered Safety Features Actuation. Based on the above, it is concluded that the health and safety of the public were not affected.

It should be noted however, that several minor secondary system failures occurred, none of which jeopardized equipment or plant safety (e.g. steam supply shut-off valve to feedwater heater 5A failed to close). In addition, the Operation Sequence Monitor (OSM) failed to print the correct or accurate equipment actuation times, consequently a complete time study was not possible. Through secondary means, it was determined that the reactor trip breakers actuated in less than 100 ms which is consistent with previous data. All other applicable equipment actuations were also verified. The OSM was repaired, verified operable, and returned to service on June 3, 1987.

Corrective Actions

Immediate corrective action involved Operations personnel implementing plant procedures to verify proper response of the automatic protection system and to assess plant conditions for initiating appropriate recovery actions. The subject valve was replaced - [no additional preventive action has been deemed necessary].

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
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TEXT *(If more space is required, use additional NRC Form 366A's)* (17)

Failed Component Identification

Butterfly Isolation Valve
Plant Designation - 2-LPD-169
Manufacturer - Centerline, Inc.
Model - Number N/A, 6 inch 150 lb.
EIIS Code - ISV

Previous Similar Events

None.

American Electric Power System
INDIANA & MICHIGAN ELECTRIC COMPANY
DONALD C. COOK NUCLEAR PLANT
P.O. Box 458, Bridgeman, MI 49106
Telephone (616) 465-5901

June 29, 1987

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

Operating License DPR-74
Docket No. 50-316

Document Control Manager:

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

87-004

Sincerely,

A. Alan Blind for

W. G. Smith, Jr.
Plant Manager

Attachment

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