

CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9809180258 DOC. DATE: 98/09/14 NOTARIZED: NO DOCKET #
 FACIL: 50-315 Donald C. Cook Nuclear Power Plant, Unit 1, Indiana M 05000315
 AUTH. NAME AUTHOR AFFILIATION
 WEBER, L. Indiana Michigan Power Co. (formerly Indiana & Michigan Ele
 SAMPSON, J. R. Indiana Michigan Power Co. (formerly Indiana & Michigan Ele
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 98-038-00: on 980814, potential for single failure to isolate ECCS suction paths were noted. Caused by lack of written communication. Revised EOP to correct condition. With 980914 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 5
 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL
PD3-3 PD	1 1	STANG, J	1 1
INTERNAL: AEOD/SPD/RAB	2 2	AEOD/SPD/RRAB	1 1
<u>FILE CENTER</u>	1 1	NRR/DE/ECGB	1 1
NRR/DE/EELB	1 1	NRR/DE/EMEB	1 1
NRR/DRCH/HICB	1 1	NRR/DRCH/HOHB	1 1
NRR/DRCH/HQMB	1 1	NRR/DRPM/PECB	1 1
NRR/DSSA/SPLB	1 1	RES/DET/EIB	1 1
RGN3 FILE 01	1 1		
EXTERNAL: L ST LOBBY WARD	1 1	LITCO BRYCE, J H	1 1
NOAC POORE, W.	1 1	NOAC QUEENER, DS	1 1
NRC PDR	1 1	NUDOCS FULL TXT	1 1

NOTE TO ALL "RIDS" RECIPIENTS:

PLEASE HELP US TO REDUCE WASTE. TO HAVE YOUR NAME OR ORGANIZATION REMOVED FROM DISTRIBUTION LISTS OR REDUCE THE NUMBER OF COPIES RECEIVED BY YOU OR YOUR ORGANIZATION, CONTACT THE DOCUMENT CONTROL DESK (DCD) ON EXTENSION 415-2083

FULL TEXT CONVERSION REQUIRED

TOTAL NUMBER OF COPIES REQUIRED: LTTR 22 ENCL 22

C
A
T
E
G
O
R
Y

1

D
O
C
U
M
E
N
T

Indiana Michigan
Power Company
Cook Nuclear Plant
One Cook Plant
Bridgman, MI 49106
616 465 5901



September 14, 1998

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Operating License DPR-58
Docket No. 50-315

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:

98-038-00

Sincerely,

A handwritten signature in cursive script, appearing to read 'John R. Sampson'.

J. R. Sampson
Site Vice President

/mbd

Attachment

c: J. L. Caldwell (Acting), Region III
R. P. Powers
P. A. Barrett
J. B. Kingseed
R. Whale
D. Hahn
Records Center, INPO
NRC Resident Inspector

9809180258 980914
PDR ADDCK 05000315
S PDR

100046

LICENSEE EVENT REPORT (LER)(See reverse for required number of
digits/characters for each block)ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY
INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED
ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO
INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE
INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), 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

FACILITY NAME (1) Cook Nuclear Plant Unit 1	DOCKET NUMBER (2) 50-315	PAGE (3) 1 of 4
--	---------------------------------	------------------------

TITLE (4) Potential for Single Failure to Isolate Emergency Core Cooling System Suction Paths
--

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	
08	14	98	98	-- 038	-- 00	09	14	98	Cook Unit 2	50-316	
OPERATING MODE (9)			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)								
5			20.2201 (b)				20.2203(a)(2)(v)		50.73(a)(2)(i)		
POWER LEVEL (10)			20.2203(a)(1)				20.2203(a)(3)(i)		50.73(a)(2)(ii)		
00			20.2203(a)(2)(i)				20.2203(a)(3)(ii)		50.73(a)(2)(iii)		
			20.2203(a)(2)(ii)				20.2203(a)(4)		50.73(a)(2)(iv)		
			20.2203(a)(2)(iii)				50.36(c)(1)		X 50.73(a)(2)(v)		
			20.2203(a)(2)(iv)				50.36(c)(2)		50.73(a)(2)(vii)		
									OTHER		
									Specify in Abstract below or in NRC Form 366A		

LICENSEE CONTACT FOR THIS LER (12)									
NAME Mr. Larry Weber, Operations Manager								TELEPHONE NUMBER (Include Area Code) 616/465-5901, x2443	

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 (If Yes, complete EXPECTED SUBMISSION DATE).						X NO				

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

On August 14, 1998, with Units 1 and 2 in Mode 5, during review of the Emergency Operating Procedures (EOP), it was discovered that an EOP revision established conditions such that a single failure, such as an electrical short circuit ("hot smart short") or an operator error, could have resulted in the isolation of the Emergency Core Cooling System (ECCS) suction flow path following entry into the EOPs. This condition was determined to be reportable under 10CFR50.72(b)(2)(iii)(D) to have the potential to alone prevent fulfillment of the safety function of structures or systems needed to mitigate the consequences of an accident. An ENS notification was made on August 14, 1998 at 1407 hours the same day. This report is submitted in accordance with 10CFR50.73(a)(2)(v)(D).

The primary cause of this event report was lack of written communication. Written controls for revision of emergency operating procedures and the application of the single failure criterion did not contain basic information important for complete evaluation of proposed changes for single failure problems.

The EOP will be revised to correct the condition. As an interim preventive action, pending the review and completion of the necessary revisions to the appropriate procedures and the EOP Verification and Validation Guidelines, familiarization will be provided to EOP writers and reviewers to ensure that they address the "hot smart short" and "operator error" considerations relative to the single failure criterion.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER(2)	LER NUMBER (6)				PAGE (3)
		YEAR	SEQUENTIAL NUMBER		REVISION NUMBER	
		98	--	038	--	00

Cook Nuclear Plant Unit 1

50-315

2 of 4

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

Conditions Prior to Event

Unit 1 was in Mode 5, Cold Shutdown

Unit 2 was in Mode 5, Cold Shutdown

Description of Event

On August 14, 1998, as part of a continuing review of the Emergency Operating Procedures, it was discovered that a previous revision (Revision 3) of Emergency Operating Procedure OHP 4023.ES-1.3, "Transfer To Cold Leg Recirculation," modified the time in the transfer sequence when control power is restored to various vital Emergency Core Cooling System (ECCS) valves. Power restoration, previously performed immediately before valve repositioning, had been moved forward to step 3 in the procedure. This opened up a period of time after power was restored and before valve repositioning was required when an operator error or electrical short circuit ("hot smart short") could cause inappropriate valve closure. Closure of Refueling Water Storage Tank (RWST) suction isolation valves to ECCS pumps or closure of the Safety Injection (SI) pump leakoff valve at the wrong time could defeat portions of both ECCS trains.

A historical review of the revisions to OHP 4023. ES-1.3 was conducted to determine the sequence of events that occurred that led to the revision of OHP 4023. ES-1.3 and whether consideration was made of the potential adverse effect of the procedure change which introduced the possibility of operator errors and electrical short circuits that could defeat safety system functions.

Procedures OHP 4023.ES-1.3 for Units 1 and 2 were revised in December 1996 to enhance the procedures. One of the changes that was made was to move the restoration of power for the following valves to the front of the procedure to accommodate human factors enhancements:

ICM-305	Recirculation Sump To East RHR/CTS Pumps
ICM-306	Recirculation Sump To West RHR/CTS Pumps
IMO-390	Residual Heat Removal Pumps Suction From RWST
IMO-261	Safety Injection Pump Suction From RWST
IMO-262	Safety Injection Pump to RWST
IMO-263	Safety Injection Pump to RWST

This change was initiated by the EOP Coordinator and reviewed by the EOP Oversight Committee. The safety screening and the committee review did not recognize that moving all of the valve control power restoration to the front of the procedure would present a single failure criteria concern.

On January 6, 1997, the procedure was changed back to restoring valve control power just prior to operating the valves for switchover to the recirculation mode of ECCS operation. This change was made when it was discovered that restoring control power at the front of the procedure extended the time required to switch to cold leg recirculation. The change was not made based on single failure concerns.

In January of 1998, the steps to restore control power were again moved to the front of the procedure. The change was based on human factors considerations. It was considered to be easier for the Reactor Operator and to present less chance of error if the valve control power restoration for all of the valves was to be performed at one time. This change, previously reversed due to time constraints, was made possible when the criterion for entry into OHP 4023. ES-1.3 was set at a higher RWST level, providing extra time to complete the switchover. The January 1998 revision to OHP 4023.ES-1.3 was formally reviewed to ensure all single failure events were addressed.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER(2)	LER NUMBER (6)				PAGE (3)
		YEAR	SEQUENTIAL NUMBER		REVISION NUMBER	
		98	--	038	-- 00	

Cook Nuclear Plant Unit 1

50-315

3 of 4

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

Description of Event (cont'd)

It was identified in April of 1998 that the January 1998 revision (Revision 5) might be contrary to the single failure criteria. A Condition Report was written at that time, however it was determined not to be reportable to the NRC since both units were in Mode 5 and OHP 4023. ES-1.3 was not applicable in Mode 5. An investigation then continued to determine if the condition had existed previously in earlier OHP 4023. ES-1.3 revisions during periods in which the plant was operating.

Cause of Event

The primary cause of this event report was lack of written communication. Written controls for revision of emergency operating procedures and the application of the single failure criterion did not contain basic information important for complete evaluation of proposed changes for single failure problems. The applicability of electrical short circuits and operator error considerations had not been adequately clear during the procedural review process.

The documents that had been provided for use as guidance for EOP revisions had not provided the necessary information to ensure that the author and reviewers of the OHP 4023.ES-1.3 revision would consider the necessary aspects of single failure requirements.

Contributing to this event was a narrowly focused response to a similar condition reported to the NRC in LER 315/97-021-01, dated November 14, 1997. The LER documented that the sequence for switchover from injection to recirculation mode of ECCS operation specified in procedure OHP 4023. ES-1.3 was found to create the potential for a single active failure to disable both ECCS trains. The sequence of pump starts and suction valve isolations could cause loss of both trains if the West RHR pump failed while it was the sole source of suction to the SI and charging pumps.

The root cause of this condition was determined to be the failure to identify and incorporate into appropriate documents and controls a change in interpretation of the meaning of the term "single active failure" from the time the term was utilized in the original FSAR. A lack of specific information, which could have been extracted and captured during the plant's licensing history, regarding the definition and application of the term "single active failure" is an element shared with the event being reported in this LER.

Preventive action documented in LER 315/97-021-01 cited the development of a document, AEPNGG Directive 800000-DIR-2300-04, "Definition and Use of Design Bases and Single Failure Criteria." Attachment 3 to this document provides direction on the definition and use of the "single failure criteria". Added to Attachment 3 as an example of an "active failure" was "the failure to continue to run." Based on the apparent "isolated" nature of the event reported in LER 315/97-021-01 and recent improvements in the EOP review process, no preventive actions were considered necessary, beyond training and the development of the AEPNGG directive.

Analysis of Event

This event was reported via the ENS on August 14, 1998 at 1407 hours EDT under 10CFR50.72(b)(2)(iii)(D), as a condition that potentially could have prevented the fulfillment of the safety function of a structure or system. This LER is submitted in accordance with 10CFR50.73(a)(2)(v)(D), which is also a condition that potentially could have prevented the fulfillment of the safety function of a structure or system.

One suction isolation valve from the RWST supplies both trains of the Residual Heat Removal (RHR) System, and another single isolation valve from the RWST supplies both SI Pumps. To ensure that the valves remain open to supply RWST water to the ECCS pumps, control power is removed from the isolation valves. The suction supplies are transferred to the recirculation mode of operation when RWST level drops to a preset level, at which time control power is restored to the RWST isolation valves, and the valves are then closed.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER(2)	LER NUMBER (6)				PAGE (3)
		YEAR	SEQUENTIAL NUMBER		REVISION NUMBER	
		98	--	038	--	00

Cook Nuclear Plant Unit 1

50-315

4 of 4

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

Analysis of Event (cont'd)

The EOP revision restored control power to the RWST suction isolation valves earlier than when necessary to close the valves. This restoration of control power established a condition that would allow a single failure in the circuit to close the RWST suction isolation valves. Inadvertent closure of the RWST suction valves would cause the ECCS pumps to run with no suction supply, damaging the pumps and preventing injection to the reactor coolant system.

During December 31, 1996 to January 6, 1997, during which both units were in Mode 1 power operation, the revision to OHP 4023. ES-1.3 could have been invoked in the event of an accident, potentially resulting in loss of both trains of ECCS if an operator error was made in manipulation of certain of the ECCS valves or if an electrical short circuit occurred. Because the control power would have been restored to the ECCS valves for the brief time period of 10 to 30 minutes prior to switchover, the chance of a "hot smart short" would have been minimal. The chance of operator error would have been small because proper performance of these procedure steps is recognized as the highest priority evolution in progress in the control room. One person reading the step sequence to another person, whose undivided attention is on the control manipulations for switchover, performs the procedure. Thorough simulator training was provided on the ECCS switchover evolution. Therefore, the safety significance of this event is considered low and the health and safety of the public were not endangered.

Corrective Actions

Procedures 1/2 OHP 4023.ES-1.3 will be revised to return the valve control power restoration evolution to its previous location immediately preceding valve operation. This will be completed before the associated unit enters Mode 4.

As an interim preventive action, pending the review and completion of the necessary revisions to the appropriate procedures and the EOP Verification and Validation Guidelines, familiarization will be provided by October 16, 1998, to EOP writers and reviewers to ensure that they address the "hot smart short" and "operator error" considerations relative to the single failure criterion.

Failed Component Identification

Not applicable

Previous Similar Events

LER 315/97-021-01