

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9410110049 DOC.DATE: 94/10/03 NOTARIZED: NO DOCKET #
 FACIL:50-316 Donald C. Cook Nuclear Power Plant, Unit 2, Indiana M 05000316
 AUTH.NAME AUTHOR AFFILIATION
 WEBER,G.A. Indiana Michigan Power Co. (formerly Indiana & Michigan Ele
 BLIND,A.A. Indiana Michigan Power Co. (formerly Indiana & Michigan Ele
 RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 94-006-00:on 940906,six MSSVs failed to meet TS lift
 setpoint requirements.Caused by galling between valve disk &
 nozzle.NRR issued TS Amend 167 to Unit 2 TS,increasing MSSV
 tolerance on 940909.W/941003 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED:LTTR 1 ENCL 1 SIZE: 6
 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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Indiana Michigan
Power Company
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One Cook Place
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616 465 5901



October 3, 1994

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:

94-006-00

Sincerely,

A handwritten signature in cursive script that reads 'A. A. Blind'.

A. A. Blind
Plant Manager

/sb
Attachment

c: J. B. Martin, Region III
E. E. Fitzpatrick
P. A. Barrett
R. F. Kroeger
M. A. Bailey - Ft. Wayne
NRC Resident Inspector
J. B. Hickman - NRC
J. R. Padgett
G. Charnoff, Esq.
D. Hahn
INPO
S. J. Brewer

110055

9410110049 941003
PDR ADOCK 05000316
S PDR

Handwritten initials, possibly 'IFR' or 'JFR', with a vertical line drawn through them.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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.

FACILITY NAME (1)

D. C. COOK NUCLEAR PLANT - UNIT 2

DOCKET NUMBER (2)

05000 316

PAGE (3)

1 OF 4

TITLE (4) FAILURE OF THE UNIT TWO MAIN STEAM SAFETY VALVES TO MEET TECHNICAL SPECIFICATION
LIFT SETPOINT REQUIREMENTS

EVENT DATE (5)			LER NUMBER (6)			REPORT NUMBER (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
09	06	94	94	006	00	10	03	94	FACILITY NAME	DOCKET NUMBER
										05000
										05000

OPERATING MODE (9)	3	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)						
POWER LEVEL (10)	00	20.402(b)		20.405(c)		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
		20.405(a)(1)(iii)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)
		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: G. A. WEBER - PLANT ENGINEERING SUPERINTENDENT
TELEPHONE NUMBER (Include Area Code): 616-465-5901

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	SB	RV	D243	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X					

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

On September 6, 1994, with the Unit 2 Reactor in Mode 3 (hot standby), routine surveillance testing found the initial lift pressures for six of twenty Main Steam Safety Valves (MSSVs) outside the +/- one percent setpoint tolerance established by Plant Technical Specifications. Five of the valves lifted above the allowable setpoint range; one lifted below the allowable range. However, all six initial lifts were within +/- three percent of their nominal lift setpoint. Three of the MSSVs had acceptable subsequent lifts and did not require adjustment. Based on previous events, the high initial lift is believed to be caused by mild galling between the valve disk and nozzle, along with mechanical "keying" and/or chemical bonding of the mixed oxides on the disk with the chromium oxide on the nozzle. The other three valves did require adjustment to restore them to within tolerances. These were partially attributed to setpoint drift.

On September 9, 1994, D. C. Cook was granted a Technical Specification amendment which increased the MSSV setpoint tolerances to +/- three percent. The as-found condition reported here under the more stringent Technical Specifications in effect previously, has already been analyzed as part of the licensing submittal and determined not to have an adverse impact on the health and safety of the public.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (8)			PAGE (3)	
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D. C. COOK NUCLEAR PLANT - UNIT 2	0 5 0 0 0 3 1 6	9 4	- 0 0 6	- 0 0	0 2 OF 0 4	

TEXT (If more space is required, use additional NRC Form 368A's) (17)

Conditions Prior to Occurrence:

Unit Two - Mode 3 (hot standby)

Description of Event:

On September 6, 1994, six of the twenty Main Steam Safety Valves (MSSVs) (EIIIS/SB-RV) lift setpoints were found outside of the +/- one percent tolerance limits established in Unit 2 Technical Specification 3.7.1.1. Five of the six out-of-tolerance MSSVs had a lift setpoint between one and three percent high. One MSSV had a lift setpoint that was 1.5 percent low.

The MSSVs at Cook are Dresser Model 3707RA Safety Valves. Based on operating experience and vendor input, the valve lift setpoints cannot be consistently maintained within +/- one percent tolerance limits.

The required relief pressure setpoint ranges and the as-found setpoints for the MSSVs found out of specification are listed below:

Date	Valve I.D. No.	Stm. Gen.	T/S Setpoint	Allowable Range (PSIG)	As Found (PSIG)	Percent Deviation
09-06-94	2-SV-1B-1	1	1065	1054-1075	1094	2.7
09-06-94	2-SV-2B-1	1	1075	1064-1086	1107	3.0
09-06-94	2-SV-2A-2	2	1075	1064-1086	1059	1.5
09-06-94	2-SV-1A-3	3	1065	1054-1076	1086	2.0
09-06-94	2-SV-1A-4	4	1065	1054-1076	1084	1.8
09-06-94	2-SV-1B-4	4	1065	1054-1075	1087	2.1

Retests were performed on the MSSVs to make necessary setpoint adjustments and ensure as-left lift setpoints were acceptable. The subsequent MSSV tests revealed that some sticking was experienced on the initial lifts and was not indicative of the actual setpoint values. Three of the MSSVs with high initial lifts required no adjustment as subsequent lifts were acceptable.

MSSV 2-SV-1A-2 (Steam Generator No. 2) had an acceptable as-found lift setpoint, but subsequent retests revealed that the lift setpoint was erratic and this valve was not returned to service. The Action Statement of Technical Specification 3.7.1.1 was met as the Power Range Neutron Flux High Trip Setpoint was reduced prior to testing of the MSSVs.

Cause of Event:

Three of the five valves that lifted high were retested and found to lift within the allowable range without adjustment. Based on the investigation of similar previous events, the tendency of the valves to initially lift high is believed to be caused by mild galling between the valve disk and nozzle, along with mechanical "keying" and/or chemical bonding of the mixed oxides on the disk with the chromium oxide on the nozzle. It is believed these combined effects over time caused the elevated lift setpoint on the MSSV's initial lifts. The other three valves did require adjustment to restore them to within tolerances. These deficiencies were partially attributed to setpoint drift.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 368A's) (17)

Cause of Event continued:

As the result of previous events, several MSSV discs were sent to an independent laboratory for analysis. Results of the analysis indicated that the contact surfaces of the discs were found to have been covered with mixed iron-chromium oxides over most of their surfaces except for islands of nozzle material. The nozzle material transfer most likely occurred by a galling or adhesive wear mechanism rather than a diffusion bonding process. The mixed oxides on most of the sealing surface are postulated to have developed from normal oxidation of the disk alloy along with possible deposition of iron-oxide particulates from the steam. (This cause was previously identified in LER 315/94-01, Revision 1.)

Previous testing data has indicated that there is a correlation between the number of MSSV failures and the main steam pressure transients/unit trips. With fewer transients occurring during an operating cycle, more MSSV failures would occur. The Unit 2 MSSVs were last tested in February, 1994, and a unit trip occurred on August 15, 1994.

Analysis of Event:

This event is reportable via the provisions of 10CFR50.73(a)(2)(i)(B) as an operation prohibited by Plant Technical Specification 3.7.1.1. The Technical Specification 3.7.1.1 requires that the Main Steam Safety Valves be operable in Modes 1 through 3. Operability requires that all twenty Main Steam Safety Valves lift within +/- 1 percent of the Technical Specification Setpoints.

The Safety Evaluation revealed that the MSSV as-found lift setpoints would not have resulted in exceeding the design rating of the steam generators. This event would not be reportable in the future as the out-of-specification MSSVs had lift setpoints within three percent of the Technical Specification value. On September 9, 1994, the NRR issued Amendment No. 167 to the Unit 2 Technical Specifications, increasing the MSSV tolerance to \pm three percent.

Corrective Action:

Three of the six MSSVs with the initial lift setpoints outside the acceptable setpoint ranges retested satisfactorily and did not require any adjustment. Three of the out-of-tolerance MSSVs required adjustment to return the setpoint to acceptable values.

MSSV 2-SV-1A-2 had erratic lift setpoints and was declared inoperable. This valve will be repaired during the current Refueling Outage. One additional MSSV (2-SV-2B-2) required adjustment. The initial lift was acceptable, but retests indicated a slightly low lift setpoint.

Failed Component Identification:

Main Steam Safety Valve
Manufacturer: Dresser Consolidated Valves
Model: 3707RA-RT22
EIIS Code: SB-RV

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 368A's) (17)

Previous Similar Events:

50-315/94-01	50-316/92-03
50-315/92-06	50-316/90-06
50-315/90-13	50-316/88-04
50-315/89-02	
50-315/87-11	
50-315/86-20	