

# CATEGORY 1

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9605210368      DOC. DATE: 96/05/15      NOTARIZED: NO  
 FACIL: 50-270 Oconee Nuclear Station, Unit 2, Duke Power Co.  
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 RECIP. NAME                      RECIPIENT AFFILIATION

DOCKET #  
05000270

SUBJECT: LER 96-001-00: on 960416, determined post-LOCA boron dilution design basis not being met. Caused by inadequate work practices. Procedures revised & personnel trained on procedure changes. W/960515 ltr.

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

NOTES:

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**DUKE POWER**

May 15, 1996

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555

Subject: Oconee Nuclear Station  
Docket Nos. 50-269, -270, -287  
Licensee Event Report 270/96-01

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a) (1) and (d), attached is Licensee Event Report, 270/96-01, concerning the post LOCA boron dilution design basis not being met.

This report is being submitted in accordance with 10 CFR 50.73 (a) (2) (ii). This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

J. W. Hampton, Vice President  
Oconee Nuclear Site

/fts

Attachment

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Document Control Desk  
May 15, 1996

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**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)

DOCKET NUMBER (2)

PAGE (3)

Oconee Nuclear Station, Unit Two

05000 270

1 OF 4

TITLE (4)

POST LOCA BORON DILUTION DESIGN BASIS NOT MET DUE TO INADEQUATE WORK PRACTICES

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
04	16	96	96	01	00	05	15	96		05000
										05000

  

OPERATING MODE (9)	POWER LEVEL (10)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)								
N	0	20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)		
		20.2203(a)(1)		20.2203(a)(3)(ii)	X	50.73(a)(2)(ii) (B)		50.73(a)(2)(x)		
		20.2203(a)(2)(i)		20.2203(a)(3)(iii)		50.73(a)(2)(iii)		73.71		
		20.2203(a)(2)(iii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER		
		20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A		
		20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)				

LICENSEE CONTACT FOR THIS LER (12)

NAME

TELEPHONE NUMBER (Include Area Code)

L. V. Wilkie, Safety Review Manager

(864) 885-3518

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

MONTH DAY YEAR

YES

(If yes, complete EXPECTED SUBMISSION DATE).

NO

X

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

On March 28, 1996, Unit 2 was shutdown for a refueling outage. Operations personnel were reviewing the Emergency Operations Procedure (EOP) and noted that the post Loss Of Coolant Accident (LOCA) boron dilution valve lineup was different from that described in the Low Pressure Injection (LPI) System procedure. The Engineered Safeguards valve checklist requires the LPI return line manual block valve (2LP-4) to be closed and the EOP requires the valve to be open. The valve cannot be opened following a LOCA due to high dose rates. There are three potential boron dilution flow paths. The Final Safety Analysis Report requires two of the three boron dilution flow paths to be available. One of the paths was technically inoperable, due to Generic Letter 95-07, from the last satisfactory valve stroke testing on May 5, 1995. Since 2LP-4 was closed in November 1994, there was technically only one flow path available from May 5, 1995 to March 28, 1996. The root cause is Work Practices; Error Detection Practices; System alignment not verified. Corrective actions include revising the LPI procedure, reviewing portions of the procedure change for other errors, and training operations procedure preparers on this event.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Oconee Nuclear Station, Unit Two	05000				2 OF 4
	270	96	01	00	

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

BACKGROUND

One of the design functions of the Low Pressure Injection (LPI) [EIIS:BP] System is to limit the concentration of boric acid in the reactor vessel following a Loss Of Coolant Accident (LOCA). There are three redundant boron dilution flow paths provided in the design of the LPI System. Two of these flow paths are available by positioning LPI System valves to establish the flow (active flow paths). One path is available via reactor vessel internal flow (passive flow path).

The Oconee Final Safety Analysis Report requires at least two of these three boron dilution flow paths to be available following a LOCA.

The boron dilution flow path ensures that unacceptable boron concentrations do not develop in the core, resulting in boron precipitation and loss of heat transfer capability following a LOCA.

EVENT DESCRIPTION

On March 28, 1996, Unit 2 was at hot shutdown and in the process of continuing to cold shutdown conditions in preparation for a refueling outage. Operations personnel reviewing the Emergency Operations Procedure (EOP) discovered a discrepancy between the EOP and the Low Pressure Injection (LPI) System operating procedure. The LPI System operating procedure Engineered Safeguards [EIIS:JE] valve checklist indicated that manual block valve (2LP-4) should be closed. The EOP indicates that the valve is to be open.

The design basis function of valve 2LP-4 is to be open. This allows Reactor Coolant [EIIS:AB] System recirculation through the secondary dilution flow path and avoids boron precipitation during a large break Loss Of Coolant Accident (LOCA). This manual valve is located in an area where dose rates would be high following a LOCA thus prohibiting its operation. Since the valve was closed, the secondary flow path was not available.

Subsequent investigation revealed that a procedure change was approved October 5, 1994 and implemented when Unit 2 was preparing for start-up from a refueling outage in November 1994. This change incorporated four changes into a retype that included changes required due to the installation of a modification. The modification allowed for the LPI System to accommodate a "high pressure" mode decay heat removal alignment. The change made to

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Oconee Nuclear Station, Unit Two	05000				3 OF 4
	270	96	01	00	

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

the Unit 2 LPI procedure was similar to a previous change made to the Unit 1 LPI procedure which required valve 1LP-4 to be closed. The Operations investigation into the discrepancy for Unit 2 revealed that the Unit 2 procedure change was initiated with the previous change on Unit 1 in mind. Due to differences in system piping configuration, closing 1LP-4 was correct on Unit 1. The procedure change documentation, including the 10CFR50.59 evaluation, addressed the overall change, but did not specifically address the change in position of 2LP-4.

The primary boron dilution flow path (2LP-103 and 104) had been declared technically inoperable as of the last satisfactory stroke testing of the valves on May 5, 1995, due to Generic Letter 95-07 (pressure locking/thermal binding). Since the primary boron dilution path was technically inoperable and the secondary flow path was not operable, the boron dilution system did not meet the Final Safety Analysis Report design basis from May 5, 1995, until discovery on March 28, 1996. This conclusion was reached when Engineering completed an evaluation on the incorrect positioning of valve 2LP-4 on April 16, 1996.

CONCLUSIONS

The root cause of this event is Work Practices; Error Detection Practices; System alignment not verified. A procedure change was not correctly implemented. Operations personnel had incorrectly revised the Unit 2 procedure based on the Unit 1 valve alignment.

A historical search of events and problem reports over the last two years indicates that there have been procedure discrepancies. However, the search did not indicate that the error made in this event is a recurring problem.

There were no equipment failures associated with this event.

No personnel injuries, radiation exposures, or releases of radioactive materials occurred with this event.

CORRECTIVE ACTIONS

Immediate

1. Valve 2LP-4 was positioned to the open position.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Oconee Nuclear Station, Unit Two	05000				4 OF 4
	270	96	01	00	

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Subsequent

1. The Unit 2 Low Pressure Injection (LPI) System operations procedure was revised to show valve 2LP-4 in the open position.
2. The Unit 2 LPI System operations procedure change involving the 2LP-4 error was reviewed to ensure no other discrepancies existed.

Planned

1. Operations procedure preparers will be trained on the error made in this event and the importance of documenting any changes to procedures in the 10CFR50.59.
2. Counsel the personnel involved.

SAFETY ANALYSIS

The Final Safety Analysis Report Section 6.3 requires at least two of the three boron dilution flow paths to be available.

One of the two active boron dilution flow paths had been unavailable since the previous Unit 2 refueling outage in November 1994. The primary active flow path was available, but was technically inoperable since May 5, 1995, due to postulated pressure locking/thermal binding per Generic Letter 95-07.

A passive flow path through the Reactor vessel internals was available. Since it is passive, it is not susceptible to single failure. Therefore, system function was never lost, core cooling should not be affected, and no core damage would be expected.

The health and safety of the public was not affected by this event.