

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8704130222 DOC. DATE: 87/03/30 NOTARIZED: NO
 FACIL: 50-269 Oconee Nuclear Station, Unit 1, Duke Power Co.
 AUTH. NAME NORTH, P. J. AUTHOR AFFILIATION Duke Power Co.
 TUCKER, H. B. Duke Power Co.
 RECIP. NAME RECIPIENT AFFILIATION

DOCKET #
05000269

SUBJECT: LER 87-003-00: on 870227, discovered potential for overpressurization exists in event control valves MS-126 & MS-129 given erroneous signal to open fully. Caused by failure to determine safety valve capacity. W/B70330 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 5
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES: AEDD/Ornstein: 1cy.

05000269

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INTERNAL:	ACRS MICHELSON		1	1	ACRS MOELLER		1	1	
	ACRS WYLIE		1	1	AEDD/DOA		1	1	
	AEDD/DSP/ROAB		2	2	AEDD/DSP/TAPB		1	1	
	NRR/ADT		1	1	NRR/DEST/ADE		1	0	
	NRR/DEST/ADS		1	0	NRR/DEST/CEB		1	1	
	NRR/DEST/ELB		1	1	NRR/DEST/ICSB		1	1	
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	NRR/DEST/SGB		1	1	NRR/DLPQ/HFB		1	1	
	NRR/DLPQ/QAB		1	1	NRR/DOEA/EAB		1	1	
	NRR/DREP/EPB		1	1	NRR/DREP/RAB		1	1	
	NRR/PMAS/ILRB		1	1	NRR/PMAS/PTSB		1	1	
	REG FILE 02		1	1	RES SPEIS, T		1	1	
	RGN2 FILE 01		1	1					
EXTERNAL:	EG&G GROH, M		5	5	H ST LOBBY WARD		1	1	
	LPDR		1	1	NRC PDR		1	1	
	NSIC HARRIS, J		1	1	NSIC MAYS, G		1	1	
NOTES:			1	1					

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Oconee Nuclear Station	DOCKET NUMBER (2) 0 5 0 0 0 2 6 9	PAGE (3) 1 OF 0 4
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TITLE (4)
Inadequate Overpressure Protection For Auxiliary Steam Header

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 2	2 7	8 7	8 7	0 0 3	0 0 0 3	3 0	8 7		Oconee, Unit 2		0 5 0 0 0 2 7 0
									Oconee, Unit 3		0 5 0 0 0 2 8 7

OPERATING MODE (9) N

POWER LEVEL (10) 0 9 5

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

<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)
<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.38(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)
<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.38(c)(2)	<input type="checkbox"/> 50.78(a)(2)(vii)	<input type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 366A)
<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME Philip J. North, Licensing	TELEPHONE NUMBER AREA CODE: 7 0 4 3 7 3 - 7 4 5 6
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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
B	S/A			NO					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

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

ABSTRACT:

An analysis of safety valves on steam lines to the emergency feedwater pump turbine was performed by Duke. Results indicate that a potential for overpressurization exists in the event control valves MS-126 and MS-129 are given an erroneous signal to go full open.

The root cause of this occurrence was the failure during initial design work to accurately determine the required safety valve capacity.

Immediate corrective action ensured that adequate safety valve capacity exists following a design basis event.

Sufficient ability exists to remove decay heat following the postulated overpressure event. As such, the health and safety of the public will not be affected.

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L/L

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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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)

BACKGROUND:

The auxiliary steam header is supplied with steam either from the auxiliary boiler or the Main Steam System. Main steam pressure is reduced by control valves MS-126 (6") and MS-129 (2"). There is also a 6" hand-operated bypass valve, MS-131. During startup or shutdown, with main steam pressure below approximately 200 psig, the auxiliary steam header is the only source of steam for the Emergency Feedwater Pump Turbine (EFWPT). Usually, during these times the steam demand is high, and both control valves MS-126 and MS-129 from the unit providing the steam are fully open. When the unit is on line, auxiliary steam demand is low and usually only the smaller valve, MS-129, is open.

Both MS-126 and MS-129 receive the same positioning signal from a controller and a selector station: A single erroneous signal can made both valves go wide open. A Nitrogen backup is provided to operate these valves in the event of a loss of air. In addition, these valves will fail closed on loss of power and air.

DESCRIPTION OF OCCURRENCE:

During the Safety System Function Inspection (SSFI) conducted in May and June, 1986, NRC inspectors questioned the adequacy of safety valves on steam lines to the EFWPT to meet design basis events due to lack of formal calculations addressing this point.

Subsequently, an analysis of safety valves on steam lines to the EFWPT was performed by Duke. For the design basis event in the analysis of the auxiliary steam header, the main steam pressure was taken to be the same as the set pressure of the main steam safety valves, 1050 psig. The analysis examined both control valves being open or the bypass valve being wide open. In either case, the residual overpressure was not only greater than the design pressure of the system (350 psig), but even exceeded the rated pressure of valves and other components. Thus, the auxiliary steam header safety valve AS-23 possesses inadequate capacity to relieve overpressure within the limits of applicable codes during a design basis event in which control valves MS-126 and MS-129 are wide open. In addition, the analysis revealed a further discrepancy in that four isolation valves (1, 2, 3 AS-99 and 1 AS-156) possess an inadequate pressure rating (150 lbs). Whether a failure would occur depends on the margin of safety between this overpressure and the pressure at which the components fail.

If the path from the auxiliary steam header to the EFWP turbine is open, the steam line to the turbine can be overpressured in spite of safety valve MS-92. Excessive pressure could force the turbine and/or valves 1, 2, 3 MS-99 or 1 MS-156 to fail and could cause the active failure of pipe, valves, or other components. This could lead to not only loss of the EFWP turbine, but injury to personnel.

CAUSE OF OCCURRENCE:

The root cause of this event is the failure during initial design work to accurately determine the required safety valve capacity. As a result of this failure, the specified safety valve capacity was inadequate.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

CORRECTIVE ACTION:

The immediate corrective actions were to:

- o Close valves such that only one unit supplied main steam to the auxiliary steam header. For that particular unit, manual bypass valve MS-131 was administratively maintained closed. Also administratively maintained closed was MS-125, the isolation valve for control valve MS-126. Control valve MS-129 was left in service.
- o On the two units not supplying main steam to the auxiliary steam header, control valves MS-126 and MS-129 were isolated by administratively maintaining closed MS-125 and MS-128, the respective block valves. Valve MS-131 was also administratively maintained closed.

The following steps were implemented together as an interim measure until permanent corrective actions are determined and installed:

- o Install travel stops on control valves MS-126 to limit valve stroke to 1-1/4", with an allowable tolerance of +1/16" and -1/4". This will maintain system overpressure within applicable code limits, yet permit a combined flow rate of at least 150,000 lb/hr through both MS-126 and MS-129 under normal inlet steam conditions to start up a unit in a reasonable time period.
- o Maintain open AS-5 and 2AS-5, the auxiliary steam header section block valves between the units. Also maintain open valves 1, 2, 3 AS-38, the isolation valves between the auxiliary steam header and safety valves 1, 2, 3 MS-92. This assures a flow path to all six existing safety valves.
- o Maintain closed manual bypass valves 1, 2, 3 MS-131. Also isolate control valves MS-126 and MS-129 for two units, leaving the set of control valves for only one unit to supply the entire auxiliary steam header (currently Unit 2 is supplying the header).

In addition, operators were issued a training package and operational guidance to prevent occurrence of the overpressure event.

Permanent corrective actions are currently under design review.

SAFETY ANALYSIS:

Overpressurization of the auxiliary steam header and EFWPT could occur only if the controller for valves MS-126 and MS-129 erroneously sends a signal for these valves to go full open. These valves will fail closed in the event of a loss of power and air to the valves. In addition, MS-126 and MS-129 can be operated with a backup Nitrogen supply.

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

In the event of the loss of the EFWPT, two motor-driven EFW pumps provide the ability to remove decay heat. However, these pumps, too, would be lost in the event of a total station blackout. Decay heat can still be removed with the Auxiliary Service Water System, and the unit in question can be maintained at hot shutdown conditions with the Standby Shutdown Facility ASW System.

As sufficient ability exists to remove decay heat after the postulated overpressure event, the health and safety of the public will not be affected.

DUKE POWER COMPANY

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HAL B. TUCKER
VICE PRESIDENT
NUCLEAR PRODUCTION

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March 30, 1987

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
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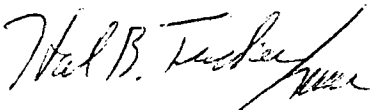
Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287
LER 269/87-03

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a) (1) and (d), attached is Licensee Event Report (LER) 269/87-03 concerning inadequate overpressure protection for the auxiliary steam header.

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

Very truly yours,



Hal B. Tucker

PJN/55/sbn

Attachment

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