NRC Form 366 (9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Oconee Nuclear Station, Unit 1	0 5 0 0 0 2 6 9	1 OF 0 3

TITLE (4)

Reactor Trip During A Divergent Secondary Pressure Swing

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 5 0 0 0
0 4	1 1	8 5	8 5	–	0 0 6	–	0 0	0 5	1 3	8 5		0 5 0 0 0

OPERATING MODE (9)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
	20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10) 0 1 7	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)	50.72(b)(2)(ii)
	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
S. G. Godwin, Licensing	7 0 4 3 7 3 – 2 3 6 2

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 fifteen single-space typewritten lines) (16)

On April 11, 1985 at 2246 hours, Oconee Unit 1 tripped from 17% Full Power (FP). The trip occurred during a divergent secondary pressure swing. The swings caused a decrease in feedwater (FDW) flow to the steam generators (SGs) which resulted in a high Reactor Coolant System (RCS) pressure. The reactor tripped on high RCS pressure approximately 2 minutes after the divergent secondary pressure swing began.

The immediate corrective action was to stabilize the unit at hot shutdown conditions. The supplemental corrective action was to investigate the cause of the pressure swings.

The investigation revealed that the steam pressure oscillations were initiated when the turbine control was transferred from manual to automatic mode.

It is known for Oconee, that when the turbine is controlling header pressure only, in automatic mode and simultaneously several other Hand/Auto stations of the Integrated Control System are in manual mode the pressure control can be unstable. This instability is more likely to occur at low power levels.

There were no abnormal releases of radioactivity and the health and safety of the public were not affected. The unit was restarted and reached 100% FP at 1352 hours on April 12, 1985.

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

DESCRIPTION OF OCCURRENCE:

On April 11, 1985 at 1228 hours, Oconee Unit 1 tripped from 100% FP due to a problem in the Electrohydraulic Control (EHC) system (Refer to LER 269/85-005 for a description of that event). During the Unit 1 restart following the recovery from previous trip, the FDW pump minimum recirculation system was being used due to low demand for FDW to the SGs. There was a FDW pressure swing of approximately 15 psi across the FDW startup valves during the restart. Therefore, an attempt was made to put the feedwater pump control stations in the ICS in automatic. This caused the swings to worsen, so the stations were maintained in manual.

The restart continued and the turbine was put on line at 10% FP. When power had reached 17% FP, the power escalation was stopped so the ICS turbine pressure master could be put in automatic. The turbine header pressure setpoints were adjusted to equal the actual turbine header pressure, and the ICS turbine pressure master was placed in automatic.

When the station was placed in automatic, divergent steam pressure swings started almost immediately causing the feedwater flow to oscillate as well.

The pre-existing feedwater swings due to the recirculation line may have contributed to the header pressure oscillation.

As the FDW swing increased, the FDW flow to the SGs decreased. This caused RCS pressure to increase and at 2246 hour the reactor tripped on high RCS pressure. When the unit tripped, the turbine bypass valves were placed in automatic to control the header pressure. After the trip, main steam relief valves (MSRVs) 3 and 10 did not reseat properly, so main steam pressure was decreased to 840 psi. Once the valves reseated, the header pressure returned to normal and the MSRVs remained shut.

During the trip recovery, 1HP-26 was opened at 2253 hours to help maintain RCS inventory. 1HPIP 'A' was manually started to ensure sufficient RCP seal flow. Approximately 2 minutes after starting the second HPIP, the pressurizer level had been regained. 1HPIP 'A' was then stopped and 1HP-26 was closed.

Investigating of the cause for the turbine header pressure swing began at 2300 hours. During this investigation the unit was restarted. At 0057 hours on 4/12/85 the reactor was critical. At 0234 the turbine generator breaker was closed in.

At 0332 hours the ICS turbine pressure master was placed in automatic. The secondary swings recurred so the station was placed back in manual. An operator was then assigned to maintain control of the turbine header pressure until the problem was solved. All other ICS stations were placed in automatic and the power escalation continued.

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

At 0350 hours the FDW pump minimum recirculation control valves were isolated and the FDW pump discharge valve ΔP stabilized. There was no longer a secondary swing. At 0421 hours the ICS turbine pressure master was placed in automatic. All controls operated properly and no swings resulted. Power escalation then continued and the unit reached 100% FP at 1352 hours.

CAUSE OF OCCURRENCE:

The cause of the reactor trip was divergent pressure swing on the secondary side as a result of the turbine header pressure control instabilities.

A review of past incident reports indicates that there have not been any reactor trips due to this system in the past, therefore this is not a recurring event.

ANALYSIS OF OCCURRENCE:

The unit was stabilized at hot shutdown conditions after the trip. There were no Engineering Safeguard actuations. There was no Emergency Feedwater actuation. The Pressurizer relief valves were not challenged. The Technical Specification maximum cooldown rate of 50°F per ½ hour was not approached. Main steam pressure had to be dropped to approximately 840 psi to reseat MSRVs 3 and 10. The Pressurizer level reached a minimum of 110 inches. To stabilize the Pressurizer level, 1HP-26 was opened and 1HPIP 'A' was started. Primary pressure reached a minimum of approximately 1900 psi before being brought back up and stabilized at approximately 2100 psi. Steam generators' levels dropped below 25 inches and stabilized. There was no indication of a dry-out condition in either steam generator. No Technical Specifications were exceeded, and the health and safety of the public were not affected.

CORRECTIVE ACTION:

The immediate corrective action was to stabilize the unit at hot shutdown conditions. An investigation was initiated to determine the cause for turbine header pressure control to swing. In addition, FDW pump minimum recirculation valves were isolated until modifications can be made.

DUKE POWER COMPANY
P.O. BOX 33189
CHARLOTTE, N.C. 28242

HAL B. TUCKER
VICE PRESIDENT
NUCLEAR PRODUCTION

TELEPHONE
(704) 373-4531

May 13, 1985

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

Subject: Oconee Nuclear Station, Units 1, 2 and 3
Docket Nos. 50-269, -270, -287
LER 269/85-06

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a) (1) and (d), attached is Licensee Event Report 269/85-06 concerning a Unit 1 reactor trip during a divergent secondary pressure swing. This report is submitted in accordance with §50.73(a)(2)(iv) and §50.72(b)(2)(ii). This event was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

Hal B. Tucker

Hal B. Tucker

SGG:slb

Attachment

cc: Dr. J. Nelson Grace, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Ms. Helen Nicolaras
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

American Nuclear Insurers
c/o Dottie Sherman, ANI Library
The Exchange, Suite 245
270 Farmington Avenue
Farmington, CT 06032

INPO Records Center
Suite 1500
1100 Circle 75 Parkway
Atlanta, Georgia 30339

Mr. J. C. Bryant
NRC Resident Inspector
Oconee Nuclear Station

M&M Nuclear Consultants
1221 Avenue of the Americas
New York, New York 10020

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