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 3	0 5 0 0 0 2 8 7	1 OF 0 4

TITLE (4): Anticipatory Reactor Trip

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 8	1 4	8 4	8 4	0 0 5	0 0	0 9	1 4	8 4		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9): 1
POWER LEVEL (10): 1 0 0

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)
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)	
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)
Paul F. Guill - Nuclear Engineer - Licensing	7 0 4 373-2844

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
A	D L	P S P							

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) X NO

EXPECTED SUBMISSION DATE (15): MONTH DAY YEAR

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

On August 14, 1984 at 1126 hours, Unit 2 tripped from 100% Full Power (FP) when the instrument air line to the Powdex outlet valves was accidentally sheared. The loss of air to the outlet valves caused the valves to fail shut which resulted in a loss of condensate flow to the condensate booster (CB) pumps. The CB pumps tripped and caused the main feedwater (MFDW) pumps to trip on low-suction pressure. The loss of the MFDW pumps initiated a reactor anticipatory trip.

Approximately 16 minutes after the trip, the "3A" MFDW pump was restarted to re-establish MFDW flow. The Emergency Feedwater (EFDW) control valves, 3FDW-315, 316, closed on an indication of 750 psig discharge pressure from the "3A" MFDW pump as designed. The Once Through Steam Generator's (OTSG's) were isolated from all feedwater flow for approximately 9 minutes as a result of the automatic closing of the EFDW control valves and lack of MFDW flow due to insufficient discharge pressure from 3A MFDW pump.

The immediate corrective action was to stabilize the unit in a hot shutdown condition using Emergency Feedwater (EFDW). The immediate corrective action to restore feedwater flow to the OTSG was to manually open the EFDW control valves and to increase 3A MFDW pump speed. The sheared air line was repaired.

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 0100 on August 17, 1984.

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Description of Occurrence:

a) Reactor trip event - At approximately 1127 hours on August 14, 1984, Oconee 3 tripped from 100% Full Power (FP). The unit was operating at steady state conditions when the instrument air (IA) line to the Powdex outlet valves was accidently sheared.

The loss of IA to the Powdex outlet valves caused the valve operators to fail closed which isolated the Powdex system. The isolation of the Powdex system created a loss of flow to the Condensate Booster (CB) pumps. The CB pumps tripped on a loss of suction and created a loss of flow to the Main Feedwater (MFDW) pumps. The MFDW pumps tripped on loss of suction and initiated an anticipatory Reactor trip. The unit tripped at 1126:51 on indication of both MFDW pumps tripping.

The motor driven emergency feedwater (MDEFDW) pumps and the turbine driven emergency feedwater (TDEFDW) pumps started on the loss of the MFDW pumps. The steam generator (SG) level was established at 25 inches by emergency feedwater approximately five minutes after the trip.

The restart of Unit 3 was delayed due to maintenance activities unrelated to this event. The unit was restarted and reached 100% FP at 0100 on August 17, 1984.

b) Post-trip feedwater control event - During the post-trip recovery, as the operators attempted to restore MFDW flow to the steam generators, EFDW flow was interrupted. The operators reset and started the 3A MFDW pump which caused the EFDW control valves to close when the MFDW pump discharge pressure increased above 750 psig. However, discharge pressure was still insufficient to put water into the SG's. The EFDW control valves had not been placed in manual control, as specified by procedure, prior to resetting the MFDW pump. As a result, level in both steam generators decreased to 12 inches indicated. Primary temperature increased from 555°F to 575°F over 6 minutes. Primary system pressure was maintained below 2200 psig by the pressurizer spray system. The operators observed the increasing primary temperature and manually opened the EFDW control valves. Primary temperature began to decrease and stabilized at 555°F 10 minutes later. The maximum pressurizer level during this period was 300 inches (400 inch scale).

Cause of Occurrence:

a) Reactor trip event - This incident was caused by the accidental shearing of the instrument air (IA) line supplying the operators on the Powdex outlet valves. The IA line was bent during work on a pipe above the IA line. The IA line was sheared when an attempt was made to straighten the bend. When the damage occured, the Powdex outlet valves failed closed and condensate flow to the condensate booster (CB) pumps was abruptly reduced causing the CB pumps and subsequently the MFDW pumps to trip and initiating a reactor anticipatory trip.

b) Post-trip feedwater control event - The operators were following emergency procedure for loss of steam generator feedwater. A procedure step describing the restart of a main feedwater pump has a caution statement alerting the operator that FDW-315 and FDW-316 must be placed in manual prior to resetting MFDW pumps. However, the caution statement is located below the step so that the operator overlooked it. He did not read the entire step before starting his actions.

The EFDW control logic is designed to initiate automatic SG level control at 25 inches upon starting the EFDW pumps. The actuation signals are 75 psig (decreasing) hydraulic oil presure or 750 psig (decreasing) feedwater discharge pressure on both MFDW pumps. In the increasing direction the same setpoints will transfer FDW-315 and FDW-316 from automatic level control to the manual mode. Since the manual loader is normally set in the closed position the EFDW valves went closed.

Analysis of Occurrence:

a) Reactor trip event - The unit was stabilized at hot shutdown condition after the trip. All Integrated Control Systems (ICS) stations were in auto and responded appropriately. There were no Engineering Safeguard (ES) actuations. Emergency feedwater (EFDW) actuation was as expected for a loss of Main Feedwater (MFDW) pumps. The Pressurizer relief valves were not challenged. The Technical Specification maximum cooldown rate of 50°F/½ hr was not approached. Pressurizer level reached minimum of approximately eighty (80) inches and then stabilized. Main steam pressure stabilized at approximately one thousand (1000) psig. Primary pressure and temperature reached a maximum of 2150 psig and 575°F before stabilizing. Steam generator levels stabilized at 25 inches before decreasing to approximately 12 inches on 3A MFDW pump restart and then stabilizing at 25 inches.

A steam generator tube leak of approximately 0.025 gpm was present at the time of the trip. Calculations for worst case releases through the main steam relief valves indicated that:

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

1. For noble gases, the release was 3% of the 500 mrem/year limit allowed by Technical Specifications.
2. For iodines, the release was 1% of the 1500 mrem/year limit allowed by Technical Specifications.

No technical specifications or reporting criteria were exceeded. The health and safety of the public was not affected.

b) Post-trip feedwater control event - As a result of the EFDW control valves closing, the steam generators approached dry-out conditions. Indications of 12 inches SG level, increasing primary temperature, and decreasing steam pressure were observed for the B steam generator. Steam pressure decreased approximately 50 psi. Prompt operator action to restore EFDW flow terminated the pressure decrease. No decrease in pressure occurred in SG A. Because feedwater flow was quickly restored, fully dry conditions were not reached. The primary system heatup was limited to 20°F while primary pressure was controlled by spray alone - no relief valves lifted.

Corrective Action:

a) Reactor trip event - Immediate corrective action was taken and the unit was stabilized in hot shutdown conditions. The cause of the trip was determined and the sheared instrument air (IA) line was repaired. Main feedwater flow was regained and emergency feedwater flow was secured. The personnel involved with the shearing of the IA line were counselled. The unit was restarted and reached 100% full power at 0100 on August 17, 1984.

b) Post-trip feedwater control event - The response of the EFDW control valves after the MFDW pump was restarted is under evaluation. The need for changes in the control logic will be evaluated. Procedures will be reviewed to determine if any changes are necessary to assure proper restarting of MFDW pumps.

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VICE PRESIDENT
NUCLEAR PRODUCTION

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September 14, 1984

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U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Subject: Oconee Nuclear Station, Unit 3
Docket No. 50-287
LER 287/84-05

Pursuant to 10 CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report 287/84-05 concerning a Unit 3 anticipatory Reactor trip which is submitted in accordance with §50.73(a)(2)(iv). Initial notification of this event was made (pursuant to §50.72 Section (b)(2)(ii)) with the NRC Operations Center via the ENS on August 14, 1984. 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

MAH:slb

Attachment

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