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MAR 27 2003

L-2003-061
10 CFR § 50.73

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

Re: Turkey Point Unit 3
Docket No. 50-250
Reportable Event: 2003-002-00
Date of Event: January 27, 2003
Manual Reactor Trip due to
Low Steam Generator Level

The attached Licensee Event Report 250/2003-002-00 is being submitted pursuant to the requirements of 10 CFR § 50.73(a)(2)(iv)(B)(1).

If there are any questions, please call Olga Hanek at (305) 246-6607.

Very truly yours,

William Jefferson, Jr.
Vice President
Turkey Point Nuclear Plant

OH

Attachment

cc: Regional Administrator, USNRC, Region II
Senior Resident Inspector, USNRC, Turkey Point Nuclear Plant

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NRC FORM 366 (7-2001)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO. 3150-0104 EXPIRES 7-31-2004 Estimated burden per response to comply with this mandatory information collection request 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)		

1. FACILITY NAME Turkey Point Unit 3	2. DOCKET NUMBER 05000 0250	3. PAGE 1 OF 4
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4 TITLE
Manual Reactor Trip due to Low Steam Generator Level

5 EVENT DATE			6 LER NUMBER			7. REPORT DATE			8 OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
01	27	2003	2003	02	00	03	27	03		

9. OPERATING MODE	1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)								
10. POWER LEVEL	100	20 2201(b)			20.2203(a)(3)(ii)			50.73(a)(2)(ii)(B)		50 73(a)(2)(ix)(A)
		20 2201(d)			20.2203(a)(4)			50 73(a)(2)(iii)		50 73(a)(2)(x)
		20 2203(a)(1)			50.36(c)(1)(i)(A)			50 73(a)(2)(iv)(A)		73 71(a)(4)
		20 2203(a)(2)(i)			50.36(c)(1)(ii)(A)			50 73(a)(2)(v)(A)		73 71(a)(5)
		20 2203(a)(2)(ii)			50.36(c)(2)			50 73(a)(2)(v)(B)		OTHER Specify in Abstract below or in NRC Form 366A
		20 2203(a)(2)(iii)			50 46(a)(3)(ii)			50 73(a)(2)(v)(C)		
		20 2203(a)(2)(iv)			50 73(a)(2)(i)(A)			50 73(a)(2)(v)(D)		
		20 2203(a)(2)(v)			x 50.73(a)(2)(i)(B)			50 73(a)(2)(vii)		
20 2203(a)(2)(vi)			50.73(a)(2)(i)(C)			50 73(a)(2)(viii)(A)				
20 2203(a)(3)(i)			50 73(a)(2)(ii)(A)			50 73(a)(2)(viii)(B)				

12. LICENSEE CONTACT FOR THIS LER	
NAME Olga Hanek – Licensing Engineer	TELEPHONE NUMBER (Include Area Code) (305) 246-6607

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT									
CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

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

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

On January 27, 2003, with the unit operating at approximately 100% reactor power, Unit 3 was manually tripped due to low steam generator level on the C steam generator. The low steam generator level was caused by a momentary loss of running instrument air compressors. The degraded instrument air pressure affected the air-operated main feedwater control valves, causing them to drift closed. The Control Room Operator took prompt procedurally driven actions to reduce power in response to the transient and to manually load the diesel driven instrument air compressors. Steam generator levels decreased, with the 3C steam generator level reaching approximately 12 percent, when the Unit 3 Control Room Operator initiated the manual trip of the unit. Following the manual reactor trip, all three turbine-driven auxiliary feedwater pumps started as expected and instrument air was restored. All control rods fully inserted. The plant was stabilized in Mode 3. This event is reported per the requirements of 10CFR50.73(a)(2)(i)(B).

The cause of this event was a failure of the 4CM motor driven instrument air compressor, with the 3CM compressor out of service for maintenance. A contributing cause was the failure of the 3CD and 4CD diesel-driven compressors to autoloading. Corrective actions included the installation of temporary instrument air compressors. Evaluation of the 4CM motor driven compressor failure and the 3CD and 4CD diesel-driven instrument air compressors failure to autoloading is still under investigation.

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

Event Description

On Monday, January 27, 2003, at approximately 0842 hours, a momentary loss of the running Instrument Air (IA) [LD:CPU] compressors occurred. The degraded instrument air pressure affected the steam generator [AB:sg] air-operated main feedwater control valves [SJ:fcv] causing them to drift closed. The Control Room Operator took prompt procedurally driven actions to reduce power in response to the transient and to manually load the diesel driven instrument air compressors. Steam generator levels decreased, with the 3C steam generator level reaching approximately 12 percent. A contributing factor to the 3C steam generator reaching this low level was the sluggish response of the turbine generator load limiter which may have delayed the power reduction. At 0845 hours, Unit 3 was manually tripped due to low steam generator level on the C steam generator. Following the manual reactor trip, all three turbine-driven auxiliary feedwater pumps started as expected and instrument air pressure was restored. All control rods fully inserted. The plant was stabilized in Mode 3. Unit 4 continued in Mode 1 operation.

Background

The Instrument Air (IA) System is a common system to Units 3 and 4, with 4 compressors; two motor driven (3CM for Unit 3 and 4CM for Unit 4) and two diesel driven compressors (3CD for Unit 3 and 4CD for Unit 4). Each unit has its own instrument air supply system comprised of one motor driven and one diesel driven compressor. The two (2) units' systems are normally cross-connected through a 4 inch cross-tie line, with a low pressure isolation feature. The IA system uses the motor driven compressors (3CM and 4CM) for its normal source of compressed air with the two compressors operating LEAD/LAG such that upon loss of pressure in one Unit, the opposite Unit's motor driven compressor will load and provide compressed air as required. Each diesel-driven compressors (3CD and 4CD) will start on a low-low air receiver tank pressure, a low voltage on the power busses to the motor driven compressors, or from a manual start switch at the compressor panel.

Sequence of Events

Prior to the event, the 3CM IA compressor was out of service for maintenance. The 4CM IA compressor was running in lead prior to the event. At 0840 hours, on January 27, 2003, the 4CM IA compressor tripped on thermal breaker overload. Both the 3CD and 4CD IA diesel-driven compressors attempted to autoloading but tripped. The local annunciator panel indicated low compressor oil pressure. Operations manually restarted both 3CD and 4CD IA diesel-driven compressors and pressure in the IA system was restored. The degraded IA pressure affected the main feedwater control valves causing them to drift closed. Operations initiated a manual turbine load reduction in response to the reduction in main feedwater flow, caused by the repositioning of the main feedwater control valves. Unit 3 was manually tripped when the 3C SG reached a level of approximately 12%. A contributing factor to the 3C steam generator reaching this low level was the sluggish response of the turbine generator load limiter which may have delayed the power reduction. The main turbine [TA] automatically tripped in response to the manual reactor trip. All rods [AA:rod] inserted, all systems responded as designed and instrument air pressure was restored. Unit 3 was stabilized in Mode 3 (Hot Standby) with decay heat being removed through the steam dump to atmosphere. Unit 3 was returned to 100% power at 0200 hours on January 31, 2003. Since the IA system is common to both units, Unit 4 was also affected by the momentary degradation of IA pressure. Unit 4 reactor operators responded to the reduction in Unit 4 main feedwater flow by initiating a manual turbine power reduction. The 4B steam generator level

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reached a minimum of 24%. Unit 4 was stabilized at approximately 89% reactor power after IA was recovered. Unit 4 was returned to 100% reactor power at 1400 hours on January 27, 2003.

This event is reported per the requirements of 10CFR50.73(a)(2)(i)(B) due to a manual reactor trip.

Causes of Event

The cause of this event was a failure of the 4CM motor driven instrument air compressor. The 4CM IA compressor motor seized. The failure of the 4CM motor driven instrument air compressor is still under investigation. The postulated cause of the failure was two loose screws from an internal air baffle in the motor making contact with the motor windings causing the motor to short out. The 4CM IA compressor had never been disassembled for maintenance; therefore, the cause of the loose screws is attributed to a manufacturing problem. A supplement to this Licensee Event Report will be submitted when the investigation is complete.

A contributing cause of the event was the failure of the 3CD and 4CD diesel-driven compressors to autoloading as designed. These compressors are the installed backup to the 3CM and 4CM IA motor driven compressors. The autoloading failure of the 3CD and 4CD diesel-driven instrument air compressors is still under investigation. Both compressors received the start signal but failed to autoloading. The local annunciator panel indicated compressor low oil pressure. A supplement to this Licensee Event Report will be submitted when the investigation is complete.

A contributing factor to the 3C steam generator reaching 12% was the sluggish response of the turbine generator load limiter which may have delayed the power reduction.

Analysis of Safety Significance

In the January 27, 2003 event, the momentary loss of the running instrument air compressor affected the main feedwater control valves causing them to drift closed. A manual turbine load reduction was initiated to reduce the steam generator feedwater flow/steam flow mismatch caused by the drift of the steam generator main feedwater control valves. The event was a reduction of normal feedwater flow and is bounded by the total loss of normal feedwater flow event analyzed in the Updated Final Safety Analysis Report (UFSAR)(Section 14.1.11.1).

The UFSAR analysis assumes a total loss of normal feedwater to all steam generators, due to the loss of the non-safety feedwater pumps or valve malfunction. A total loss of normal feedwater results in a reduction in capability of the secondary system to remove heat generated in the reactor core. In the January 27 event, feedwater flow was not lost completely; therefore, an automatic turbine runback due to loss of a main feedwater pump did not occur. A manual turbine load reduction was initiated by the reactor operator in accordance with Off-Normal Operating Procedures. All steam generators were affected by the reduction in feedwater flow. In the analysis, the reactor trip is expected to occur due to a Low-Low Level in any steam generator or Steam/Feedwater Flow Mismatch Coincident with Low Level in any steam generator. In the January 27, 2003 event, neither trip occurred, since operator actions manually tripped the reactor prior to reaching the steam generator Low-Low Level setpoint or the Steam/Feedwater Flow Mismatch Coincident with Low Level setpoint in any steam generator. The analysis does not credit turbine runback as a result of the loss of a feedwater pumps or valve malfunction. The analysis shows that following a loss of normal feedwater, the Auxiliary Feedwater (AFW) System is capable of removing the stored and residual heat, thus preventing

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either overpressurization of the reactor coolant system or loss of water from the reactor core. The analysis also assumes only one AFW pump is available due to a single active failure. In this event the AFW system automatically actuated on steam generator Low-Low level and all three AFW pumps started as designed. The plant's response was bounded by the UFSAR analysis. Thus, this event did not compromise the health or safety of plant personnel or the general public.

Corrective Actions

The following corrective actions have been completed:

1. Temporary instrument air compressors, consisting of two diesel driven portable air compressors for each unit, were installed under the Temporary System Alteration Process.
2. The 3CM and 4CM motor driven compressors were repaired and returned to service.
3. The load limiter was inspected, aligned and returned to service.

The following corrective actions will be completed:

1. The root cause of the failure of the 4CM motor driven instrument air compressors is being investigated.
4. The root cause of the failure of the 3CD and 4CD diesel-driven compressors is being investigated.

Additional Information

There are no other events reported related to degraded instrument air pressure.

EIIS Codes are shown in the format [EIIS SYSTEM: IEEE component function identifier, second component function identifier (if appropriate)]. There have been no previous similar events at Turkey Point Units 3 and 4.