



FPL

MAY 13 2005

10 CFR § 50.73
L-2005-097

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

Re: Turkey Point Unit 4
Docket No. 50-251
Reportable Event: 2005-001-00
Date of Event: March 22, 2005
Steam Generator Feedwater Pump Trip Leading to Manual Reactor Trip
And Auxiliary Feedwater Actuation

The attached Licensee Event Report 50-251 / 2005-001-00 is being submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(iv)(A) to provide notification of the subject event.

If there are any questions, please call Mr. Walter Parker at (305) 246-6632.

Very truly yours,

Terry O. Jones
Vice President
Turkey Point Nuclear Plant

Attachment

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

LICENSEE EVENT REPORT (LER)

Estimated burden per response to comply with this mandatory 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 and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to infocollects@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 an 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.

1. FACILITY NAME Turkey Point Unit 4	2. DOCKET NUMBER 05000251	3. PAGE 1 OF 4
--	-------------------------------------	--------------------------

4. TITLE
Steam Generator Feedwater Pump Trip Leading to Manual Reactor Trip and Auxiliary Feedwater Actuation

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
3	22	2005	2005	- 001 -	00	05	20	2005	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)									
10. POWER LEVEL 100	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)						
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)						
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)						
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)						
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)						
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER							
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A							

12. LICENSEE CONTACT FOR THIS LER

NAME Ron Everett - Licensing Engineer	TELEPHONE NUMBER (include Area Code) 305-246-6190
---	---

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
B	SJ	MO	G080	Y					

14. SUPPLEMENTAL REPORT EXPECTED <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
--	-------------------------------------	-------	-----	------

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

On March 22, 2005, at 0346 hours the 4A Steam Generator Feed Pump (SGFP) tripped on over-current due to a fault within the pump motor. As a result, a turbine runback from 100% power to 78% power occurred and Steam Generator levels decreased to 15%. At that time, the reactor was manually tripped in accordance with station procedures. The operating crew verified the reactor and turbine were tripped, and that emergency power to the 4 KV buses and safety injection were not required. The plant was verified to be stable prior to transitioning from power operation to hot standby.

All control rods inserted as expected. Auxiliary Feedwater automatically actuated as expected when Steam Generator narrow range levels decreased below 10%. Plant systems functioned as designed to remove heat and safely shut down the reactor. The health and safety of the public were not affected by this event.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Turkey Point Unit 4	05000251	2005	001	00	Page 2 of 4

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

DESCRIPTION OF THE EVENT

On March 22, 2005, at 0346 hours the 4A Steam Generator Feed Pump (SGFP) [EIIS: SJ, P] tripped on over-current due to a fault within the pump motor. As a result, a turbine runback from 100% power to 78% power occurred and Steam Generator [EIIS: AB, SG] levels decreased to 15%. At that time, the reactor was manually tripped in accordance with station procedures. The operating crew verified the reactor and turbine were tripped, and that emergency power to the 4 KV buses and safety injection were not required. The plant was verified to be stable prior to transitioning from power operation to hot standby.

All control rods inserted as expected. Auxiliary Feedwater [EIIS: BA] automatically actuated as expected when Steam Generator narrow range levels decreased below 10%. The turbine [EIIS: SB, TRB] runback reduced the energy removal rate from the secondary side of the plant. This initially resulted in elevated Reactor Coolant System (RCS) [EIIS: AB] temperatures and resulted in an increase in the pressurizer [EIIS: AB, PZR] pressure and level and decrease in steam generator levels. Secondary system steam relief was achieved via atmospheric dump valves [EIIS: SB, V] and steam dump valves [EIIS: SB, V] to the condenser [EIIS: SG, COND]. Once steam generator levels recovered, auxiliary feedwater flow was throttled back and subsequently secured in accordance with station procedures. Plant systems required for safe shutdown of the plant functioned as designed. There were no safety systems out of service prior to the event. All plant parameters responded within the design envelope for this type of transient.

ANALYSIS OF THE EVENT

At the time of the event, the plant was in Mode 1 at 100% power. The design basis Loss of Normal Feedwater Flow Event is analyzed in UFSAR section 14.1.11. The event is described in the UFSAR as a reduction in capability of the secondary system to remove heat generated in the reactor core. If an alternate supply of feedwater were not supplied to the plant, core residual heat following reactor trip could heat the reactor coolant to the point where water relief from the pressurizer would occur, resulting in a loss of inventory from the Reactor Coolant System. For this particular event, the initial conditions were well within the assumed condition of the Loss of Normal Feedwater Flow event analyzed in the UFSAR. Only one train of normal feedwater was lost and the auxiliary feedwater system actuated and served to maintain steam generator levels. UFSAR minimum and maximum analyzed values were not exceeded during this transient. The Auxiliary Feedwater System auto-initiated as required, due to the expected decrease in steam generator levels below 10% narrow range. The RCS pressure remained below the setpoint for pressurizer PORV or Code safety valve actuation.

Plant systems functioned as designed with some minor secondary side equipment performance exceptions and some minor primary side indication and alarm performance exceptions. These exceptions had no adverse effect on the operating crews' ability to safely shutdown the reactor and stabilize the plant. This event did not adversely affect the health and safety of the public.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Turkey Point Unit 4	05000251	2005	001	00	Page 3 of 4

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

CAUSE OF THE EVENT

The 4A Steam Generator Feed Pump motor breaker tripped on instantaneous over-current due to a motor failure. This initiated a turbine runback and decreasing steam generator water levels, which lead to Unit 4 being manually tripped. The motor, a General Electric, 7000 HP, 2 Pole, 4000 Volt, Frame 8611s, was last overhauled in 2002. During that overhaul, the motor leads were found to be degraded and were replaced. During the lead replacement, the existing 250 MCM flexible multi-strand motor leads were spliced to lead extensions which were a stiffer 250 MCM Cable. The connection of multi-strand wire to the stiffer MCM cable was a non-standard connection.

The motor was subjected to failure analysis through disassembly and inspection. One cable (terminal #2) had partially melted the connector tubing on the side of the original flexible motor cable and approximately one half inch of copper wires was melted. The terminal #3 cable had signs of an explosive short circuit that flared the cable strands of copper wire. An apparent tracking flashover area was located around 10 o'clock on the winding head where an arc had occurred. Both failures on the cables were located on the side of the original equipment manufacturer (OEM) motor cable, close to the splice connection. The cause of the failure is an improper splice that resulted in mechanical vibration of the motor leads that fractured the heat damaged strands due to mechanical fatigue. Potential contributing factors included: 1) superficial oil and dust contamination that developed tracking discharges around the insulated splice, leading to gradual melting of strands of copper wire and arcing; and 2) high electrical resistance due to the crimped splice connection which eventually caused heat damage. With the reduced copper cross section, a high temperature was developed melting copper wire strands until the current was conducted by plasma. The high temperature developed by the plasma melted the splice end and burnt the adjacent terminal lead cover insulation, creating an explosive phase to phase short circuit that tripped the protection relay.

REPORTABILITY

A review of the reporting requirements of 10 CFR 50.72 and 10 CFR 50.73 and NRC guidance provided in NUREG-1022, Revision 2, Event Reporting Guidelines 10 CFR 50.72 and 10 CFR 50.73, was performed for the subject condition. As a result of this review, the condition is reportable as described below.

10CFR50.73(a)(2)(iv)(A) states that the licensee shall report any event or condition that resulted in a manual or automatic actuation of any of the systems listed in 10CFR50.73(a)(2)(iv)(B). Systems to which the requirements of 10CFR50.73(a)(2)(iv)(A) apply include the Reactor Protection System (RPS) [EIIIS: JC] actuation resulting in a manual trip (10 CFR 50.73(a)(2)(iv)(B)(1). Unit 4 was manually tripped in response to decreasing steam generator levels. The event is also reportable in accordance with 10 CFR 50.73 (a)(2)(iv)(A), due to automatic AFW system actuation (10 CFR 50.73(a)(2)(iv)(B)(6)).

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Turkey Point Unit 4	05000251	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	Page 4 of 4
		2005	- 001	- 00	

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

ANALYSIS OF SAFETY SIGNIFICANCE

This event had no significant effect on the health and safety of the public. A manual reactor trip was initiated in response to the turbine runback. All safety systems operated as designed; and no unexplained aspects of this transient, when compared to the UFSAR, were noted. The auxiliary feedwater system automatically actuated. And the condenser continued to function as a heat sink and condenser steam dumps remained operable throughout this event. Post-trip reviews established that plant parameters were within UFSAR analyzed minimum and maximum values for a loss of feedwater event. No radiological release occurred. Therefore, the event had very low safety significance.

CORRECTIVE ACTIONS

Short Term – The SGFP 4A motor was removed for offsite inspection and repair.
 Long Term – The repaired motor is being replaced during the 2005 Unit 4 Cycle 22 refueling outage. In addition, the motor repair Specification E-008 will be revised to include lessons learned from this event.

ADDITIONAL INFORMATION

To evaluate the extent of condition, the maintenance history of other Unit 3 and Unit 4 SGFP motors was reviewed. None of these repairs employed a spliced connector. The terminations for the new leads went back to the coil connections in all cases.

EIIS Codes are shown in the format [EIIS SYSTEM: IEEE system identifier, component function identifier, second component function identifier (if appropriate)].

No similar events were identified.