FPL

DEC 13 2001
L-2001-278
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: 2001-004-00
Date of Event: October 16, 2001
Condition Prohibited by Technical Specifications: Boron Injection Flow Path Inoperable During Fuel Movement

The attached Licensee Event Report 250/2001-004-00 is being submitted pursuant to the requirements of 10 CFR § 50.73 to provide notification of the subject event.

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

Very truly yours,

John P. McElwain
Vice President
Turkey Point Nuclear Plant

CLM

Attachment

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

IE22
Rec'd 01/18/02

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	2. DOCKET NUMBER	3. PAGE
Turkey Point Unit 3	05000 0250	1 OF 5

4. TITLE

Condition Prohibited by Technical Specifications: Boron Injection Flow Path Inoperable During Fuel Movement

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
10	16	2001	2001	- 04 -	00	12	xx	01	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE	6
10. POWER LEVEL	0

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

	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	TELEPHONE NUMBER (Include Area Code)
Craig Mowrey, Compliance Specialist	(305) 246-6204

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

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

On October 15, 2001, Turkey Point Unit 3 was in Mode 6 (Refueling) with core reload in progress. Contrary to Technical Specification (TS) requirements, fuel movement continued without an OPERABLE boration flow path as defined by TS 3.1.2.1. The condition was discovered on October 16, 2001. Although a boric acid transfer pump was OPERABLE and capable of supplying borated water to the Reactor Coolant System through an idle charging pump, the idle charging pump was not capable of being powered by an OPERABLE emergency power source, in verbatim compliance with TS 3.1.2.1. The emergency power source for the 3A Charging Pump is the 3A Emergency Diesel Generator (EDG). The 3A EDG was paralleled to the grid, rendering it inoperable.

The root causes of this event were inadequate procedures and misinterpretation of TS 3.1.2.1. Because the emergency power source was available (even though inoperable), the safety significance and risk significance of the event were very low.

Corrective actions include revision of procedures, counseling of personnel involved, and retraining of operating personnel and other non-licensed plant staff.

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

EVENT DESCRIPTION

On the morning of October 16, Unit 3 was in Mode 6 (Refueling). The reactor core was being reloaded. The 3A Emergency Diesel Generator (EDG) [EK:dg] was paralleled to the grid for its 24-hour loaded run, in accordance with Technical Specification (TS) 4.8.1.1.2g.7. The 3B EDG was OPERABLE. The 3A Charging Pump [CB:p] was OPERABLE. The 3B and 3C Charging Pumps were aligned for recirculation in preparation for the integrated safeguards test. The boron concentration in the Reactor Coolant System (RCS) [AB] and the refueling canal was 2122 ppm (TS requirement in Mode 6 is 1950 ppm).

TS 3.1.2.1 requires that one of the following boron injection flow paths be OPERABLE and capable of being powered from an OPERABLE emergency power source in Modes 5 and 6:

a) a flow path from the Boric Acid Storage Tanks (BASTs) [CA:tk] via a Boric Acid Transfer Pump (BATP) [CA:p] and a charging pump to the RCS,or

b) a flow path from the refueling water storage tank (RWST) [BP:tk] via a charging pump to the RCS.

The technical specification requires that all core alterations or positive reactivity changes be suspended if neither of the flow paths are OPERABLE or capable of being powered from an OPERABLE emergency power source.

During the core reload process, flow path "a" of TS 3.1.2.1, as described above, was credited as providing the requisite boron injection flow path. The 3B BATP and 3A Charging Pump were aligned in standby to support RCS boration. Because the RCS was at atmospheric pressure, i.e., the BATP alone was sufficient to provide boration flow to the RCS without the need to run a charging pump, operators believed that compliance with the TS requirements was achieved without requiring an OPERABLE emergency power source to an idle charging pump.

Contrary to the requirements of TS 3.1.2.1, the 3A Charging Pump was not capable of being powered from an OPERABLE emergency power source. The emergency power source for the 3A Charging Pump is the 3A EDG. When the 3A EDG is paralleled to the grid, it is clearly available, but inoperable (for reasons discussed below). Since the 3A Charging Pump was the credited path, and since it was not capable of being powered from an OPERABLE emergency power source, TS 3.1.2.1 was not met, and core alterations should have been suspended. Since core alterations were not suspended, the unit was in a condition prohibited by technical specifications, reportable under 10 CFR 50.73 (a)(2)(i)(B).

BACKGROUND AND TIMELINE

The EDG output breaker protection schemes used for the main generator [TB:tg], main transformer [el:xfmr], and startup transformer [EA:xfmr] are original plant design. The use of these protection schemes in electrical designs such as Turkey Point's is typical of industry practice. They provide a reliable method to allow testing of an EDG while affording assurance that the EDG will be protected during adverse grid conditions. In older plants, however, these schemes are typically not safety-related, as is the case at Turkey Point. As such, they cannot be credited in establishing OPERABILITY of an EDG connected to the grid for testing. Therefore, the EDG is available, but inoperable, any time it is paralleled to offsite power during testing.

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

Late in the evening of October 14, 2001, operators aligned the 3B and 3C Charging Pumps for recirculation in preparation for the B train integrated safeguards test. The 3A Charging Pump was aligned to discharge to the RCS. Following successful completion of the full load test, the 3B EDG was declared OPERABLE at 1240 on October 15, 2001. At 1510, the 24-hour run was started on the 3A EDG, and it was declared inoperable. At the time, the 3B and 3C Charging Pumps were still aligned for recirculation. The 3A Charging Pump was aligned in standby, providing the boration flowpath to the RCS. Multiple approved plant procedures allowed this equipment lineup, which placed the plant in the prohibited condition.

On the morning of October 16, operators questioned the equipment lineup, and reaffirmed with the plant staff that the intent of the TS was met. As a conservative measure, the concern was documented in the plant's corrective action program, and the 3B Charging Pump was returned to a normal lineup later that morning.

Subsequent review determined that the equipment lineup, in existence from 1510 on October 15 until the 3B Charging Pump was returned to normal alignment at about 0730 on the morning of October 16, 2001, was not in verbatim compliance with TS 3.1.2.1.

CAUSES OF THE EVENT

Two causal factors contributed to the event: inadequate procedures and a misinterpretation of TS 3.1.2.1.

Procedure 3-OSP-201.1, "RCO Daily Logs," was less than adequate, in that it required only that the emergency power source to the charging pump be "available," rather than OPERABLE. Therefore, 3-OSP-201.1 did not adequately implement TS 3.1.2.1.

Procedure 0-OSP-023.3, "Equipment Operability Verification With an Emergency Diesel Generator Inoperable," was less than adequate, in that it did not require that the 3B and/or the 3C Charging Pump(s) be verified OPERABLE (in this case capable of supplying borated water to the RCS), prior to making the 3A EDG inoperable. Attachment 6 to this procedure allowed reliance on either a charging pump or a BATP. Therefore, it did not adequately implement TS 3.1.2.1.

Finally, FPL personnel misinterpreted TS 3.1.2.1, in that personnel believed that the ability of the BATP to supply borated water to the RCS through an idle charging pump obviated the need for the charging pump to be capable of being powered from an OPERABLE emergency power source.

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ANALYSIS OF SAFETY SIGNIFICANCE

Updated Final Safety Analysis Report (UFSAR) section 14.1.5, "Chemical and Volume Control System Malfunctions," discusses inadvertent dilution of the RCS during refueling. For dilution during refueling, the boron concentration must be reduced from greater than 1950 ppm to approximately 1400 ppm before the reactor will go critical. The rate of addition of unborated water makeup to the RCS is conservatively limited to the capacity of 252 gpm for three charging pumps. At this rate, it would take approximately 31 minutes for criticality to be reached. This is ample time for the operator to recognize the situation and act. In the actual event, 2 of the 3 charging pumps were aligned for recirculation, effectively tripling the time available. In addition, the initial boron concentration was 2122 ppm, adding more time to allow action.

During the core reload process on October 16, 2001, a boron injection path from the BAST to the RCS was available. The 3B BATP was at all times capable of being powered from an OPERABLE emergency power source. Although the 3A Charging Pump was not capable of being powered from an OPERABLE emergency power source (although available), the 3B BATP was still capable of delivering boric acid through an idle charging pump to the RCS. In addition, the sources of primary (unborated) water were isolated in accordance with surveillance requirement 4.9.1.3.

The Action Statement of TS 3.9.1 requires boration at greater than or equal to 16 gpm. As shown below, at least 50 gpm was available from just the BATP.

TS 3.1.2.4 requires that the boron concentration in the BAST be maintained between 5245 and 6119 ppm in Mode 6. The BAST boron concentration was within its TS boron concentration limits during the event.

The capability of the 3B BATP to provide a viable boration flow under similar conditions (RCS depressurized without an operating charging pump) has been confirmed by actual plant testing and by independent engineering assessment. For example, the boric acid transfer flow test, performed on October 15 under similar conditions, demonstrated that the 3B BATP was capable of providing 65 gpm to the core without an operating charging pump.

For added assessment, a computer model of the flow path was constructed using the AFT Fathom software. The model confirmed that a BATP would provide approximately 50 gpm to the RCS if operated under the conditions that existed during the core reload. The flow model also indicated that BATP discharge pressure would seat the Volume Control Tank (VCT) [CB:tk] outlet check valve such that the total 50 gpm flow would be delivered from the BAST, through the BATP and idle charging pump, to the RCS.

During the time in question, the 3A EDG was paralleled to the 3A 4.16 kV bus during a 24-hour test run. If it had been required, the 24-hour test could have been quickly terminated, and the EDG placed in an OPERABLE configuration by manual operator action. This would have resulted in the 3A Charging Pump having an OPERABLE emergency power source. Had a loss of offsite power occurred during the test, a manual action to reset an EDG lockout signal would have been required prior to re-energizing the 3A 4.16 kV bus from the EDG. The 3B and 3C charging pumps were both aligned in a recirculation flow path to the VCT. Simple local manual actions to reposition two valves would have re-established 3B or 3C Charging Pump flow to the RCS.

The low safety significance of the event is further supported by the absence of similar TS requirements in the current Standard Technical Specifications. Requirements for boration flow paths existed in NUREG 0452, from which Turkey Point's technical specifications derive, but were removed from NUREG 1431.

The above flow test and computer model confirm that the existing alignment provided a boric acid injection path to the RCS, even without an OPERABLE emergency power source for the 3A charging pump. Thus, this event is not safety significant, and the health and safety of the public were not affected. In addition, since the 3A EDG was available (although inoperable), the risk significance of the plant alignment was negligible.

CORRECTIVE ACTIONS

1. Procedures 0-OSP-023.3 and 3-OSP-201.1 will be revised to reflect verbatim compliance with TS 3.1.2.1.
2. Operations will provide training on this event to inform all operators of the correct interpretation of TS 3.1.2.1.
3. Personnel involved in the misinterpretation of TS 3.1.2.1 have been counseled.
4. The TS Bases will be revised to reflect this interpretation of TS 3.1.2.1.

ADDITIONAL INFORMATION

EIIS Codes are shown in the format [EIIS SYSTEM: IEEE component function identifier, second component function identifier (if appropriate)]. Similar events at Turkey Point Units 3 and 4 include LER 250/97-003 and LER 251/2000-002. Although both LERs involved inadequate procedures, and 250/97-003 also involved a knowledge deficiency, neither LER involved a misinterpretation of a TS requirement. Therefore, corrective actions from the previous LERs would not be expected to have precluded this event.