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10 CFR § 50.73
L-2010-170
AUG 5 2010

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555-0001

Re: Turkey Point Unit 3
Docket No. 50-250
Reportable Event: 2010-002-00
Date of Event: June 7, 2010
Fuel Transfer Pump Failure Renders 3B Emergency Diesel Generator Inoperable

The attached Licensee Event Report 05000250/2010-002-00 is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) to provide notification of the subject event.

If there are any questions, please call Mr. Robert Tomonto at 305-246-7327.

Very truly yours,

PAUL U. RUBIN FOR:

Michael Kiley
Vice President
Turkey Point Nuclear Plant

Attachment

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

IE22
NRR

NRC FORM 366 (9-2007) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2010

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.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Turkey Point Unit 3	05000250	1 of 6

4. TITLE

Fuel Transfer Pump Failure Renders 3B Emergency Diesel Generator Inoperable

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
6	7	2010	2010	- 002 -	00	8	5	2010	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE: 1

10. POWER LEVEL: 100

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

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER (Include Area Code)
Paul F. Czaya	305-246-7150

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 15. EXPECTED SUBMISSION DATE)*	☒ NO				

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

During testing of the 3B Emergency Diesel Generator (EDG) on June 7, 2010, the 3B Fuel Transfer Pump (FTP) failed to start with a low level in the 3B fuel oil day tank. The test was terminated and the 3B EDG was shut down. The cause of the failure was due to binding of the FTP. The apparent cause of binding was lack of bearing lubrication. There was no preventive maintenance (PM) activity in place to ensure adequate bearing lubrication. Corrective actions include: 1) The 3B EDG FTP was replaced, 2) the 3A EDG FTP bearings were lubricated and the pump was run to verify functionality, 3) the 3A EDG FTP will be replaced, and 4) a PM activity will be developed to lubricate the Unit 3 EDG FTP bearings. A past operability assessment concluded that the 3B FTP and thus the 3B EDG were inoperable in accordance with the Technical Specifications (TS) for a period of about 1.5 months, which exceeds the allowed outage time of 14 days. This is a condition prohibited by the TS and reportable. The 3B EDG fuel oil day tank is equipped with a low level alarm that annunciates in the control room. The fuel available in the day tank at the low level alarm setpoint is sufficient for the 3B EDG to operate at design basis loads for at least 18 hours. Operators are directed to transfer fuel with an alternate transfer pump in accordance with an existing procedure in the event of failure of the 3B FTP. Thus, operators are notified and have sufficient time to take manual action to ensure the 3B EDG can perform its safety function. Therefore, while the 3B EDG was not operable in accordance with TS during the period of concern, it was functional, and thus this event has low safety significance.

NARRATIVE

DESCRIPTION OF THE EVENT

During testing of the 3B Emergency Diesel Generator (EDG) [EK, DG] on June 7, 2010, the 3B Fuel Transfer Pump (FTP) [DE, P] failed to start when placed in Auto with a low level in the 3B fuel oil day tank [DE, TK]. The pump switch [DE, HS] was placed in Hand and still failed to start. Operators investigated the breaker [ED, BKR] and reset the thermal trips [DE, RLY, 49]. It was reported that the pump started to rotate for less than 1 second and the thermal protection tripped again. The test was terminated and the 3B EDG was shut down.

A past operability assessment concluded that the 3B EDG and its FTP were inoperable for about one half of the time since the last successful operation of the FTP on 3/17/2010. This approximately 1.5 month period exceeds the allowed outage time for one inoperable EDG of 14 days and so is a condition prohibited by the Technical Specifications (TS). Condition Report 406564 was initiated in response to the event.

This event is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B).

CAUSE OF THE EVENT

The cause of the failure of the 3B EDG FTP to start automatically at the low-level setpoint of the 3B EDG fuel oil day tank was due to binding of the FTP. The apparent cause of binding was lack of bearing lubrication. There was no preventive maintenance (PM) activity in place to ensure adequate bearing lubrication.

ANALYSIS OF THE EVENT

Background

Each Turkey Point unit has two associated EDGs. TS Limiting Condition for Operation (LCO) 3.8.1.1.b requires a unit's two EDGs and one of the opposite unit's EDGs to be operable to provide standby electrical power for required equipment in support of plant operation in Modes 1-4. TS LCO 3.8.1.1.b.1)c) requires each Unit 3 EDG to have its own separate FTP. The safety related function of the EDGs is to automatically start and provide power to required safety related loads during a loss of offsite power in order to achieve and maintain safe shutdown of the reactor [AC, RCT].

The fuel oil storage and transfer system [DE] associated with EDGs 3A and 3B stores fuel oil in an onsite fuel oil storage tank, transfers the fuel oil to either one of the two fuel oil day tanks (one tank is associated with each EDG), and transfers the fuel oil from each EDG's fuel oil day tank to its associated skid mounted tank.

NARRATIVE

The fuel oil storage tank has a capacity of 64,000 gallons, which provides sufficient storage capacity to permit one EDG (3A or 3B) to operate at its 168 hour rating for at least 7 days. Two FTPs are provided to transfer fuel oil from the fuel oil storage tank to the fuel oil day tanks. Either of these pumps can be manually aligned to provide fuel oil flow to either or both of the fuel oil day tanks associated with EDGs 3A and 3B. In addition, the discharge lines from these pumps and the pumps associated with EDGs 4A and 4B are interconnected to provide additional fuel oil supply alignment flexibility. Each Unit 3 EDG has a 4000 gallon fuel oil day tank. Each fuel oil day tank has an alternate fill connection which is suitable for a tie-in from a mobile tank unit. These fill lines provide an alternate fill path for the fuel oil day tanks should the normal supply via the FTPs become unavailable.

Analysis

Troubleshooting revealed that both the inboard (IB) and outboard (OB) bearings on the 3B FTP were open-faced on one side and sealed on the other. Based on the orientation of the bearings within the pump housing, the open-faced side – the side with grease fittings – indicates that the IB and OB bearings are designed to be greased. The IB radial bearing was found to spin freely; however, it was partially filled with emulsified grease which had some free standing water within it. The OB thrust bearing was full of rust and, when turned, showed signs of damage. The OB thrust bearing was also partially filled with heat damaged grease and had free standing water within the housing. The inspection concluded that the IB and OB bearings showed signs of inadequate lubrication. Because the OB thrust bearing was designed to take higher pump loads than the IB radial bearing, it degraded faster and was the source of the high torsional loading at pump startup. The 3B FTP was replaced.

There is no evidence that both the 3A and 3B EDG FTPs were ever greased following initial lubrication after installation in 2004. Both pumps are exposed to the same outside environmental conditions. The 3A pump was run on June 11, 2010 satisfactorily. As with the 3B pump, there is no PM to grease the 3A pump bearings. The 3A pump bearings were greased on June 11, 2010. The 3A FTP is currently scheduled to be replaced in December 2010.

The U4 EDG FTPs are of a different model and have sealed bearing faces. As such, they are not required to be greased. Furthermore, the pumps are within the U4 EDG building in their respective FTP rooms and are not open to the same environmental conditions as the U3 EDG FTPs. Therefore, this condition only pertains to the U3 EDG FTPs.

Past Operability Assessment

A prior failure of the 3B FTP occurred on March 16, 2010. Degradation of the pump was not considered a cause, though Maintenance personnel noted difficulty in hand-turning the pump shaft during troubleshooting. After the thermal overload relay (which was considered the most apparent cause) was replaced, the pump operated satisfactorily. The failure of the 3B FTP on June 7, 2010 is a repeat event resulting from the same cause.

NARRATIVE

There is no evidence that the 3B EDG FTP was operated between March 17, 2010 and June 7, 2010. The 3B EDG FTP was run successfully on September 30, 2009, November 21, 2009 and December 23, 2009 to fill the 3B fuel oil day tank. A T/2 determination approximates that, for a total of about 1.5 months, the 3B FTP was operable since its last successful run on March 17, 2010. The T/2 determination is justified by the fact that, previously, the pump was idle for 2 months and 1 month and ran successfully afterwards on November 21, 2009 and December 23, 2009, respectively. This is indicative that for about 1.5 months the pump can be considered operable following a successful run. However, there is no reasonable assurance that the FTP and, thus, the 3B EDG was operable in accordance with the TS from about May 1, 2010 until June 9, 2010 when the pump was replaced and returned to service. The lack of grease in the bearing has existed for several years and the degraded condition of the bearing after March 17, 2010 is expected to be substantially the same as the September 30, 2009 to December 23, 2009 time frame.

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.

TS LCO 3.8.1.1.b.1)c) and 3.8.1.1.b.2)c) require a separate FTP to support operability of its related EDG. TS Surveillance Requirement (SR) 4.8.1.1.2.b requires "Demonstrating at least once per 92 days that a fuel transfer pump starts automatically and transfers fuel from the storage system to the day tank." TS SR 4.8.1.1.2.b can only be satisfied by acceptable performance of the FTP associated with a particular EDG.

As discussed above in the Past Operability Assessment, the 3B EDG is considered inoperable from about May 1, 2010 to June 9, 2010 due to lack of reasonable assurance of FTP operability between the tests conducted on March 17, 2010 and June 7, 2010. The condition placed Unit 3 in TS 3.8.1.1, Actions b and d for the 3B EDG.

TS 3.8.1.1, Action b requires startup transformer [EB, XFMR] and associated circuit operability to be verified within one hour. This action was not met because Operations personnel were not aware that the 3B EDG was inoperable on May 1, 2010.

TS 3.8.1.1, Action b requires restoration of "...the inoperable diesel generator to OPERABLE status within 14 days** or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours." This action was not met because Operations personnel were not aware that the 3B EDG was inoperable from May 1, 2010 to June 9, 2010.

TS 3.8.1.1, Action d.1 requires a cross-train operability verification for required equipment powered by the remaining required operable EDGs to be completed within two hours. This action was not satisfied for the 3B EDG.

NARRATIVE

TS 3.8.1.1, Action d.2 requires at least two high head safety injection (HHSI) pumps [BQ, P] to be verified operable and capable of being powered from their associated operable EDGs within 2 hours. This action was not satisfied for the 3B EDG.

10 CFR 50.73(a)(2)(i)(B) requires the reporting of :
"Any operation or condition which was prohibited by the plant's Technical Specifications except when:

(1) The Technical Specification is administrative in nature;
(2) The event consisted solely of a case of a late surveillance test where the oversight was corrected, the test was performed, and the equipment was found to be capable of performing its specified safety functions; or
(3) The Technical Specification was revised prior to discovery of the event such that the operation or condition was no longer prohibited at the time of discovery of the event."

The following conditions are reportable in accordance with 10 CFR 50.73(a)(2)(i)(B):

1. Non-compliance with TS 3.8.1.1, Action b requiring startup transformer and associated circuit operability to be verified within one hour of inoperability of the 3B EDG.
2. Non-compliance with TS 3.8.1.1, Action b requiring the 3B EDG to be restored to operable status within 14 days.
3. Non-compliance with TS 3.8.1.1, Action d.1 requiring cross-train operability verification for required equipment powered by the remaining required operable EDGs completed within two hours of the inoperability of the 3B EDG.
4. Non-compliance with TS 3.8.1.1, Action d.2 requiring at least two HHSI pumps to be verified operable and capable of being powered from their associated operable EDGs within 2 hours of inoperability of the 3B EDG.

As none of the three exceptions to 10 CFR 50.73(a)(2)(i)(B) apply in this case, the conditions are reportable.

ANALYSIS OF SAFETY SIGNIFICANCE

The 3B EDG fuel oil day tank is equipped with a low level alarm at 4 feet 11 inches which equals a total available volume of 3,150 gallons not including the skid tank. The FTP start setpoint is 5 feet 2 inches. The low level alarm annunciates in the control room. The fuel available in the day tank at the low level alarm setpoint is sufficient for the 3B EDG to operate at design basis loads for at least 18 hours. The 3B fuel oil day tank level was above 5 feet 2 inches during the period between May 1, 2010 and June 9, 2010. In addition, operators are directed in the Emergency Operating Procedures to transfer fuel with an alternate transfer pump in accordance with an existing procedure in the event of failure of the 3B FTP. Thus, operators are notified and have sufficient time to take manual action to ensure the 3B EDG can perform its safety function. Therefore, while the 3B EDG was not operable in accordance with TS during the period of concern, it was functional, and thus this event has low safety significance.

NARRATIVE

CORRECTIVE ACTION

Corrective actions include:

1. The 3B EDG FTP was replaced.
2. The 3A EDG FTP bearings were lubricated and the pump was run to verify functionality.
3. The 3A EDG FTP will be replaced.
4. A PM activity will be developed to lubricate the Unit 3 EDG FTP bearings.

ADDITIONAL INFORMATION

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

FAILED COMPONENTS IDENTIFIED: None (not an intrinsic failure)

PREVIOUS SIMILAR EVENTS: See past operability assessment above.