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FEB 1 0 2005

10 CFR § 50.73
L-2005-026

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

Re: Turkey Point Unit 3
Docket No. 50-250
Reportable Event: 2004-006-00
Date of Event: December 14, 2004
Manual Reactor Trip Due to Fire in the High Pressure Turbine Area

The attached Licensee Event Report 250/2004-006-00 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,

MR Rence FOR

Terry O. Jones
Vice President
Turkey Point Nuclear Plant

Attachment

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

IE22

NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 06/30/2007

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 5

4. TITLE
Manual Reactor Trip Due to Fire in the High Pressure Turbine Area

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
12	14	2004	2004	- 006 -	00	02	10	2005	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)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☐ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☒ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER (Include Area Code)
Olga Hanek – Licensing Engineer	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

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

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

On December 14, 2004, at 11:40 with Units 3 and 4 operating in Mode 1 at 100 percent power, a fire was reported at the North end of the Unit 3 High Pressure Turbine, beneath the turbine deck. At 11:45 Unit 3 was manually tripped due to the fire in the High Pressure Turbine area. The fire brigade responded and the fire was extinguished at 11:49. No damage to equipment or personal injury occurred and no Engineering Safety Feature Actuation was required as a result of the manual reactor trip. The fire was caused by the ignition of oil vapors generated by oil leaking from the number 2 bearing seal onto the High Pressure Turbine lower shell insulation. The cause of the seal oil leak was a result of poor workmanship performed during the spring 2003 refueling outage turbine seal overhaul. Specifically, the leaking oil was caused by improper bolting of the seal, inadequate gasket, inadequate sealing compound and shims introduced during the seal overhaul performed during the spring 2003 Unit 3 refueling outage. The Unit 3 turbine shaft seals were rebuilt, oil soaked insulation was removed, metal lagging added where necessary, and insulation replaced.

The turbine fire did not affect any of the Unit 3 safety systems. All safety systems responded as designed; therefore, the health and safety of the public were not affected by the turbine fire and manual reactor trip.

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

DESCRIPTION OF THE EVENT

On December 14, 2004, at 11:40 with Units 3 and 4 operating in Mode 1 at 100 percent power, a Class B fire was reported at the North end of the Unit 3 High Pressure Turbine [TRB], in the area of the number 2 bearing, beneath the turbine deck. At 11:45 Unit 3 was manually tripped due to the fire in the High Pressure Turbine area. The fire brigade responded to the fire and the fire was extinguished at 11:49. No offsite support was requested or required. This event did not meet the Turkey Point Plant Radiological Emergency Plan Emergency Action Level criteria for declaration of an Unusual Event due to an uncontrolled fire within the power block lasting longer than 10 minutes.

In accordance with 10CFR 50.72(b)(2)(iv)(B), a four-hour Emergency Notification System report was made to the NRC Operations Center on December 14, 2004, at 12:45 (Event Number 41257) for the manual reactor trip.

ANALYSIS OF THE EVENT

No damage to equipment or personal injury occurred and no Engineering Safety Features (ESF) actuation was required as a result of the manual reactor trip. All safety systems responded as designed.
The Reactor Coolant System (RCS)) [AB] pressure remained above the safety injection actuation setpoint and the RCS pressure remained below the setpoint for pressurizer PORV or Code safety valve actuation.
The Auxiliary Feedwater System actuated due to steam generator low levels as expected.

CAUSE OF THE EVENT

The cause of the Unit 3 manual reactor trip was operator response to a fire at the North end of the Unit 3 High Pressure Turbine, beneath the turbine deck. The cause of the Unit 3 High Pressure Turbine fire was an oil leak from the number 2 bearing seal assembly, which caused the insulation on the High Pressure Turbine lower housing to become saturated with oil. The high temperature of the High Pressure Turbine casing in the vicinity of the saturated insulation caused the oil to begin evaporating. These oil vapors began mixing with the air in the area, causing the flash point of the oil to drop substantially, from about 425 degrees F to about 270 degrees F. At this lower flash point, the surfaces of the nearby equipment, including the High Pressure Turbine casing and the gland steam piping, were sufficiently hot to cause the mixture to ignite. The cause of the seal oil leak was a result of poor workmanship performed during the spring 2003 refueling outage turbine seal overhaul.

Background Information

The oil seal rings are fabricated in halves and are secured to the bearing support housing by socket head cap screws or bolts. The upper and lower seal ring halves are joined at the horizontal joint by socket head screws. The rings contain seal strips inserted into grooves in the seal halves. Oil that is adhering to the shaft and which is not thrown from the turbine rotor by centrifugal force is captured by the seal rings. The captured oil flows downward through a series of clearances between the ring and the shaft. The seal ring is installed with a 0.005 inch clearance at the bottom, which results in a 0.035 inch top clearance while the

shaft is at rest. This clearance provides an allowance for the expected upward movement of the shaft (up to 0.020 inch).

Inspection upon disassembly revealed several oil leakage paths through the seal. Deficiencies that contributed to the oil leakage path were:

1. Top Half of Oil Seal Ring Vertical Face

   Failure to install a gasket in the sealing surface between the vertical face of the top half of the seal ring and the bearing cover. The top half of the seal ring was removed during the spring 2003 refueling outage to facilitate the Low Pressure turbine overhaul.

   Use of inappropriate gasket sealing compound caused the sealant to run down into the bottom half of the seal, clogging the drain holes.

2. Horizontal Joint Between the Top and Bottom Halves of the Seal

   Two shims were installed on the horizontal joints of the seal during the spring 2003 refueling outage. The shims were installed to establish the proper clearance at the top of the seal. The shims were fabricated to cover part of the seal face instead of the full seal face. This created a leak path along the face of the seal not covered by the shim.

   A gasket was installed in the bottom half of the seal, creating a 1/16 inch gap between the edges of the two horizontal faces.

3. Oil Seal Ring Excessive Clearance

   The oil seal ring had excessive clearances (0.049 inch) at the sides of the ring halves, creating a flowpath for oil along the turbine shaft.

4. Missing and Loose Bolting

   The lower half of the seal assembly was improperly installed. Three bolts on the lower half of the seal were found loose and one bolt was missing.

Extent of Condition

Visual inspections were performed on the Unit 3 and Unit 4 turbine to determine the extent of condition. An oil leak on the Unit 3 number 1 bearing was identified. No issues were identified in the Unit 4 turbine.

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). This event is reportable in accordance with 10 CFR 50.73(a)(2)(iv)(B)(1), actuation of the Reactor Protection System (RPS), since Unit 3 was manually tripped in response to the turbine fire.

In addition, in accordance with 10CFR 50.72(b)(2)(iv)(B), a four-hour Emergency Notification System report was made to the NRC Operations Center on December 14, 2004, at 12:45 (Event Number 41257) for the manual reactor trip.

ANALYSIS OF SAFETY SIGNIFICANCE

This event had no significant effect on the health and safety of the public. The turbine fire did not impact any safety related systems. A manual reactor trip was initiated in response to the turbine fire. As discussed in the Analysis of Event Section, all safety systems operated as designed; therefore, there were no actual safety consequences for the event.

CORRECTIVE ACTIONS

Short Term

1. The Unit 3 turbine number 1 and 2 seals were rebuilt.
2. Other identified leak points on the main turbine were corrected.
3. The oil soaked insulation was removed and replaced.
4. Metal lagging was added to areas that could be affected by leaking oil.
5. An oil leak inspection of the turbine oil system was performed prior to restart of Unit 3.
6. The Unit 4 turbine was inspected for possible oil leaks.

Long Term

1. Turkey Point will investigate the use of insulation that does not absorb oil.
2. Turkey Point will inspect other equipment in Units 3 and 4 that could have oil soaked insulation and high surface temperatures.
3. Turkey Point will revise Turbine Overhaul procedures and work instructions to provide more detailed requirements for a) gasket installation, b) bolting installation and torquing requirements, c) shim installation and clearance acceptance criteria, and d) to identify critical steps and require additional oversight for these critical steps.

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

ADDITIONAL INFORMATION

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

FAILED COMPONENTS IDENTIFIED: NONE

SIMILAR EVENTS

A review of previous Licensee Event Reports in the past three years did not indicate any similar reportable events at Turkey Point.