



10 CFR 50.73
L-2021-084
April 29, 2021

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: 2021-001-00
Date of Event: March 1, 2021
Title: Automatic Reactor Trip due to Reactor Trip Breaker Cell Switch Malfunction

The attached Licensee Event Report 05000250/2021-001-00 is submitted pursuant to 10 CFR 50.73 (a)(2)(iv)(A), due to automatic actuation of the Unit 3 Reactor Protection System and Auxiliary Feedwater System.

If there are any questions, please call Mr. Robert Hess at 305-246-4112 or e-mail Robert.Hess@fpl.com.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Bob M. Pearce for M. Pearce'.

Michael Pearce
Site Vice President – Turkey Point Nuclear Plant
Florida Power & Light Company

Attachments: USNRC Forms 366 and 366A, current revision

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



LICENSEE EVENT REPORT (LER)

(See Page 3 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form
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Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollections.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk all: oir_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. Facility Name Turkey Point Unit 3	2. Docket Number 05000	3. Page 250 1 OF 3
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4. Title Automatic Reactor Trip due to Reactor Trip Breaker Cell Switch Malfunction

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	Docket Number
03	01	2021	2021	- 001 -	00	04	29	21		05000
									Facility Name	Docket Number
										05000

9. Operating Mode 1	10. Power Level 100
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11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)				
10 CFR Part 20	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.36(c)(2)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	10 CFR Part 73
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.69(g)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(4)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.71(a)(5)
<input type="checkbox"/> 20.2203(a)(2)(i)	10 CFR Part 21	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(1)(i)
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 21.2(c)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(i)
<input type="checkbox"/> 20.2203(a)(2)(iii)	10 CFR Part 50	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 73.77(a)(2)(ii)
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<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)(v)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	
<input type="checkbox"/> OTHER (Specify here, in abstract, or NRC 366A).				

12. Licensee Contact for this LER	
Licensee Contact David Stoia - Licensing Engineer	Phone Number (Include area code) (305) 246-6538

13. Complete One Line for each Component Failure Described in this Report									
Cause	System	Component	Manufacturer	Reportable to IRIS	Cause	System	Component	Manufacturer	Reportable to IRIS
B	AA	BKR	W120	Y					

14. Supplemental Report Expected		15. Expected Submission Date		
<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date)	Month	Day	Year

16. Abstract (Limit to 1560 spaces, i.e., approximately 15 single-spaced typewritten lines)
On 3/1/21 at 11:08 hours, Turkey Point Unit 3 experienced an unplanned reactor trip from 100% power. Restoration from a routine test of the Reactor Protection System (RPS) was in progress when the reactor trip occurred. As expected for the conditions, the Auxiliary Feedwater System (AFW) automatically initiated in response to the reactor trip to maintain Steam Generator levels in normal bands. All equipment required for the immediate reactor trip response functioned normally.
A malfunction of the B-train Reactor Trip Breaker cubicle cell switch during the RPS test restoration caused the reactor trip. The breaker and cell switch have since been replaced and Unit 3 returned to normal power operation.
This event is reportable pursuant to 10 CFR 50.73(a)(2)(iv)(A) for initiation of the Reactor Protection [10 CFR 50.73(a)(2)(iv)(B)(1)] and Auxiliary Feedwater [10 CFR 50.73(a)(2)(iv)(B)(6)] systems.

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

(See NUREG-1022, R.3 for instruction and guidance for completing this form
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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Turkey Point Unit 3	05000-250	2021	001	00

NARRATIVE**EVENT DESCRIPTION**

On 3/1/21 at 11:08 hours, Turkey Point Unit 3 experienced an unplanned reactor trip from 100% power. Restoration from a regularly scheduled test of the RPS was in progress when the reactor trip occurred. In response to the reactor trip, the AFW system [BA] automatically initiated to maintain Steam Generator [SG] levels stable within normal post-trip bands, which is expected following a reactor trip from a higher power level.

Restoration steps in the 3B Reactor Protection System Logic Test (procedure 3-SMI-049.02B), were being followed at the time of the reactor trip. The test is scheduled every quarter to meet the Technical Specification Surveillance Requirements of TS 4.3.1, Table 4.3-1, Functional Unit 20. The surveillance procedure aligns the RPS in a train-specific test configuration that utilizes the A-Train or B-Train Reactor Trip Bypass Breaker (BYA or BYB) [AA, BKR] and checks that the normal Reactor Trip Breaker (RTA or RTB) [AA, BKR] actuates in response to several trip logic inputs. During restoration of the B-Train test, with the RTB closed, the reactor trip occurred when the BYB was tripped open for restoration.

All equipment required for the immediate reactor trip response functioned properly. However, CV-3-2830, 3D Steam Dump to Condenser (SDTC) [SB, V], was slow to respond after the valve was demanded closed. This increased the Reactor Coolant System (RCS) cooldown rate, lowering Pressurizer level and automatically isolating RCS letdown. The Reactor Operator took manual control of the Pressurizer level function and restored letdown as directed by procedure. SDTC position and Pressurizer level are not referenced during Immediate Operator Actions (IOAs) and did not complicate the response to the reactor trip.

Corrective actions were taken to resolve the deficiencies associated with the RTB and CV-3-2830 prior to returning Unit 3 to service.

CAUSE

Reactor Trip and Bypass breaker cubicle cell switches provide logic inputs to the turbine trip primary and backup relays. The SOE report revealed that the reactor trip signal was initiated by turbine trip logic. The most likely cause identified by the Engineering team was that following the RPS surveillance, with the RTB racked in, a RTB cell switch was incorrectly providing racked-out position logic input to the backup turbine trip relay. When the BYB was tripped open during restoration, the logic to actuate the backup turbine trip relay was completed, tripping the turbine and initiating Train-A and Train-B reactor trip signals.

The Westinghouse DB-50 Reactor Trip and Bypass breakers utilize cell switch contacts located inside the breaker cubicles that provide open position logic to the turbine trip relays if the breaker is racked out. Failure analysis performed jointly between FPL Engineering and Westinghouse revealed that the most likely cause of the incorrect RTB position logic was failure of the cell switch contact. Graphite grease used for lubrication was found accumulated and hardened, creating an electrical tracking path for the incorrect logic signal. A review of the FPL preventive maintenance procedure showed that steps to clean and reapply grease on the switch contacts is condition-based rather than prescriptive.

The sluggish performance of CV-3-2830 was caused by an instrument air leak from its modulating solenoid, SV-3-1440 [SB, SSV].

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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
Turkey Point Unit 3	05000-250	YEAR 2021	SEQUENTIAL NUMBER 001	REV NO. 00

NARRATIVE**SAFETY SIGNIFICANCE**

The safety significance of this event is low. All equipment required for immediate response to the automatic reactor trip functioned as designed. One SDTC valve was slow to close, causing automatic isolation letdown and prompting the Reactor Operator to take manual control of pressurizer level. This equipment condition did not complicate the response or lessen the margin of safety that was maintained throughout the event.

CORRECTIVE ACTIONS

- The Unit 3 RTB was replaced.
- The Unit 3 RTB cell switches were replaced.
- The Unit 3 RTA, BYA, and BYB breaker cubicles and cell switches were inspected, cleaned, and tested for proper operation.
- A modification to detect for a standing trip signal from cell switch contacts was installed on Unit 3 RTA, RTB, BYA, and BYB.
- Work orders for Unit 4 RTA, RTB, BYA, and BYB cell switch inspection will be originated and scheduled for next Unit 4 outage.
- A modification to detect for a standing trip signal from cell switch contacts for Unit 4 RTA, RTB, BYA, and BYB will be developed and scheduled for implementation during the next Unit 4 refueling outage.
- A revision will be submitted to procedure 0-PME-049.01, Reactor Trip and Bypass Breaker Inspection and Maintenance, to require cleaning and lubrication of cell switch contacts.
- SV-3-1440, modulating solenoid for CV-3-2830, was replaced.
- AR 2385529 will prescribe additional actions to address the contributing causes and condition extent.

ADDITIONAL INFORMATION

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

SIMILAR EVENTS

A review of reactor trip events over the previous 5 years was performed to identify similar events or patterns. No reactor trips have occurred due to a malfunction of a RTB. No history of cell switch failure was identified.