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ACCESSION NBR: 9406070088 DOC. DATE: 94/05/31 NOTARIZED: NO DOCKET #
 FACIL: 50-250 Turkey Point Plant, Unit 3, Florida Power and Light Co 05000250
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 PLUNKETT, T.F. Florida Power & Light Co.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 94-002-00: on 940505, spurious actuation of 3A safety injection signal occurred. Caused by intermittent seal-in contact failure of block relay. SIB-1 relay was replaced & system tested to demonstrate operability. W/940531 ltr.

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MAY 3 1 1994

L-94-131
10 CFR 50.73

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

Gentlemen:

Re: Turkey Point Unit 3
Docket No. 50-250
Reportable Event: 94-002-00
Inadvertent Engineered Safety Feature Actuation

The attached Licensee Event Report, 250/94-002-00, is being provided in accordance with 10 CFR 50.73(a)(2)(iv).

If there are any questions, please contact us.

Very truly yours,

T. F. Plunkett
Vice President
Turkey Point Plant

TFP/JEK/jk

enclosure

cc: Stewart D. Ebnetter, Regional Administrator, Region II,
USNRC
Thomas P. Johnson, Senior Resident Inspector, USNRC, Turkey
Point Plant

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) <div style="text-align: center;">TURKEY POINT UNIT 3</div>	DOCKET NUMBER (2) <div style="text-align: center;">05000250</div>	PAGE (3) <div style="text-align: center;">1 OF 4</div>
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TITLE (4) Inadvertent Engineered Safety Feature Actuation

EVENT DATE (5)			LER NUMBER(6)			RPT DATE (7)			OTHER FACILITIES INV. (8)		
MON	DAY	YR	YR	SEQ #	R#	MON	DAY	YR	FACILITY NAMES		DOCKET # (S)
05	05	94	94	002	00	05	31	94	Turkey Point Unit 4		05000251
OPERATING MODE (9)		5		10 CFR 50.73(a)(2)(iv)							
POWER LEVEL (10)		0%									

LICENSEE CONTACT FOR THIS LER (12)

J. E. Knorr, Licensing Specialist	TELEPHONE NUMBER 305-246-6757
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	NPRDS?	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	NPRDS?
B	BQ	68	W120	Yes					

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

ABSTRACT (16)

On May 5, 1994, with Turkey Point Unit 3 in Mode 5, while restoring power to the safeguards racks, a spurious actuation of the 3A safety injection signal occurred. This spurious signal resulted in the actuation of the 3A channel of engineered safeguards. The Unit 3 A train signal initiated the 3A, 4A, and 4B sequencers which started all four Emergency Diesel Generators as well as other engineered safety features which were in service at the time. The actuation occurred when a safety injection block relay failed to maintain the block signal after power application to the relay racks. The cause was an intermittent seal-in contact failure of a block relay.

All equipment operated as designed except the 4A safety injection pump which did not start. This failure to start has been concluded to be an intermittent failure mechanism which could not be duplicated during troubleshooting.

To replace the suspect relay causing the failure of the 4A pump to start, the 4A sequencer had to be taken out of service for a short time. This short out-of-service time required the plant to comply with Technical Specification Table 3.3-2, Action 23. This action requires that the sequencer be returned to service within one hour or further action on Unit 4 be taken. The duration during which the 4A sequencer was out of service was 17 minutes.

This event is being reported in accordance with 10 CFR 50.73(a)(2)(iv).

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME	DOCKET NUMBER	LER NUMBER	PAGE NO.
TURKEY POINT UNIT 3	05000250	94-002-00	02 OF 04

I. DESCRIPTION OF THE EVENT

On May 5, 1994, with Unit 3 in Mode 5, while restoring power to the safeguards logic cabinets [JE:CAB] in preparation for an integrated safeguards surveillance test, a spurious actuation of the Turkey Point Unit 3, 3A safety injection signal occurred. This signal resulted in the actuation of the 3A channel of engineered safeguards. The signal initiated the 3A, 4A, and 4B sequencers, as designed. A partial phase "A" containment isolation also occurred, as expected. This process resulted in the start of the four Emergency Diesel Generators (EDG) [EK:DG]. All equipment, which was not out of service in accordance with procedures in effect at the time, started as designed except for the 4A safety injection pump [BQ:P].

This inadvertent Engineered Safety Feature (ESF) actuation is being reported in accordance with 10 CFR 50.73(a) (2) (iv).

II. CAUSE OF THE EVENT

ESF Actuation

A review of the wiring diagrams and operator observations of the relay response to the event sequence indicated several possible causes. Field verification of the possible causes revealed that the intermittent continuity of the seal-in contacts of the SIB-1 relay [BQ:68] which should block any safety injection signal, during the power application to the safeguards logic racks, did not make good contact and, therefore, an SI actuation signal occurred after the manual block relay actuation button was released. During the trouble shooting of the relay contacts, the SI block seal-in contact resistance was initially intermittent and then read open consistently. The contact is required to be closed for seal-in of the SI block to function. The SIB-1 relay and its contacts were removed for inspection. The contact surfaces were found to be coated with corrosion products. The contacts were sent to a Florida Power and Light Company (FPL) laboratory for further analysis. The analysis revealed a heavy layer of sulfur oxide. Normally these coatings are at a minimum due to the self cleaning process of arcing which occurs during opening and closing of the contacts. However, this contact is infrequently operated (only during plant cooldowns or refueling testing).

4A SI Pump Failure to Start

After the inadvertent ESF actuation signal, all inservice equipment operated as designed except the 4A safety injection pump which did not start as expected. This failure to start appears to be due to an intermittent failure mechanism which could not be duplicated during trouble shooting. A blocking [BQ:68] and timing relay [BQ:34] controlling the start of the 4A SI pump were replaced. Subsequent testing during the integrated safeguards testing process resulted in repeated successful starts of the 4A SI pump.

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III. ANALYSIS OF THE EVENT

Licensing Requirements

The licensing basis at Turkey Point assumes the initiation of a safety injection actuation if any one of a number of setpoints is reached. During the application of power to the safeguards logic racks, the block relay is required to be in the block position to prevent an SI signal from reaching the logics. Since the intermittent nature of the contact was present, an inadvertent signal was generated since the block was not in place while the various SI signals were present. In this case the first setpoint to reach the logic and cause the ESF actuation was "High Differential Pressure Between the Steam Line Header and any Steam Line" two out of three logic.

The removal of the 4A sequencer from service to replace the suspect relay which prevented the 4A safety injection pump from starting, is covered by Technical Specification Table 3.3-2, Engineered Safety Features Actuation System Instrumentation, Action 23. This action requires that the sequencer be returned to service within one hour or further action on Unit 4 be taken. During the relay replacement, the 4A sequencer was out of service for approximately 17 minutes.

Analysis of Effects on Safety

Unit 3 was in Mode 5 at the time of the SI signal generation and Unit 4 was in Mode 1. Only the 3A train of engineered safety features actuated. The 3A train actuation starts the 4A and 4B trains as well. The 3B train receives no start signal from the 3A actuation. As a result, all systems in service at the time operated as expected except for the 4A safety injection pump. Two of the three expected SI pumps started. The 3B SI pump was not expected to start with only a 3A SI signal and did not start. Two SI pumps are assumed in the Turkey Point safety analysis of record for safety injection pumps available. Given the above assessment, the health and safety of the plant personnel and general public were not compromised.

IV. CORRECTIVE ACTIONS

1. The SIB-1 relay was replaced and the system tested to demonstrate operability. Subsequent testing of the safeguards system during the remaining Unit 3 integrated safeguards testing proved multiple times that the anomaly experienced during the initial power application to the safeguards racks was found and corrected.
2. The suspect SIB-1 relay was removed and contacts inspected to determine root cause of the inadvertent ESF signal. The contacts were found corroded and covered with a layer of sulfur oxide by FPL laboratory personnel.

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3. All relay racks for Reactor Protection, Containment Isolation and Safety Injection will be inspected against existing surveillance procedures to identify relays which are infrequently operated and would be reasonable candidates for a refueling outage relay surveillance program. A set of inspection and testing acceptance criteria will be developed for use in any such program. This action is scheduled to be complete by August 22, 1994.
4. Specifically, for the SI block relays, procedures 3/4-ONOP-049 have been revised to keep the blocking relays manually actuated until after voltage is reverified on their coils. This will verify the seal-in feature of the SIB-1 relay.
5. The timing relay [BQ:34] controlling the start of the 4A SI pump was replaced and satisfactorily tested.

V. ADDITIONAL INFORMATION

The failed SIB-1 relay was manufactured by Westinghouse Electric Corp. It was a BFD66S Relay.

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

No conditions such as those discussed above have been the subject of an LER at Turkey Point in the past.

