



AUG 18 2000

L-2000-163
10 CFR § 50.73

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

Re: Turkey Point Units 3 & 4
Docket Nos. 50-250 & 50-251
Reportable Event: 2000-002-00
Date of Event: July 21, 2000
Entry into Technical Specification LCO 3.0.3 While Performing Load
Center Undervoltage Relay Surveillance

The attached Licensee Event Report 250/2000-002-00 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 contact us.

Very truly yours,


R. J. Hovey
Vice President
Turkey Point Plant

DRL

Attachment

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

IE22

LICENSEE EVENT REPORT (LER)

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

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If 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.

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| FACILITY NAME (1) Turkey Point Unit 3 | DOCKET NUMBER (2) 05000250 | PAGE (3) Page 1 of 6 |
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TITLE (4)
Entry into Technical Specification LCO 3.0.3 While Performing Load Center Undervoltage Relay Surveillance

| EVENT DATE (5) | | | LER NUMBER (6) | | | REPORT DATE (7) | | | OTHER FACILITIES INVOLVED (8) | |
|----------------|-----|------|----------------|-------------------|-----------------|-----------------|-----|------|-------------------------------|---------------|
| MONTH | DAY | YEAR | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | MONTH | DAY | YEAR | FACILITY NAME | DOCKET NUMBER |
| 07 | 21 | 2000 | 2000 | 002 | 00 | | | | Turkey Point Unit 4 | 05000251 |
| | | | | | | | | | FACILITY NAME | DOCKET NUMBER |

| | | | | | | | | | | |
|--------------------------------|--|-------------------|---|------------------|---|--|--|--|--|--|
| OPERATING MODE (9) 1 | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11) | | | | | | | | | |
| | 20.2201(b) | 20.2203(a)(2)(v) | x | 50.73(a)(2)(i) | 50.73(a)(2)(viii) | | | | | |
| POWER LEVEL (10) 100 | 20.2203(a)(1) | 20.2203(a)(3)(i) | | 50.73(a)(2)(ii) | 50.73(a)(2)(x) | | | | | |
| | 20.2203(a)(2)(i) | 20.2203(a)(3)(ii) | | 50.73(a)(2)(iii) | 73.71 | | | | | |
| | 20.2203(a)(2)(ii) | 20.2203(a)(4) | | 50.73(a)(2)(iv) | OTHER | | | | | |
| | 20.2203(a)(2)(iii) | 50.36(c)(1) | | 50.73(a)(2)(v) | Specify in Abstract below or in NRC Form 366A | | | | | |
| | 20.2203(a)(2)(iv) | 50.36(c)(2) | | 50.73(a)(2)(vii) | | | | | | |

| LICENSEE CONTACT FOR THIS LER (12) | |
|---|---|
| NAME David R. Lafleur, Licensing Engineer | TELEPHONE NUMBER (Include Area Code) (305) 246 - 7150 |

| COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13) | | | | | | | | | |
|--|--------|-----------|--------------|--------------------|-------|--------|-----------|--------------|--------------------|
| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO EPIX | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO EPIX |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |

| SUPPLEMENTAL REPORT EXPECTED (14) | | | | EXPECTED SUBMISSION DATE (15) | | |
|---|---|----|--|-------------------------------|-----|------|
| YES (If yes, complete EXPECTED SUBMISSION DATE). | X | NO | | MONTH | DAY | YEAR |

ABSTRACT

On 7/21/00, Florida Power and Light Company (FPL) discovered that Turkey Point's procedure for testing the undervoltage trip relays for 480 Volt Load Centers A, B, C, and D has been inadvertently placing the plant in Technical Specification (TS) 3.0.3. The load center undervoltage trip test circuitry blocks both undervoltage, or both degraded voltage, channel trip circuits on a single load center during testing. Entry into TS 3.0.3 is due to reducing the number of operable undervoltage or degraded voltage channels on a load center to two less than the total required by TS 3.3.2, for this Engineered Safety Features Actuation signal.

The cause of this event is a failure to recognize the impact of this design feature on the Technical Specifications since they were first proposed in 1982. Acceptable protection logic in the design of the load center degraded voltage testing scheme exists such that automatic safety function capability is maintained during the testing of the relays at any load center. The present TS requirements do not allow performance of the required surveillance. FPL is pursuing a license amendment to allow performance of the monthly surveillance without requiring entry into TS 3.0.3. FPL is also performing a review to ensure there are no other cases in which a surveillance inadvertently removes more channels than allowed by the technical specifications.

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

DESCRIPTION OF THE EVENT

On July 21, 2000, Florida Power & Light Company (FPL) discovered that Turkey Point's procedure for testing the A, B, C and D 480 Volt Load Center undervoltage trip relays [ED:27] has been inadvertently placing the plant in a condition prohibited by technical specifications, requiring entry into Technical Specification (TS) 3.0.3. This condition is due to the design of the load center undervoltage trip test circuitry, which momentarily blocks both undervoltage channel trip circuits on a single load center during testing.

During the performance of the required monthly surveillance, the test switch is placed in the test position several times, each time for no more than 90 seconds. During this time, when the switch is in the test position, both channels of the trip circuits being tested are blocked and thus rendered inoperable. TS Table 3.3-2, Engineered Safety Features Actuation System Instrumentation, Items 7.b and 7.c and the related Action Statement 18, do not address this condition when both channels of one load center are rendered inoperable. As a result, the power plant in is a condition prohibited by technical specifications for the time the test switch is out of the Normal position. This design exists on both units.

CAUSE OF THE EVENT

The cause of this event is inattention to detail, dating back to the origination of the degraded voltage technical specifications. The design of the load center degraded voltage trip circuitry is such that actuation of the test switch causes both degraded voltage trip channels to be blocked on a single load center. This is the original design of the trip test circuitry. FPL failed to recognize the impact of this design feature when the Limiting Conditions for Operation were first proposed in 1982.

In 1977, the NRC directed FPL to add degraded voltage protection, and to propose appropriate technical specifications (NRC letter dated 6/3/77). FPL provided proposed technical specifications in 1982. Using extant TS concepts, FPL proposed Minimum Operable Channels of 2, and Minimum Degree of Redundancy of 0. The Functional Unit was described as "480 V Load Centers (2 ... relays per load center)." In 1983, FPL modified the proposal to allow operation to continue with one operable channel, if the inoperable channel is tripped within 1 hour. The proposed technical specifications were approved in 1984. There is no evidence of correspondence discussing the relationship between the number of relays and the number of channels, at that time or in any other subsequent correspondence.

ANALYSIS OF THE EVENT

System Description

The undervoltage monitoring system on the 480 Volt safety related Load Centers is provided to ensure timely separation of the safety related buses from offsite power during (sustained) degraded voltage conditions. Two protection schemes are provided. One is provided for undervoltage conditions concurrent with a Safety Injection (SI) signal while the other is provided for degraded voltage conditions during normal operation (non-SI). Both schemes ensure that loads are not damaged by degraded voltage conditions.

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The relevant portion of the 480 Volt System consists of four Load Centers (LCs) [ED:bu] for each unit. The system is powered from the 4.16 kV Emergency Safety Feature (ESF) buses A and B through four step-down transformers [EA:xpt]. LCs A and C are supplied from 4.16 kV bus A [EA:bu]. LCs B and D are supplied from 4.16 kV bus B. A simplified diagram of the degraded voltage protection logic is provided on page 6 of this LER.

Non-Safety Injection (Non-SI) Situation

The non-SI scheme has four voltage sensing relays on each load center. Channel 1 utilizes one 327I and one 327T relay; channel 2 does the same. The relays are interconnected in a "one out of two taken twice" channel trip logic such that the logic trips (initiates bus stripping) if degraded voltage is detected by either channel 1 relay (327I or 327T) concurrently with either channel 2 relay (327I or 327T). The 327I relay protects the system from degraded voltage over a long duration while the 327T relay protects the system during a large voltage transient for a short duration.

Each 327I relay has a fixed voltage setpoint and a fixed time delay of approximately 60 seconds. (The voltage setpoint is slightly different for each load center based upon specific loads supplied and length of cable runs.) If voltage remains below setpoint for 60 seconds, the relays initiate bus stripping on that 4.16 kV bus.

The 327T relays are inverse time delay relays, and provide protection for more severely degraded voltage of short durations. Each 327T relay has a voltage setpoint range set below the 327I setpoint voltage. When voltage drops to this setpoint range, the time before relay drop-out will vary inversely with the severity of the voltage drop. At the higher end of the voltage range, the time delay is approximately 11 seconds and at the lower end the time could be as short as 3 seconds. If voltage drops into the setpoint range and does not recover before the time delay expires, the relays initiate bus stripping on that bus.

A five position test switch (with positions labeled 12, 11, Normal, 21 and 22) enables the operator to test either relay on either channel. Placing the test switch in any position other than Normal will block the trip signal from its associated load center.

Safety Injection Situation

The scheme for SI has two voltage sensing relays (327H's) on each load center. If both relays on the load center sense an undervoltage condition (along with an SI signal and the associated EDG's output breaker being open), they will initiate bus stripping on the associated 4.16 kV bus.

The 327H relays provide a faster response and protection if an SI signal is present during the sustained degraded voltage condition. Each 327H relay has a fixed voltage setpoint and will drop out instantaneously upon undervoltage. If an SI signal is present and the EDG breaker is open, a 10 second timer will start. If voltage does not recover before the 10 seconds expires, bus stripping will initiate.

A three position, spring return to Normal, test switch enables the operator to test either relay. Placing the test switch in any position other than Normal will bypass the trip circuit of both channels and block the trip signal from its associated load center.

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Analysis

On 7/21/00, at 0900 hours, a licensed operator was reviewing surveillance procedure 3-OSP-006.2, "480 Volt Switchgear - Undervoltage Test," and questioned, via the plant's corrective action program, the operability of the undervoltage relays during testing. Subsequent analysis by plant engineering indicated that the load center undervoltage relay testing design and the plant Technical Specifications as written would place the plant in TS 3.0.3 during the time that the test switch was in any position other than Normal. Placing either the five position test switch (for undervoltage relay testing-non SI) or the three position test switch (for undervoltage relay testing-SI) out of its normal position will block the trip signal from its associated load center. The Total Number of Channels for 480 Volt Load Centers 3A, 3B, 3C, 3D and 4A, 4B, 4C, 4D for degraded voltage (TS Limiting Condition for Operation Table 3.3-2, 7b or 7c) is 2 per load center. Action Statement 18 is entered when the number of channels is one less than the Total Number of Channels. Since two channels are bypassed this action statement would not apply, and entry into TS 3.0.3 would be required.

Analysis of Safety Significance

The undervoltage monitoring system on 480 Volt safety related load centers is provided so that degraded load center voltage concurrent with a safety injection signal would initiate transfer to onsite power. The 480 Volt safety related load centers undervoltage monitoring system also provides protection to prevent damage to associated 480 Volt motors if the offsite power source experiences sustained undervoltage.

Acceptable protection logic in the design of the load center degraded voltage testing scheme exists. The design of either test switch is such that it would block the trip signal from its associated load center during the duration of a test. During testing, should a degraded condition occur at the load center, the degraded voltage would be sensed on the other load center of the same power train, and the trip signal would initiate sequencer action. Therefore, automatic safety function capability is maintained during the testing of the relays at any load center.

CORRECTIVE ACTIONS

1. Turkey Point is pursuing a license amendment to allow performance of the monthly surveillance without causing the plant to be in a condition prohibited by technical specifications.
2. Turkey Point has requested a temporary exemption from the requirements of 10CFR50.73, for reporting further entries into TS 3.0.3 for the condition described in this event report, until the proposed license amendment is approved.
3. Turkey Point will review all of the line items in TS Table 3.3-2, to ensure that there are no other cases in which surveillances inadvertently block more channels than allowed by the technical specifications.

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ADDITIONAL INFORMATION

In 1987, during surveillance testing, the undervoltage protection circuit for the 4C 480 Volt load center would not meet its acceptance criteria (LER 251/87-013-00). Operations attempted to place the channel in the tripped mode but could not, due to the failure and the design of the system. This required Unit 4 to be placed in (then) TS 3.0.1 which required the unit to be in HOT STANDBY in 7 hours. The cause of the event was determined to be a failure of relay 327TX/4C2 in the undervoltage protection scheme for the 4C 480 Volt load center.

In 1988, during surveillance testing, the undervoltage protection circuit for the 4A 480 Volt load center would not pass its test (LER 251/88-004-00). Operations was unable to place the channel in the tripped condition, so Unit 4 was required to be placed in (then) TS 3.0.1 which required the unit to be in HOT STANDBY in 7 hours. The cause of the event was determined to be failure of relays 327TX/4A1 and 327TX/4A2 in the undervoltage protection scheme for the 4A 480 Volt load center.

In 1995, Turkey Point reported an inadvertent condition prohibited by technical specifications, also related to TS table 3.3-2, in which a surveillance procedure directed the tester to simultaneously depress two test push buttons, thereby disabling both trains of containment pressure protection (LER 250/95-005-00). The condition reported in the present event report was not discovered in 1995, since only one load center is tested at a time, and protection remains available from the other load center in the bus (train).

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

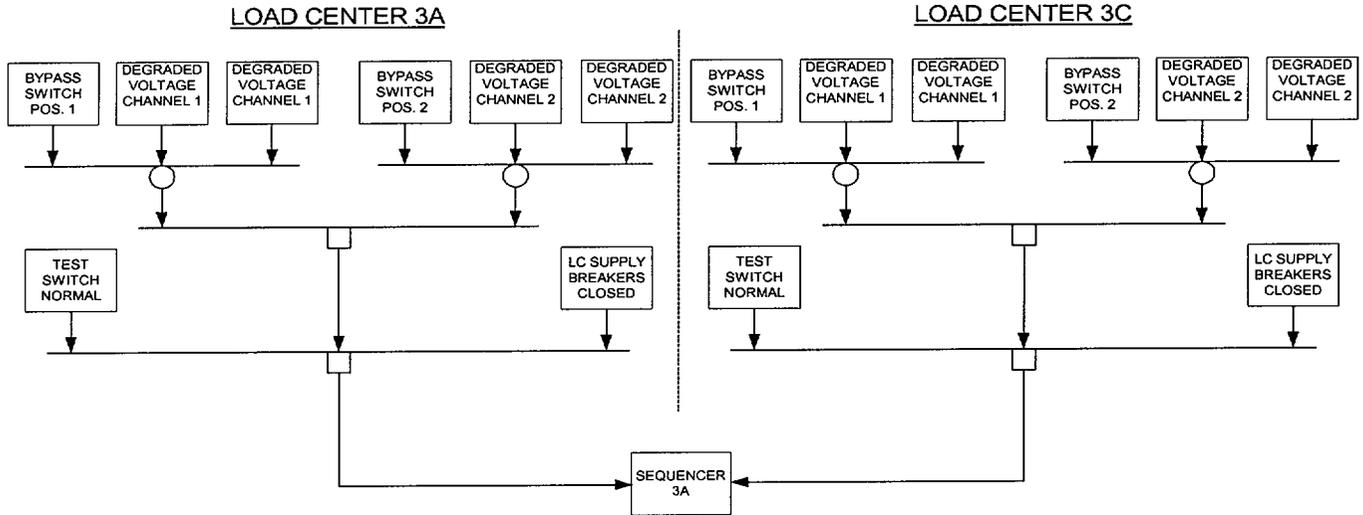
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SIMPLIFIED LOGIC DIAGRAMS

Degraded Voltage - Non-SI Situation



Degraded Voltage Protection; Coincident with SI

