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REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9201130155 DOC. DATE: 92/01/07 NOTARIZED: NO DOCKET #
 FACIL: 50-251 Turkey Point Plant, Unit 4, Florida Power and Light C 05000251
 AUTH. NAME AUTHOR AFFILIATION
 POWELL, D.R. Florida Power & Light Co.
 PLUNKETT, T.F. Florida Power & Light Co.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 91-007-00: on 911210, completion of TS required shutdown due to failure of 4A load sequencer. Caused by auto test output card. Unit shut down on 911210 & output contact card replaced. W/920107 ltr.

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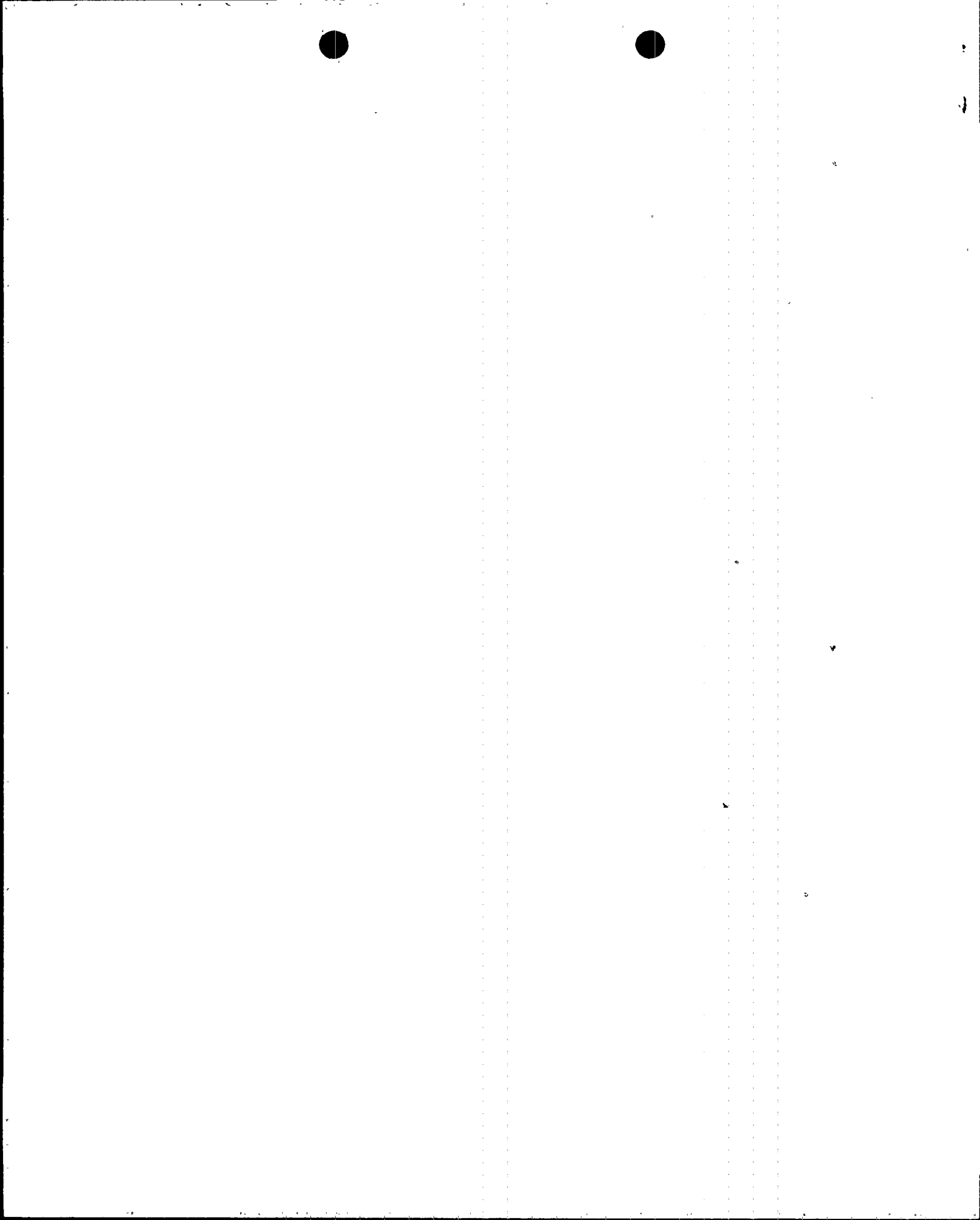
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| | NRR/DLPQ/LHFB10 | 1 1 | NRR/DLPQ/LPEB10 | 1 1 |
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| | NRR/DST/SELB 8D | 1 1 | NRR/DST/SICB8H3 | 1 1 |
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| | REG FILE 02 | 1 1 | RES/DSIR/EIB | 1 1 |
| | RGN2 FILE 01 | 1 1 | | |
| EXTERNAL: | EG&G BRYCE, J.H | 3 3 | L ST LOBBY WARD | 1 1 |
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JAN 07 1992

L-92-003
10 CFR 50.73

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

Gentlemen:

Re: Turkey Point Unit 4
Docket No. 50-251
Reportable Event: 91-007-00
Completion of Technical Specification Required Shutdown
Due to Failure of 4A Load Sequencer Auto Test Output Card

The attached Licensee Event Report 251-91-007-00 is being
provided in accordance with 10 CFR 50.73 (a) (2) (i) (A).

If there are any questions please contact us.

Very truly yours,

T. F. Plunkett
Vice President
Turkey Point Nuclear

TFP/JEK/jk

enclosures

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

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LICENSEE EVENT REPORT (LER)

| | | |
|---|--------------------------------------|---------------------------|
| FACILITY NAME (1) TURKEY POINT UNIT 4 | DOCKET NUMBER (2) 05000251 | PAGE (3) 1 OF 4 |
|---|--------------------------------------|---------------------------|

TITLE (4) **Completion of Technical Specification Required Shutdown Due to Failure of 4A Load Sequencer Auto Test Output Card.**

| EVENT | DATE (5) | LER NUMBER (6) | RPT DATE (7) | OTHER FACILITIES INV. (8) | | | | | | | |
|-------|----------|----------------|--------------|---------------------------|-------|----|----|-----|----|--|--------------|
| MON | DAY | YR | | YR | SEQ # | R# | MO | DAY | YR | | DOCKET # (S) |
| 12 | 10 | 91 | | 91 | 007 | 00 | 1 | 07 | 92 | | |

| | | |
|--------------------|-----|---|
| OPERATING MODE (9) | 1 | <u>10 CFR 50.73(a)(2)(i)(A)</u> (Specify in Abstract below and in text) |
| POWER LEVEL (10) | 100 | |

LICENSEE CONTACT FOR THIS LER (12)

| | |
|------------------------------------|------------------|
| David R. Powell, Licensing Manager | TELEPHONE NUMBER |
| | 305-246-6559 |

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | NPRDS | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | NPRDS |
|-------|--------|-----------|--------------|-------|-------|--------|-----------|--------------|-------|
| X | EK | 34 | A160 | Y | | | | | |

SUPPLEMENTAL REPORT EXPECTED (14)

| YES | X | S | (if yes, complete EXPECTED SUBMISSION DATE) | NO | EXPECTED SUBMISSION DATE (15) | MONTH | DAY | YEAR |
|-----|---|---|---|----|-------------------------------|-------|-----|------|
| | | | | | | 2 | 28 | 92 |

ABSTRACT (16)

On December 10, 1991, with Unit 4 at 100% power, during a routine system walkdown by the system engineer, the 4A sequencer was found in a condition where the automatic testing feature was not in service. Since the functionality of the sequencer could not be verified, the sequencer was declared inoperable at 1345 on that date. No Technical Specification specifically covers the load sequencer. However some safety related systems rely on the sequencer under various analyzed conditions of the plant. Technical Specifications that cover safety related systems that involve the sequencer have specific Action statements. The most conservative applicable Action statement required a reactor shut down to hot standby (Mode 3) within 6 hours. The plant was taken to Mode 3 at 1937 that same day.

After extensive troubleshooting that lasted several days, a failed sequencer auto test output card was discovered as the root cause. The card was replaced and the auto test feature was disabled to prevent reoccurrence of the initial root cause. A manual surveillance process was begun pending further component level investigation into the card failure.

This item is reportable in accordance with 10 CFR 50.73(a)(2)(i)(A).



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I. EVENT DESCRIPTION

On December 10, 1991, a routine system walkdown of the load sequencers was being conducted by the responsible system engineer. As part of the walkdown the engineer noticed that the 4A sequencer (EIIS-EK) (IEEE-34) was no longer in the auto test mode even though the auto test switch was in the auto test position. The system engineer unsuccessfully attempted to verify the status of the auto test function in the sequencer. Operations personnel were contacted for a restart of the auto test function and a manual test attempt. These attempts were also unsuccessful. No abnormal alarms, other than the auto test light out, were indicated on either the sequencer alarm modules or in the control room. Since normal operation of the sequencer could not be verified, the sequencer was declared inoperable at 1345 on December 10, 1991.

Technical Specification Table 3.3-2, "Engineered Safety Features Actuation System Instrumentation," defines minimum channels operable and Action statements if these minimums can not be met. The most restrictive of these Action statements invoked Technical Specification 3.0.3. This specification required the plant to be in hot standby within 6 hours, hot shutdown within the following 6 and cold shut down within the subsequent 24.

Turkey Point declared an Unusual Event in accordance with its Emergency Plan at 1737 due to the start of a Unit 4 shutdown required by Technical Specifications. Unit 4 reached hot standby (Mode 3) at 1937 on December 10, 1991 and hot shutdown (Mode 4) at 0142 on December 11, 1991.

Repair efforts identified and cleared an invalid indication of undervoltage on the 4C load center. During the troubleshooting effort, plant personnel found a faulty auto test output contact card on the 4A sequencer programmable logic controller (PLC) (IEEE-DCC). Following review and assessment of the corrected fault the sequencer was returned to service and declared operable at 2115 December 11, 1991.

The Unusual Event was terminated at 2115 December 11, 1991. Notifications of declaration and termination of the Unusual Event were made in accordance with the Turkey Point Emergency Plan Implementing Procedures.

Unit 4 returned to service on December 17, 1991.

II. EVENT CAUSE

a. Immediate Cause

The immediate cause of the Unit 4 shutdown was a condition found in the 4A sequencer which had an unknown effect on the operability of the sequencer. Technical Specification Table 3.3-2 action statement 23 required the shutdown of Unit 4 within 6 hours.



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b. Root Cause

The cause of the Unit 4 shutdown was the failure of a portion of the auto test output contact card on the 4A sequencer PLC. Detailed inspection of the contact card revealed a sticking contact on a small output relay. The sticking contact provided an input signal to the sequencer that appeared to the sequencer to be a valid input signal of undervoltage on the 4C load center. The sequencer does not allow either auto test or manual test to function if a valid input signal is present. This fault resulted in the auto test function being stopped while the sequencer waited for a safety injection signal. Without the safety injection signal the sequencer would not have actuated.

III. EVENT SAFETY ANALYSIS

The 4A sequencer receives an input from the load center 4C undervoltage relays in a two out of two logic configuration external to the sequencer. Receipt of this signal either from the output relays from this logic or from a test signal which lasts longer than .2 seconds from the test circuit will take the sequencer out of the auto test mode. An undervoltage signal in conjunction with safety injection and the emergency diesel generator breaker open initiates sequencer operation (i.e., bus stripping if this condition is present for longer than 10 seconds). Since the safety injection signal was not present, bus stripping and loading did not occur.

The sequencer design allows the performance of a continuous automatic test of all logic inputs and to abort the auto test in response to a valid input. The sequencer can not differentiate between an excessively long test signal and a valid field signal. The sequencer performed as designed when it terminated the auto test in response to what it sensed as a valid input signal. In this case the signal had not come from the field but from a failed high output module. Therefore the process logic for a valid undervoltage on the 4C load center was enabled.

Testing has been successful in recreating the intermittent failure of the test output module. Further an intermittent failure was left in place on an identical sequencer used for training. This training sequencer was then tested with a safety injection signal. The test was successful when the sequencer performed and completed its sequencing and loading function upon the receipt of the safety injection signal. Had a safety injection signal occurred with a false load center undervoltage signal present the 4A sequencer would have performed its design function for loss of offsite power and safety injection.



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If a safety injection signal had occurred without a loss of offsite power the sequencer would have actuated and stripped the 4A 4Kv bus from offsite power, started the emergency diesel generator and sequenced on each of the safeguards loads onto the 4A bus. The 4B 4Kv bus would have remained powered from offsite power. During the time of this event the redundant 4B 4Kv bus, the 4B sequencer and the 4B EDG and their associated equipment were operable and capable of performing their intended functions.

IV. CORRECTIVE ACTIONS

A. Immediate Corrective Actions

1. Unit 4 was shut down on December 10, 1991.
2. The faulty auto test output contact card on the 4A sequencer programmable logic controller (PLC) was replaced.
3. Verification of operation of the auto test circuit was required to be verified each 8 hours.

B. Corrective Actions to Prevent Recurrence

1. Turkey Point will administratively control the auto test switch in the off position to prevent any other spurious test circuit caused signals on Unit 3 and Unit 4 sequencers.
2. Each eight hours a visual inspection will be made of appropriate status lights on the exterior door of the Unit 3 and Unit 4 sequencers.
3. Every 24 hours the sequencer doors will be opened to verify appropriate status lights on the inside of the cabinet.
4. A manual test of the sequencer is scheduled to be performed according to procedure once each 30 days. This frequency and method of performance of the surveillance may be modified based upon further root cause analysis.

V. ADDITIONAL INFORMATION

A. Similar Events

None.

B. Additional Information

A supplemental Licensee Event Report will be provided upon completion of further root cause analysis.

C. Failed Parts

Manufacturer: Allen - Bradley
 Model Number: Output Module 1771-OW
 Vendor: United Controls Inc.

