

CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9712030199 . DOC.DATE: 97/11/26 NOTARIZED: NO DOCKET #
FACIL: 50-335 St. Lucie Plant, Unit 1, Florida Power & Light Co. 05000335
AUTH.NAME AUTHOR AFFILIATION
REVELL, J. Florida Power & Light Co.
STALL, J.A. Florida Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 97-010-00: on 971027, inadvertant core alteration prohibited by TS occurred. Caused by CEA failure to detach from UGS. Safety evaluation was performed & procedural rev made to continue UGS move. W/971126 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 5
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Florida Power & Light Company, 6501 South Ocean Drive, Jensen Beach, FL 34957

November 26, 1997

L-97-297
10 CFR 50.73

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

Re: St. Lucie Unit 1
Docket No. 50-335
Reportable Event: 97-010
Date of Event: October 27, 1997
Inadvertant Core Alteration Prohibited by Technical Specifications
Due to Stuck Control Element Assembly (CEA)

The attached Licensee Event Report is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event.

Very truly yours,

J. A. Stall
Vice President
St. Lucie Plant

JAS/JWR

Attachment

cc: Regional Administrator, USNRC, Region II
Senior Resident Inspector, USNRC, St. Lucie Plant

11-26-97
11

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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: 60.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-8 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20566-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

ST LUCIE UNIT 1

DOCKET NUMBER (2)

05000335

PAGE (3)

1 OF 4

TITLE (4)

Inadvertant Core Alteration Prohibited by Technical Specifications Due to Stuck Control Element Assembly (CEA)

| 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 |
| 10 | 27 | 97 | 97 | -- 010 | -- 00 | 11 | 26 | 97 | FACILITY NAME | DOCKET NUMBER |

| OPERATING MODE (9) | POWER LEVEL (10) | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11) | | | | | | | | |
|--------------------|------------------|---|--|--------------------|---|------------------|--|-------------------|---|--|
| 6 | 000 | 20.2201(b) | | 20.2203(a)(2)(v) | X | 50.73(a)(2)(i) | | 50.73(a)(2)(viii) | | |
| | | 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)(iii) | | 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 | TELEPHONE NUMBER (Include Area Code) |
| Jack Revell, Licensing Engineer | (561) 467-7169 |

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

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPRDS | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPRDS |
|-------|--------|-----------|--------------|---------------------|-------|--------|-----------|--------------|---------------------|
| X | AC | RCT | C490 | N | | | | | |

SUPPLEMENTAL REPORT EXPECTED (14)

| | | | | | | |
|---|--|----|-------------------------------|-------|-----|------|
| X | YES (If yes, complete EXPECTED SUBMISSION DATE). | NO | EXPECTED SUBMISSION DATE (15) | MONTH | DAY | YEAR |
| | | | | 02 | 04 | 98 |

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On October 27, 1997, St. Lucie Unit 1 was in Mode 6 with the reactor head removed in preparation for defueling. The containment equipment hatch and personnel access airlock were open, as allowed by Technical Specifications. Personnel commenced Upper Guide Structure (UGS) withdrawal from the reactor vessel in accordance with procedures. As the UGS cleared the alignment pins, a Control Element Assembly (CEA) was discovered attached to the UGS, and had been unexpectedly withdrawn from the core. This constituted a core alteration without the containment penetration status required by Technical Specifications. Containment integrity was set within about 20 minutes of discovery of the stuck CEA.

The cause of the CEA remaining attached to the UGS could not immediately be determined. A safety evaluation was performed and a procedural revision made to continue the UGS move. Reactor cavity water level was raised to increase shielding. Anticipating elevated containment radiation levels, the Containment Isolation System (CIS) was manually actuated prior to continuing the lift.

The UGS lift recommenced on October 28. A remote camera situated beneath the UGS monitored the progress, and the CEA remained attached throughout the transit. Once the transit to the refueling cavity was completed, the CEA was recovered from the UGS. The root cause of the event is still under investigation. Further corrective actions will be identified once the root cause is determined.

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

DESCRIPTION OF THE EVENT

On October 27, 1997, St. Lucie Unit 1 was in Mode 6 with the reactor head [EIIS:AB:RCT] removed in preparation for reactor defueling. The containment equipment hatch and personnel access airlock [EIIS:NH] were open, as allowed by Technical Specifications. Control Element Assemblies (CEAs) [EIIS:AA] had been unlatched by personnel in accordance with procedure OP1-0110022, 'Coupling and Uncoupling of CEA Extension Shafts'. At approximately 1510, the reactor cavity water level was raised to 55 feet 6 inches to maintain adequate shielding in preparation for lifting the Upper Guide Structure (UGS) [EIIS:AC]. Normally during the lift, only the UGS lift rig is raised above the surface of the water.

At approximately 1658, contract personnel commenced UGS withdrawal from the reactor vessel in accordance with procedure 1-M-0015, 'Reactor Vessel Maintenance - Sequence of Operations'. During the evolution, a camera mounted at the reactor vessel flange level was used to verify lift alignment and clearance. At approximately 1744, as the UGS cleared the alignment pins, a CEA was discovered attached to the UGS, and had been unexpectedly withdrawn from the core. Operations ordered containment integrity to be set, and this was achieved by 1805.

The cause of the CEA remaining attached to the UGS could not immediately be determined. A safety evaluation was performed which concluded that there would be no adverse impact on plant safety or operation should the CEA fall onto the core while completing the UGS move. Procedure 1-M-0015, 'Reactor Vessel Maintenance - Sequence of Operations', was revised to accommodate movement of the UGS with a CEA attached. Since the UGS and lift rig were to be lifted much higher than normal, reactor cavity water level was adjusted to 60 feet to increase shielding. This action was completed at approximately 2222 hours.

In anticipation of receiving high enough containment radiation levels to initiate a Containment Isolation Actuation Signal (CIAS), unnecessary personnel left containment and the Containment Isolation System (CIS) [EIIS:JM] was manually actuated at approximately 0253 on October 28. This was a preplanned actuation performed in accordance with procedure OP1-1600023, 'Refueling Sequencing Guidelines'.

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

The UGS lift recommenced at approximately 0320 with only essential personnel in containment. A remote camera situated beneath the UGS monitored the progress, and the CEA remained firmly attached throughout the transit. At approximately 0324, CIAS channels indicated that containment radiation levels had reached the CIAS initiation threshold. Channel MD, with the most direct exposure to the UGS, registered an area radiation rate of approximately 7 REM per hour, while the other three channels indicated approximately 100 millirem per hour. CIS actuates automatically with two channels greater than or equal to 90 millirem per hour.

Once the transit to the refueling cavity was completed, attempts were made to free the CEA but were initially unsuccessful. Subsequently, the CEA was disengaged by operating personnel. The CEA was retrieved and moved to the spent fuel pool for storage. It was identified as CEA 24, a Type 1, full length CEA manufactured by Combustion Engineering.

CAUSE OF THE EVENT

The cause of the event was failure of the CEA to detach from the UGS. It is currently undetermined whether the CEA was partially latched or friction fit to the CEA Extension Shaft. The root cause is still under investigation.

A supplement to this LER will be issued describing the findings of root cause evaluation for the stuck CEA.

ANALYSIS OF THE EVENT

This event is reportable under 10 CFR 50.73 (a)(2)(i)(B) as "Any operation or condition prohibited by the plant's Technical Specifications." The Technical Specification violated is Unit 1 Technical Specification 3.9.4:

"The containment penetrations shall be in the following status:

- a. The equipment door closed and held in place by a minimum of four bolts,
- b. A minimum of one door in each airlock is closed, and
- c. Each penetration providing direct access from the containment atmosphere to the outside atmosphere shall be... (several configurations given).

APPLICABILITY: During CORE ALTERATIONS or movement of irradiated fuel within the containment."

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

The Technical Specifications define "core alteration" as "movement or manipulation of any fuel, sources, reactivity control components, or other components affecting reactivity within the reactor vessel with the vessel head removed and fuel in the vessel." Normally, lifting a UGS is not a core alteration, since the UGS does not contain fuel, sources, or components that control or affect reactivity. However, since a reactivity control component (a CEA) was moved with the UGS in this event, a core alteration was performed. Moreover, the core alteration was performed without the containment penetration status required by the Technical Specification. Penetrations were placed in the required state within approximately 20 minutes of discovery of the stuck CEA.

The CIS actuation was not reportable under 10 CFR 50.72, since the actuation was part of a preplanned sequence addressed by procedure. The CIS is designed to mitigate the consequences of accidents which release large amounts of energy within the containment structure. There was no such accident in this case, and the CIS actuation was intentional rather than the result of accident conditions.

Withdrawal of the stuck CEA from the reactor core did not place the plant in an unanalyzed condition, nor did it place the plant in a condition outside its design basis. Plant procedures address the case of a single CEA not inserted in the core, and substantial shutdown margin was maintained during the course of this event.

LER 97-001-00 for St. Lucie Unit 2 documented an event with radiological conditions similar to this event. In the Unit 2 event, an expected CIS actuation occurred as the UGS was withdrawn from the reactor. The elevated radiation levels were caused by irradiated incore instrumentation segments [EIS:IG] which had broken during removal of incores. The Unit 2 event, however, was unlike this event in that there was no core alteration.

CORRECTIVE ACTIONS

Immediate corrective actions included stopping the UGS lift and evaluating dose rates. A condition report was issued and a team was designated to determine the cause of the stuck CEA. The team reviewed potential failure modes and related industry experience, but has not had access to the CEA's extension shaft for evaluation. The unlatch procedure was also reviewed and verified to have been properly performed. Further corrective actions for the stuck CEA will be identified in a supplement to this LER once the root cause has been determined.