Docket No. 50-335

JAN 6 1978

Florida Power & Light Company
ATTN: Dr. Robert E. Uhrig
Vice President
Nuclear and General Engineering
P. O. Box 013100
Miami, Florida 33101

Gentlemen:

The Commission has issued the enclosed Amendment No. 20 to Facility Operating License No. DPR-67 for St. Lucie Plant Unit No. 1. The amendment is in response to your January 4, 1978 application.

The amendment changes the Technical Specifications by modifying the Limiting Conditions for Operation (LCO) on Control Element Assembly (CEA) positions for reactor operation. The change authorizes the insertion of all CEAs a nominal 3 inches from their present position. It is our intention that the CEAs will not be withdrawn above this new normal operating position. If other operating conditions should require the CEA's to be withdrawn above this new normal operating position, you should promptly notify the NRC project manager. Additionally, you should modify the administrative procedures that implement Specification 4.1.3.1.2 to assure that approximately one fourth of the full length CEAs are determined to be operable each week. This will provide earlier detection of any anomalous CEA behavior.

This interim action is being taken pending completion of a long term program to address guide tube wear that is under development. We understand that you intend to evaluate the guide tube wear of the Cycle 1 fuel during or following the fueling outage scheduled to start about March 15, 1978. We request that you promptly provide us with the results of the evaluation of that inspection.

Some portions of the proposed Technical Specifications have been modified to meet our requirements. These modifications have been discussed with and agreed to by your staff.

Const. 1

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OFFICE➤						
SURNAME➤						
DATE➤						

Copies of the related Safety Evaluation and the Notice of Issuance also are enclosed.

Sincerely,
Original Signed by
Don K. Davis

Don K. Davis, Acting Chief
Operating Reactors Branch #2
Division of Operating Reactors

Enclosures:
1. Amendment No. 20 to License No. DPR-67
2. Safety Evaluation
3. Notice

cc w/enclosures:
See next page

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FPL (Teskorgan) was called by D Davis on 1/6/78 to indicate amendment was issued. EAR

OELD
C Woodhead
1/6/78 Same as Calvert Cliffs

OFFICE	DOR:ORB-2	DOR:ORB-2	DOR:STS	DOR:RS	DOR:EB	DOR:ORB-2
SURNAME	EAReeves	RMDiggs:esp	JMcGough	RBaer	LShao	DKDavis
DATE	1/6/78	1/6/78	1/6/78	1/6/78	1/6/78	1/6/78

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

January 6, 1978

Docket No. 50-335

Florida Power & Light Company
ATTN: Dr. Robert E. Uhrig
Vice President
Nuclear and General Engineering
P. O. Box 013100
Miami, Florida 33101

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The amendment changes the Technical Specifications by modifying the Limiting Conditions for Operation (LCO) on Control Element Assembly (CEA) positions for reactor operation. The change authorizes the insertion of all CEAs a nominal 3 inches from their present position. It is our intention that the CEAs will not be withdrawn above this new normal operating position. If other operating conditions should require the CEA's to be withdrawn above this new normal operating position, you should promptly notify the NRC project manager. Additionally, you should modify the administrative procedures that implement Specification 4.1.3.1.2 to assure that approximately one fourth of the full length CEAs are determined to be operable each week. This will provide earlier detection of any anomalous CEA behavior.

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Some portions of the proposed Technical Specifications have been modified to meet our requirements. These modifications have been discussed with and agreed to by your staff.

Copies of the related Safety Evaluation and the Notice of Issuance also are enclosed.

Sincerely,

Don K. Davis, Acting Chief
Operating Reactors Branch #2
Division of Operating Reactors

Enclosures:
1. Amendment No. 20 to
   License No. DPR-67
2. Safety Evaluation
3. Notice

cc w/enclosures:
See next page

cc w/enclosures:
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Ft. Pierce, Florida 33450

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Tallahassee, Florida 32304

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Tallahassee, Florida 32301

Mr. Weldon B. Lewis
County Administrator
St. Lucie County
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Ft. Pierce, Florida 33450

Chief, Energy Systems Analyses
Branch (AW-459)
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U. S. Environmental Protection Agency
Region IV Office
ATTN: EIS COORDINATOR
345 Courtland Street, N. E.
Atlanta, Georgia 30308

UNITED STATES
NUCLEAR REGULATORY COMM. ON
WASHINGTON, D. C. 20555

FLORIDA POWER & LIGHT COMPANY

DOCKET NO. 50-335

ST. LUCIE PLANT UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 20
License No. DPR-67

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Florida Power & Light Company (the licensee) dated January 4, 1978, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and Paragraph 2.C(2) of Facility License No. DPR-67 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 20, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Don K. Davis, Acting Chief
Operating Reactors Branch #2
Division of Operating Reactors

Attachment:
Changes to the Technical
  Specifications

Date of Issuance: January 6, 1978

ATTACHMENT TO LICENSE AMENDMENT NO. 20

FACILITY OPERATING LICENSE NO. DPR-67

DOCKET NO. 50-335

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages are also provided to maintain document completeness.

Pages

3/4 1-22
3/4 1-23
3/4 1-27
3/4 1-28

LIMITING CONDITION FOR OPERATION (Continued)

2. Declared inoperable. After declaring the CEA inoperable, operation in MODES 1 and 2 may continue for up to 7 days per occurrence with a total accumulated time of ≤ 14 days per calendar year provided all of the following conditions are met:

   a) The THERMAL POWER level shall be reduced to ≤ 70% of the maximum allowable THERMAL POWER level for the existing Reactor Coolant Pump combination within one hour; if negative reactivity insertion is required to reduce THERMAL POWER, boration shall be used.

   b) Within one hour after reducing the THERMAL POWER as required by a) above, the remainder of the CEAs in the group with the inoperable CEA shall be aligned to within 7.5 inches of the inoperable CEA while maintaining the allowable CEA sequence and insertion limits shown on Figure 3.1-2; the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation.

e. With one full length CEA misaligned from any other CEA in its group by 15 inches or more, reduce THERMAL POWER to ≤ 70% of the maximum allowable THERMAL POWER level for the existing Reactor Coolant Pump combination within one hour; if negative reactivity insertion is required to reduce THERMAL POWER, boration shall be used. Within one hour after reducing THERMAL POWER as required above, either:

   1. Restore the CEA to within the above specified alignment requirements, or

   2. Declare the CEA inoperable. After declaring the CEA inoperable, POWER OPERATION may continue for up to 7 days per occurrence with a total accumulated time of ≤ 14 days per calendar year provided the remainder of the CEAs in the group with the inoperable CEA are aligned to within 7.5 inches of the inoperable CEA while maintaining the allowable CEA sequence and insertion limits shown on Figure 3.1-2; the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation.

LIMITING CONDITION FOR OPERATION (Continued)

f. With more than one full length CEA inoperable or misaligned from any other CEA in its group by 15 inches (indicated position) or more, be in HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 The position of each full length CEA shall be determined to be within 7.5 inches (indicated position) of all other CEAs in its group at least once per 12 hours except during time intervals when the Deviation Circuit and/or CEA Block Circuit are inoperable, then verify the individual CEA positions at least once per 4 hours.

4.1.3.1.2 Each full length CEA not fully inserted shall be determined to be OPERABLE by inserting it at least 7.5 inches at least once per 31 days.

4.1.3.1.3 The CEA Block Circuit shall be demonstrated OPERABLE at least once per 31 days by a functional test which verifies that the circuit prevents any CEA from being misaligned from all other CEAs in its group by more than 7.5 inches (indicated position).

4.1.3.1.4 The CEA Block Circuit shall be demonstrated OPERABLE by a functional test which verifies that the circuit maintains the CEA group overlap and sequencing requirements of Specification 3.1.3.6 and that the circuit prevents the regulating CEAs from being inserted beyond the Power Dependent Insertion Limit of Figure 3.1-2:

*a. Prior to each entry into MODE 2 from MODE 3, except that such verification need not be performed more often than once per 31 days, and

b. At least once per 6 months.

*The licensee shall be excepted from compliance during the startup test program for an entry into MODE 2 from MODE 3 made in association with a measurement of power defect.

REACTIVITY CONTROL SYSTEMS

PART LENGTH CEA INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

3.1.3.2 All part length CEAs shall be withdrawn to at least 129.0 inches.

APPLICABILITY: MODES 1* and 2*.

ACTION:

With a maximum of one PLCEA withdrawn to less than 129.0 inches, either:

a. Withdraw the PLCEA to at least 129.0 inches within one hour, or

b. Be in HOT STANDBY within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.2 Each part length CEA shall be determined withdrawn to at least 129.0 inches by:

a. Verifying the positions of the PLCEAs prior to increasing THERMAL POWER above 5% of RATED THERMAL POWER, and

b. Verifying, at least once per 31 days, that electric power has been disconnected from its drive mechanism by physical removal of a breaker from the circuit.

*See Special Test Exception 3.10.2.

POSITION INDICATOR CHANNELS

LIMITING CONDITION FOR OPERATION

3.1.3.3 All shutdown, regulating and part length CEA reed switch position indicator channels and CEA pulse counting position indicator channels shall be OPERABLE and capable of determining the absolute CEA positions within ± 2.25 inches.

APPLICABILITY: MODES 1 and 2.

ACTION:

a. With one or more PLCEA reed switch or pulse counting position indicator channels inoperable and the applicable PLCEA fully withdrawn and electric power to its drive mechanism disconnected, operation may continue provided the applicable PLCEA is verified immediately and at least once per 12 hours thereafter to be fully withdrawn by its "Full Out" limit.

b. With a maximum of one reed switch position indicator channel per group or one (except as permitted by ACTION item d. below) pulse counting position indicator channel per group inoperable and the CEA(s) with the inoperable position indicator channel partially inserted, within 6 hours either:

   1. Restore the inoperable position indicator channel to OPERABLE status, or

   2. Be in HOT STANDBY, or

   3. Reduce THERMAL POWER to ≤ 70% of the maximum allowable THERMAL POWER level for the existing Reactor Coolant Pump combination; if negative reactivity insertion is required to reduce THERMAL POWER, boration shall be used. Operation at or below this reduced THERMAL POWER level may continue provided that within the next 4 hours either:

      a) The CEA group(s) with the inoperable position indicator is fully withdrawn while maintaining the withdrawal sequence required by Specification 3.1.3.6 and when this CEA group reaches its fully withdrawn position, the "Full Out" limit of the CEA with the inoperable position indicator is actuated and verifies this CEA to be fully withdrawn. Subsequent to fully withdrawing this CEA group(s), the THERMAL POWER level may be returned to a level consistent with all other applicable specifications; or

SHUTDOWN CEA INSERTION LIMIT

LIMITING CONDITION FOR OPERATION

3.1.3.5 All shutdown CEAs shall be withdrawn to at least 129.0 inches.

APPLICABILITY: MODES 1 and 2*#.

ACTION:

With a maximum of one shutdown CEA withdrawn, except for surveillance testing pursuant to Specification 4.1.3.1.2, to less than 129.0 inches, within one hour either:

a. Withdraw the CEA to at least 129.0 inches, or

b. Declare the CEA inoperable and apply Specification 3.1.3.1.

SURVEILLANCE REQUIREMENTS

4.1.3.5 Each shutdown CEA shall be determined to be withdrawn to at least 129.0 inches:

a. Within 15 minutes prior to withdrawal of any CEAs in regulating groups during an approach to reactor criticality, and

b. At least once per 12 hours thereafter.

*See Special Test Exception 3.10.2.

#With $K_{eff} \geq 1.0$.

REGULATING CEA INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

3.1.3.6 The regulating CEA groups shall be limited to the withdrawal sequence and to the insertion limits shown on Figure 3.1-2 (regulating CEAs are considered to be fully withdrawn in accordance with Figure 3.1-2 when withdrawn to at least 129.0 inches) with CEA insertion between the Long Term Steady State Insertion Limits and the Power Dependent Insertion Limits restricted to:

a. $\leq$ 4 hours per 24 hour interval,

b. $\leq$ 5 Effective Full Power Days per 30 Effective Full Power Day interval, and

c. $\leq$ 14 Effective Full Power Days per calendar year.

APPLICABILITY: MODES 1* and 2*#.

ACTION:

a. With the regulating CEA groups inserted beyond the Power Dependent Insertion Limits, except for surveillance testing pursuant to Specification 4.1.3.1.2, within two hours either:

1. Restore the regulating CEA groups to within the limits, or

2. Reduce THERMAL POWER to less than or equal to that fraction of RATED THERMAL POWER which is allowed by the CEA group position using the above figure.

b. With the regulating CEA groups inserted between the Long Term Steady State Insertion Limits and the Power Dependent Insertion Limits for intervals > 4 hours per 24 hour interval, except during operation pursuant to the provisions of ACTION items c. and d. of Specification 3.1.3.1, operation may proceed provided either:

1. The Short Term Steady State Insertion Limits of Figure 3.1-2 are not exceeded, or

2. Any subsequent increase in THERMAL POWER is restricted to $\leq$ 5% of RATED THERMAL POWER per hour.

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*See Special Test Exceptions 3.10.2 and 3.10.5.

#With $K_{eff} \geq 1.0$.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 20 TO FACILITY OPERATING LICENSE NO. DPR-67

FLORIDA POWER & LIGHT COMPANY

ST. LUCIE PLANT UNIT NO. 1

DOCKET NO. 50-335

INTRODUCTION

Florida Power and Light Company (FPL) has requested that Operating License DPR-67 for St. Lucie Plant Unit No. 1 be amended by changes to the Technical Specifications to permit the insertion limits of the control element assemblies (CEA) to be extended 3 inches farther into the reactor core. FPL proposed these changes to the specifications after being advised by Combustion Engineering (CE), their NSSS supplier, that repositioning the CEAs would minimize the probability of excessive local guide tube wear and improve assurance that control rods would insert. Notice of these precautionary measures was provided by CE to the owners of all operating CE reactors after observing significant guide tube wear at Millstone Unit No. 2 during the first scheduled refueling and maintenance outage initiated on November 20, 1977.

DISCUSSION AND EVALUATION

Indications of wear damage in the CEA guide tubes of control rodded fuel assemblies were discovered by CE during a visual fuel inspection program at Millstone 2 in conjunction with routine refueling operations. A meeting was held on December 19, 1977, in Bethesda, Maryland, between CE and the NRC staff with affected licensees in attendance to discuss the wear damage on the guide tubes discovered at Millstone 2, and the susceptibility of other CE reactors to similar problems. CE concluded that although other reactors were susceptible, continued operation would not endanger the health and safety of the public. (See letter from A. E. Scherer to V. Stello and proprietary Attachment 1 - CEA Guide Tube Wear Report, dated December 23, 1977). CE recommended that the proposed interim solution of inserting the control rods 3" farther into the reactor core be adopted for 90 days until a program for addressing long term guide tube wear could be provided.

The CEA guide tubes serve in a dual capacity as the primary structural members of the fuel assembly and as guiding channels for the control rods during insertion. Guide tube wear has occurred as a result of rubbing between the Inconel 625 control rod and the softer Zircaloy-4 guide tube. Although the mechanism for the observed rubbing has not yet been determined, CE has evaluated the consequences and has shown that guide tubes degraded to a calculated maximum are able to withstand the mechanical loads to which they are or may be subjected. This evaluated maximum wear is based on limits imposed by the geometry of the reactor internals.

The mechanical integrity of the guide tubes was evaluated by CE for this worst case wear for loadings during normal operation, anticipated operational occurrences, accidents and refueling.

This excessive guide tube wear has only been observed at the location of the control rod tips in the "full up" position. Similar wear has been identified by CE in an out-of-pile hot loop test facility. It has also been found on several guide tubes at Maine Yankee. The wear process is time dependent and relatively slow. Complete through wall local wear was experienced at Millstone 2 after approximately 14,000 hours of operation. Repositioning the control rods will provide a new wearing surface and thus delay further local wall thinning at the old "full out" position. Significant wear at the new location for an interim period of time, until a long term solution is developed, is not expected to occur based upon observations of the rate of wear at Millstone 2 and at the CE hot loop test facility.

Scrammability of the control rods in worn guide tubes was also evaluated and was determined to be acceptable. Nevertheless, to provide further assurance that scram will not be impaired, CE has recommended the new position to ensure that a rod will not hang up on the worn area of the guide tube wall. The staff concurs that the 3 inch insertion of the CEAs will provide interim assurance that the CEAs will insert upon demand. Upon completion of the CE program for addressing the long term guide tube wear problem (approximately 90 days hence), an evaluation will be made regarding a permanent solution of this problem.

FPL has performed reactivity calculations modeling shutdown and regulating control rod banks in their fully withdrawn position and inserted 3 inches into the active fuel region of the core. The predicted incremental reactivity worth is approximately 0.035% $\Delta\rho$ at the beginning of cycle (BOC) and increase to about 0.07% $\Delta\rho$ at end of cycle (EOC). This is well within the 0.3% $\Delta\rho$ normally allowed for CEA bite as defined in safety analysis reports. Therefore, adequate excess shutdown remains and hence the change in reactivity worth is considered acceptable by the staff. It is noted that the small insertion of the shutdown and regulating banks will incrementally decrease scram reactivity times.

The licensee has evaluated the effect of the inserted rods on predicted axial power distribution. Licensee calculations show a small change of approximately 0.5% in the calculated nominal full power distribution at BOC conditions when power peaks are most limiting. They state that the increased peak is well within the bounds of the power distributions used in the Reactor Protective System setpoint analysis. The axial power distributions used in the setpoint analysis were generated assuming load follow operations and free running Xenon oscillations. Hence the family of curves considered in the setpoint analysis would span the subset of anticipated axial power distribution corresponding to the revised rod positions. Based on these reasons, the staff concurs with the licensee's assertion.

The insertion of the shutdown and regulating CEA groups will increase ultimate control rod tip fluence and concommittant rod tip burnup and internal gas pressures. Increased control rod tip fluence has not been addressed by the licensee nor need it be addressed in the immediate future. Should the revised insertion limits be applicable to future fuel cycles revised fluence estimates should be made and factored into the assessment of the CEA design lifetimes.

ENVIRONMENTAL CONSIDERATION

We have determined that this amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and pursuant to 10 CFR §51.5(d)(4) that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of the planned amendment.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of the planned amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: January 6, 1978

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-335

FLORIDA POWER & LIGHT COMPANY

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 20 to Facility Operating License No. DPR-67, issued to Florida Power & Light Company (the licensee), which revised the license and its appended Technical Specifications for operation of St. Lucie Plant Unit No. 1 (the facility) located in St. Lucie County, Florida. The amendment is effective as of its date of issuance.

The amendment changes the Technical Specifications by modifying the Limiting Conditions for Operation (LCO) on Control Element Assembly (CEA) positions for reactor operation. The change authorizes the insertion of all CEAs a nominal 3 inches from their present position. Deeper insertion of the CEAs will provide a new wearing surface for the CEA guide tubes. This interim action is being taken pending completion of the program to address the long term guide tube wear problem under development.

The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment. Prior public notice of the amendment was not required since the amendment does not involve a significant hazards consideration.

The Commission has determined that the issuance of the amendment will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of this amendment.

For further details with respect to this action, see (1) the application for amendment dated January 4, 1978, (2) Amendment No. 20 to License No. DPR-67, and (3) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at the Indian River Junior College Library, 3209 Virginia Avenue, Ft. Pierce, Florida 33450. A single copy of items (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C., Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland, this 6th day of January, 1978.

FOR THE NUCLEAR REGULATORY COMMISSION

Don K. Davis, Acting Chief
Operating Reactors Branch #2
Division of Operating Reactors