

April 14, 1993

Docket No. 50-335

DISTRIBUTION
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Mr. J. H. Goldberg
President - Nuclear Division
Florida Power and Light Company
P.O. Box 14000
Juno Beach, Florida 33408-0420

Dear Mr. Goldberg:

SUBJECT: ST. LUCIE UNIT 1 - ISSUANCE OF AMENDMENT RE: EMERGENCY BUS
UNDERVOLTAGE PROTECTION DEVICES (TAC NO. M85122)

The Commission has issued the enclosed Amendment No. 121 to Facility Operating License No. DPR-67 for the St. Lucie Plant, Unit No. 1. This amendment consists of changes to the Technical Specifications in response to your application dated November 30, 1993.

This amendment revises Technical Specifications Tables 3.3-3, 3.3-4, and 4.3-2 where they apply to the Emergency Bus Undervoltage Protection Devices and will permit improvements to be made in the undervoltage protective relaying scheme.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

(Original Signed By)

Jan A. Norris, Senior Project Manager
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 121 to DPR-67
2. Safety Evaluation

cc w/enclosures:
See next page

OFC	:LA:PDII-2	:PM:PDII-2	:D:PDII-2	:OGC	:	:
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DATE	:4/6/93	:4/7/93	:4/7/93	:4/4/93	:	:

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St. Lucie Plant

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MEMORANDUM DATED: April 14, 1993

AMENDMENT NO. 121 TO FACILITY OPERATING LICENSE NO. DPR-67 - ST. LUCIE, UNIT 1

~~Docket File~~

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

FLORIDA POWER & LIGHT COMPANY

DOCKET NO. 50-335

ST. LUCIE PLANT UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 121
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 November 30, 1993, 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.

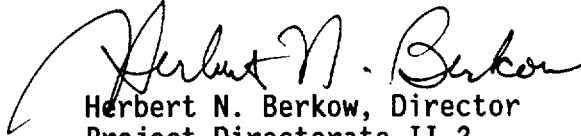
2. Accordingly, Facility Operating License No. DPR-67 is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and by amending paragraph 2.C.(2) to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 121, 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 its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Herbert N. Berkow, Director
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: April 14, 1993

ATTACHMENT TO LICENSE AMENDMENT NO. 121

TO 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.

Remove Pages

3/4 3-11

3/4 3-15

3/4 3-19

Insert Pages

3/4 3-11

3/4 3-15

3/4 3-19

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
5. CONTAINMENT SUMP RECIRCULATION (RAS)					
a. Manual RAS (trip Buttons)	2	1	2	1, 2, 3, 4	8
b. Refueling Water Tank - Low	4	2	3	1, 2, 3	9#
6. LOSS OF POWER					
a. 4.16 kv Emergency Bus Under-voltage (Loss of Voltage)	2/Bus	2/Bus	1/Bus	1, 2, 3	12
b. 4.16 kv Emergency Bus Under-voltage (Degraded Voltage)	2/Bus	2/Bus	1/Bus	1, 2, 3	12
c. 480 V Emergency Bus Under-voltage (Degraded Voltage)	2/Bus	2/Bus	1/Bus	1, 2, 3	12
7. AUXILIARY FEEDWATER (AFAS)					
a. Manual (Trip Buttons)	4/SG	2/SG	4/SG	1, 2, 3	11
b. Automatic Actuation Logic	4/SG	2/SG	3/SG	1, 2, 3	8
c. SG Level (1A/1B) - Low	4/SG	2/SG	3/SG	1, 2, 3	13#, 14
8. AUXILIARY FEEDWATER ISOLATION					
a. SG 1A - SG 1B Differential Pressure	4/SG	2/SG	3/SG	1, 2, 3	13#, 14
b. Feedwater Header SG 1A - SG 1B Differential Pressure	4/SG	2/SG	3/SG	1, 2, 3	13#, 14

ST. LUCIE - UNIT 1

3/4 3-11

Amendment No. 15, 37, 58, 72, 102, 121

TABLE 3.3-3 (Continued)

TABLE NOTATION

- (a) Trip function may be bypassed in this MODE when pressurizer pressure is < 1725 psia; bypass shall be automatically removed when pressurizer pressure is ≥ 1725 psia.
- (b) An SIAS signal is first necessary to enable CSAS logic.
- (c) Trip function may be bypassed in this MODE below 685 psig; bypass shall be automatically removed at or above 685 psig.
- # The provisions of Specification 3.0.4 are not applicable.

ACTION STATEMENTS

- ACTION 8 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- ACTION 9 - With the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:
 - a. The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. For the purposes of testing and maintenance, the inoperable channel may be bypassed for up to 48 hours from time of initial loss of OPERABILITY; however, the inoperable channel shall then be either restored to OPERABLE status or placed in the tripped condition.
 - b. Within one hour, all functional units receiving an input from the inoperable channel are also placed in the same condition (either bypassed or tripped, as applicable) as that required by a. above for the inoperable channel.
 - c. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be bypassed for up to 48 hours while performing tests and maintenance on that channel provided the other inoperable channel is placed in the tripped condition.

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

<u>FUNCTIONAL UNIT</u>	<u>TRIP VALUE</u>	<u>ALLOWABLE VALUES</u>
6. LOSS OF POWER		
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	≥ 2900 volts with a $1 \pm .5$ second time delay	≥ 2900 volts with a $1 \pm .5$ second time delay
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	≥ 3831 volts with a 18 ± 2 second time delay	≥ 3831 volts with a 18 ± 2 second time delay
c. 480 volts Emergency Bus Undervoltage (Degraded Voltage)	≥ 415 volts with a ≤ 9 second time delay	≥ 415 volts with a ≤ 9 second time delay
7. AUXILIARY FEEDWATER (AFAS)		
a. Manual (Trip Buttons)	Not Applicable	Not Applicable
b. Automatic Actuation Logic	Not Applicable	Not Applicable
c. SG 1A & 1B Level Low	$\geq 19.0\%$	$\geq 18.0\%$
8. AUXILIARY FEEDWATER ISOLATION		
a. Steam Generator ΔP -High	≤ 275 psid	89.2 to 281 psid
b. Feedwater Header High ΔP	≤ 150.0 psid	56.0 to 157.5 psid

ST. LUCIE - UNIT 1
3/4 3-15
Amendment No. 37, 58, 74, 102, 105, 121

TABLE 3.3-5

ENGINEERED SAFETY FEATURES RESPONSE TIMES

<u>INITIATING SIGNAL AND FUNCTION</u>	<u>RESPONSE TIME IN SECONDS</u>
1. <u>Manual</u>	
a. SIAS	
Safety Injection (ECCS)	Not Applicable
Containment Fan Coolers	Not Applicable
Feedwater Isolation	Not Applicable
Containment Isolation	Not Applicable
b. CSAS	
Containment Spray	Not Applicable
c. CIS	
Containment Isolation	Not Applicable
Shield Building Ventilation System	Not Applicable
d. RAS	
Containment Sump Recirculation	Not Applicable
e. MSIS	
Main Steam Isolation	Not Applicable
Feedwater Isolation	Not Applicable
f. AFAS	
Auxiliary Feedwater Actuation	Not Applicable
2. <u>Pressurizer Pressure-Low</u>	
a. Safety Injection (ECCS)	≤ 30.0*/19.5**
b. Containment Isolation ***	≤ 30.5*/20.5**
c. Containment Fan Coolers	≤ 30.0*/17.0**
d. Feedwater Isolation	≤ 60.0

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>FUNCTIONAL TEST</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
6. LOSS OF POWER				
a. 4.16 kv Emergency Bus Under-voltage (Loss of Voltage)	S	R	M	1, 2, 3
b. 4.16 kv Emergency Bus Under-voltage (Degraded Voltage)	S	R	M	1, 2, 3
c. 480 V Emergency Bus Under-voltage (Degraded Voltage)	S	R	M	1, 2, 3
7. AUXILIARY FEEDWATER (AFAS)				
a. Manual (Trip Buttons)	N.A.	N.A.	R	1, 2, 3
b. SG Level (A/B) - Low	S	R	M	1, 2, 3
c. Automatic Actuation Logic	N.A.	N.A.	M	1, 2, 3
8. AUXILIARY FEEDWATER ISOLATION				
a. SG Level (A/B) - Low and SG Differential Pressure (BtoA/AtoB) - High	N.A.	R	M	1, 2, 3
b. SG Level (A/B) - Low and Feedwater Header Differential Pressure (BtoA/AtoB) - High	N.A.	R	M	1, 2, 3

TABLE 4.3-2 (Continued)

TABLE NOTATION

- (1) The logic circuits shall be tested manually at least once per 31 days.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 121

TO FACILITY OPERATING LICENSE NO. DPR-67

FLORIDA POWER & LIGHT COMPANY

ST. LUCIE PLANT, UNIT NO. 1

DOCKET NO. 50-335

1.0 INTRODUCTION

The existing undervoltage protection scheme at St. Lucie consists of three sets of two (2) solid state undervoltage definite time relays. One set provides a "loss of voltage" function (trip at 2900 +/- 29 volts, 1 +/- 0.5 seconds) and the other two sets (undervoltage device #1 and undervoltage device #2) serve as "degraded voltage" sensors (trip at 3675 +/- 36 volts, 7 +/- 1 minutes; and 3592 +/- 36 volts, 18 +/- 2 seconds respectively). This design provides undervoltage/degraded voltage protection for the 4160 and 480 volt system equipment under non-accident conditions. In addition, each 480 volt Class 1E bus has one set of two (2) solid state undervoltage relays with internal adjustable timers (set at 429 +5, -0 volts; 7 +/- 1 seconds) to provide "degraded voltage" protection for the 4160 and 480 volt system equipment during accident conditions. Florida Power and Light Company (FPL) re-analyzed their station auxiliary system and determined that an improvement to the undervoltage relay setpoints could be made. By letter dated November 30, 1992, FPL proposed a revision to the Technical Specifications Tables 3.3-3, 3.3-4, and 4.3.2 to change the setpoints for the emergency bus undervoltage protection scheme relays for both accident and non-accident conditions.

2.0 EVALUATION

The licensee used Ebasco Services Incorporated computer program AUXSYS4078 to analyze the system and equipment voltages for both steady-state and transient conditions for the station auxiliary system. Analysis of the "Arkansas Scenario" (NRC Information Notice 79-04), which postulates starting all safety injection actuated signal (SIAS) initiated loads with the auxiliary system under full power operation, was performed in two stages: (1) the first stage assumed simultaneous starting of all large SIAS loads. The results were used to evaluate the adequacy of the system voltages for starting large 4000 volt and 460 volt motors and to verify that voltages at the 480 volt motor control centers (MCC) did not reach contactor dropout levels. The time period of the

first stage was considered to be approximately 5 seconds (based on manufacturer's acceleration time data for large motors); (2) the second stage examined the start of smaller 460 volt motors after system voltages had stabilized following start of the large motors. The licensee states that nominal setpoints and tolerances are calculated considering test instrument, relay, and potential transformer errors.

The licensee has proposed to change the trip and allowable values for the 4.16 kV emergency bus undervoltage (loss of voltage) relay set points from 2900 +/- 29 volts to greater than or equal to 2900 volts with no change to the existing time delay of 1 +/- 0.5 seconds. We have determined that this change duplicates the format presently used in the corresponding Technical Specifications for St. Lucie Unit 2 which has been analyzed and based on that analysis, is acceptable for Unit 1.

The licensee's re-analyses also indicated that two different trip setpoints for 4.16 kV undervoltage Device #1 and undervoltage Device #2 which were required for equipment protection are no longer required. Rather, a single setpoint is sufficient to assure that acceptable voltages are available to Class 1E equipment during non-accident conditions of degraded grid voltage. The licensee has proposed to modify the undervoltage Device #1 to alarm the undervoltage conditions in the main control room, and the setpoint and the associated time delay will provide an early warning of the sustained grid voltage disturbances. The licensee has proposed to change the trip setpoint of the undervoltage Device #2 from 3592 +/- 36 volts to not less than 3831 volts with no change to the existing time delay range of 18 +/- 2 seconds. The licensee has determined that this is the voltage level at or above which (equivalent to 415 volts at the 480 volt load center bus under normal operating load conditions and minimum expected transmission system voltage of 230 kV), operation of all the station auxiliary equipment under non-accident conditions is assured. The time delay of 18 +/- 2 seconds allows start of the largest 4000 volt motor (4000 HP condensate pump) on the fully loaded auxiliary system without causing a spurious trip. These settings assure that the Class 1E equipment will not be subjected to sustained degraded voltages under non-accident conditions and the settings are, therefore, acceptable.

In addition, the licensee has proposed to change the 480 volt emergency bus undervoltage (degraded voltage) setpoints under accident conditions from 429 +5 -0 volts with a 7 +/- 1 second time delay to greater than or equal to 415 volts with a less than or equal to 9 second time delay. This will assure adequate starting voltage and continued safe operation of equipment under accident conditions (415 volts at the 480 volt load center which corresponds to 3850 volts on the 4.16 kV bus coincident with SIAS). The time is sufficiently long to allow bus voltage recovery following start of all required safety equipment and does not exceed the time delay assumed in the accident analyses for connecting the emergency bus to the diesel generator. We find this to be acceptable.

The licensee has also evaluated the proposed change with respect to overload protection of systems and motors. The setpoint changes will not result in inadvertent actuation of overload protective devices for the individual loads. With the new settings, all the 480 volt system motors will be operating with terminal voltages not less than 400 volts (not more than 115% of rated current). The thermal overload (TOL) devices for the motors are set to trip at 125% of the overload heater rated current which assures that the TOL devices will not trip under degraded voltage conditions.

The licensee further states that the proposed trip and allowable values are provided in a "greater than/equal" or "lesser than/equal" format to specify only the limiting values for the undervoltage/degraded voltage protective function. This type of value specification duplicates the format presently used in corresponding Technical Specifications for St. Lucie 2.

3.0 TECHNICAL FINDING

The staff has evaluated the licensee's submittal and has concluded that the new undervoltage relay setpoints offer full protection to the Class 1E systems and equipment during both accident and non-accident conditions. The proposed trip and allowable values for the 4.16 kV emergency bus undervoltage (Loss of Voltage) in a "greater than/equal" format duplicates the format presently used in corresponding Technical Specifications for St. Lucie 2 and the change is, therefore, acceptable. The proposed trip and allowable values for the 4.16 kV emergency bus undervoltage (degraded voltage) relay setpoints under non-accident conditions will alert operators to the sustained undervoltage conditions and will initiate separation from the offsite power and transfer to the onsite sources if the voltage does not recover to acceptable levels within the allotted time periods. This is in accordance with the Branch Technical Position PSB-1 and the proposed change to the degraded voltage setpoints is, therefore, acceptable. The proposed trip and allowable values for the 480 volt emergency bus undervoltage (degraded voltage) relay setpoints during accident conditions will protect the 4160 volt and 480 volt systems equipment, will assure adequate starting voltage and continued safe operation of all the equipment and the proposed change is, therefore, acceptable.

4.0 STATE CONSULTATION

Based upon the written notice of the proposed amendment, the Florida State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

This amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this

amendment involves no significant hazards consideration and there has been no public comment on such finding (58 FR 5431). Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: N. K. Trehan

Date: April 14, 1993