

UNITED STATES NUCLEAR REGULATORY COMMISSION 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. 45 ----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 July 23, 1981, 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 provision 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.

8111230021





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) <u>Technical Specifications</u>

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 45, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION V Δ Robert A. Clark, Chief

Operating Reactors Branch #3 Division of Licensing

Attachment: Changes to the Technical Specifications

'n

Date of Issuance: November 3, 1981





# ATTACHMENT'TO LICENSE AMENDMENT NO. 45

## 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	•	•	- •		:	1 80	
2-4		-		•			
2-5							
B 2-5							
3/4 1-1				•			
3/4 1-2							
3/4 3-4							
3/4 3-12							•
3/4 3-14	-	· •			•		
3/4 4-1						•	
B 3/4 1-1							

TAB	LE	2.	2-	1

		. <u>REACTOR PROTECT</u>	IVE INSTRUMENTATION TRIP SETPOINT L	<u>.IMITS</u>
	FUN	ICTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
•	<b>]</b> 1.	Manual Reactor Trip	Not Applicable	Not Applicable
•	2.	Power Level - High (1)	:	
·	•	Four Reactor Coolant Pumps Operating	$\leq$ 9.61% above THERMAL POWER, with a minimum setpoint of 15% of RATED THERMAL POWER, and a maximum of $\leq$ 107.0% of RATED THERMAL POWER.	< 9.61% above THERMAL POWER, and a minimum setpoint of 15% of RAT THERMAL POWER and a maximum of < 107.0% of RATED THERMAL POWER.
	3.	Reactor Coolant Flow - Low (1)	, ,	
;		Four Reactor Coolant Pumps Operating	> 95% of design reactor coolant flow with 4 pumps operating*	> 95% of design reactor coolant flow with 4 pumps operating*
•	4.	Pressurizer Pressure - High	<u>&lt;</u> 2400 psia · · · ·	<u>&lt;</u> 2400 psia
k	5.	Containment Pressure - High	<u>&lt;</u> 3.3 psig	<u>&lt;</u> 3.3 ps.ig
	6.	Steam Generator Pressure - Low (2)	<u>&gt;</u> 600 psia	<u>&gt;</u> 600 psia
	7.	Steam Generator Water Level -Low	> 37.0% Water Level - each steam generator	> 37.0% Water Level - each steam generator
	8.	Local Power Density - High (3)	Trip setpoint adjusted to not exceed the limit lines of Figures 2.2-1 and 2.2-2	Trip set point adjusted to not exceed the limit lines of Figures 2.2-1 and 2.2-2.
	*De	sign reactor coolant flow with 4 pum	aps operating is 370,000 gpm. 🙁	:
			t	· · · · · ·

...

:

."

ST. LUCIE - UNIT 1

2-4

Amendment No. 3, 27, /32, 45

FUNCTIONAL UNIT	TRIP SETPOINT		ALLOWABLE VALUES
9. Thermal Margin/Low Pressure (1)			
Four Reactor Coolant Pumps Operating	Trip setpoint adjusted to not exceed the limit lines of Figures 2.2-3 and 2.2-4.	:	Trip setpoint adjusted to no exceed the limit lines of Figures 2.2-3 and 2.2-4.
9a. Steam Generator Pressure Difference High (1) (logic in TM/LP)	<u>&lt;</u> 135 psid		<u>&lt;</u> 135 psid
10. Loss of Turbine Hydraulic Fluid Pressure - Low (3)	<u>&gt;</u> 800.psig	•	<u>&gt;</u> 800 psig

# TABLE NOTATION

- (1) Trip may be bypassed below 1% of RATED THERMAL POWER; bypass shall be automatically removed when THERMAL POWER is  $\geq 1\%$  of RATED THERMAL POWER.
- (2) Trip may be manually bypassed below 685 psig; bypass shall be automatically removed at or above 685 psig.
- (3) Trip may be bypassed below 15% of RATED THERMAL POWER; bypass shall be automatically removed when THERMAL POWER is  $\geq$  15% of RATED THERMAL POWER.
- (4) Trip may be bypassed below  $10^{-4}$ % and above 15% of RATED THERMAL POWER.

ST.

LUCIE

- UNIT

2-5

Amendme

ไว้.

27, 43, 45

2.2 LIMITING SAFETY SYSTEM SETTINGS

BASES

Y,

# Reactor Coolant Flow-Low (Continued)

### Pressurizer Pressure-High

The Pressurizer Pressure-High trip, backed up by the pressurizer code safety valves and main steam line safety valves, provides reactor coolant, system protection against overpressurization in the event of loss of load without reactor trip. This trip's setpoint is 100 psi below the nominal lift setting (2500 psia) of the pressurizer code safety valves and its concurrent operation with the power-operated relief valves avoids the undesirable operation of the pressurizer code safety valves.

### Containment Pressure-High

The Containment Pressure-High trip provides assurance that a reactor trip in initiated concurrently with a safety injection.

#### Steam Generator Pressure-Low

The Steam Generator Pressure-Low trip provides protection against an excessive rate of heat extraction from the steam generators and subsequent cooldown of the reactor coolant. The setting of 600 psia is sufficiently below the full-load operating point of 800 psig so as not

IST. LUCIE - UNIT 1

B 2-5

### LIMITING SAFETY SYSTEM SETTINGS

BASES

### <u>Steam Generator Pressure-Low</u> (Continued)

to interfere with normal operation, but still high enough to provide the required protection in the event of excessively high steam flow. This setting was used with an uncertainty factor of  $\pm$  22 psi in the accident analyses.

### Steam Generator Water Level - Low

The Steam Generator Water Level-Low trip provides core protection by preventing operation with the steam generator water level below the minimum volume required for adequate heat removal capacity and assures that the design pressure of the reactor coolant system will not be exceeded due to loss of steam generator heat sink. The specified setpoint provides allowance that there will be sufficient water inventory in the steam generators at the time of trip to provide a margin of more than 10 minutes before auxiliary feedwater is required.

### Local Power Density-High

The local Power Density-High trip, functioning from AXIAL SHAPE INDEX monitoring, is provided to ensure that the peak local power density in the fuel which corresponds to fuel centerline melting will not occur as a consequence of axial power maldistributions. A reactor trip is initiated whenever the AXIAL SHAPE INDEX exceeds the allowable limits of Figure 2.2-2. The AXIAL SHAPE INDEX is calculated from the upper and lower ex-core neutron detector channels. The calculated setpoints are generated as a function of THERMAL POWER level with the allowed CEA group position being inferred from the THERMAL POWER level. The trip is automatically bypassed below 15 percent power.

The maximum AZIMUTHAL POWER TILT and maximum CEA misalignment permitted for continuous operation are assumed in generation of the setpoints. In addition, CEA group sequencing in accordance with the Specifications 3.1.3.5 and 3.1.3.6 is assumed. Finally, the maximum insertion of CEA banks which can occur during any anticipated operational occurrence prior to a Power Level-High trip is assumed.

ST. LUCIE - UNIT 1

B 2-6

Amendment No. 27

3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL

SHUTDOWN MARGIN -  $T_{avg} > 200^{\circ}F$ 

LIMITING CONDITION FOR OPERATION

3.].1.1 The SHUTDOWN MARGIN shall be  $\geq$  5.0%  $\Delta k/k$ .

APPLICABILITY: MODES 1, 2\*, 3 and 4.

ACTION:

With the SHUTDOWN MARGIN <  $5.0\% \Delta k/k$ , immediately initiate and continue boration at > 40 gpm of 1720 ppm boron or equivalent until the required SHUTDOWN MARGIN is restored.

SURVEILLANCE REQUIREMENTS

4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be >  $5.0\% \Delta k/k$ :

- a. Within one hour after detection of an inoperable CEA(s) and at least once per 12 hours thereafter while the CEA(s) is inoperable. If the inoperable CEA is immovable or untrippable, the above required SHUTDOWN MARGIN shall be increased by an amount at least equal to the withdrawn worth of the immovable or untrippable CEA(s).
- b. When in MODES 1 or  $2^{\#}$ , at least once per 12 hours by verifying that CEA group withdrawal is within the Power Dependent Insertion Limits of Specification 3.1.3.6.
- c. When in MODE  $2^{\#\#}$ , at least once during CEA withdrawal and at least once per hour thereafter until the reactor is critical.
- d. Prior to initial operation above 5% RATED THERMAL POWER after each fuel loading, by consideration of the factors of e below, with the CEA groups at the Power Dependent Insertion Limits of Specification 3.1.3.6.

See Special Test Exception 3.10.1.

<sup>#</sup>With  $K_{eff} \ge 1.0$ . <sup>##</sup>With  $K_{eff} < 1.0$ . ST. LUCIE - UNIT 1

'3/4 1-1

REACTIVITY CONTROL SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

e. When in MODES 3 or 4, at least once per 24 yours by consideration of the following factors:

1. Reactor coolant system boron concentration,

2. CEA position,\*

3. Reactor coolant system average temperature,

4. Fuel burnup based on gross thermal energy generation,

5. Xenon concentration, and

6. Samarium concentration.

4.1.1.1.2 The overall core reactivity balance shall be compared to predicted values to demonstrate agreement within  $\pm$  1.0%  $\Delta k/k$  at least once per 31 Effective Full Power Days (EFPD). This comparison shall consider at least those factors stated in Specification 4.1.1.1.1.e, above. The predicted reactivity values shall be adjusted (normalized) to correspond to the actual core conditions prior to exceeding a fuel burnup of 60 Effective Full Power Days after each fuel loading.

\*For Modes 3 and 4, during calculation of shutdown margin vith all CEA's <u>verified</u> fully inserted, the single CEA with the highest reactivity worth need <u>not</u> be assumed to be stuck in the fully withdrawn position.

ST. LUCIE - UNIT 1

# TABLE 3.3-1 (Continued)

# REACTOR PROTECTIVE INSTRUMENTATION

- . <u>Func</u>	TIONAL UNIT	· TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION	
., 11.	Wide Range Logarithmic New Flux Monitor a. Startup and Operating Rate of Change of Pow			•			
	High	• 4	2(d)	- 3	1, 2 and *	2#	-
	b. Shutdown	4	0	2	3, 4, 5	- 3	
12.	Reactor Protection System Logic	4	2	4	1,2*	4	-
<u>.</u> 13.	Reactor Trip Breakers	4	2	4 <sup>*</sup>	1, 2*	4	•

3/4 3-3

4

ST. LUCIE - UNIT 1

# TABLE 3.3-1 (Continued)

# TABLE NOTATION

With the protective system trip breakers in the closed position and the CEA drive system capable of CEA withdrawal.

<sup>#</sup>The provisions of Specification 3.0.4 are not applicable.

- (a) Trip may be bypassed below 1% of RATED THERMAL POWER; bypass shall be automatically removed when THERMAL POWER is  $\geq$  1% of RATED THERMAL POWER.
- (b) Trip may be manually bypassed below 685 psig; bypass shall\_be: `, `automatically removed at or above 685 psig.
- (c) Trip may be bypassed below 15% of RATED THERMAL POWER; bypass shall be automatically removed when THERMAL POWER is  $\geq$  15% of RATED THERMAL POWER.
- (d) Trip may be bypassed below  $10^{-4}$ % and above 15% of RATED THERMAL POWER; bypass shall be automatically removed when THERMAL power is  $\geq 10^{-4}$ % or  $\leq 15$ % of RATED THERMAL POWER.
- (e) Trip may be bypassed during testing pursuant to Special Test Exception 3.10.3.
- (f) There shall be at least two decades of overlap between the Wide Range Logarithmic Neutron Flux Monitoring Channels and the Power Range Neutron Flux Monitoring Channels.

### ACTION STATEMENTS

ACTION 1

With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 6 hours and/or open the protective system trip breakers.

ACTION 2

- With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER 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.

ST. LUCIE - UNIT 1

		TABLE 3.3-	<u>3 (Continued)</u> .		-	•
	ENGINEERED SA	FETY FEATURE ACT	UATION SYSTEM	INSTRUMENTATION		
FU	NCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
5.	RECIRCULATION (RAS) a. Manual RAS (Trip '	·		•	·	•
	Buttons) b. Refueling Water Tank - Low	2.4	1 2	2	1, 2, 3, 4	. 8 9# -
, 6 <b>.</b>	LOSS OF POWER 4.16 kv Emergency Bus Undervoltage (Under- voltage relays)	1/Bus	- 1/Bus	1/Bus	1, 2, 3	9#
; 7. ;	AUXILIARY FEEDWATER AUTOMATIC START Steam Generator (SG) Level Instruments	4/SG	2/SG <sup>1/</sup>	2/SG	1, 2, 3	11

ST. LUCIE - UNIT

3/4 3-11

1/2/SG for either steam generator will start one train of AFW.

### 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
- 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.

With the number of OPERABLE channels one less than the

- 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 3.3-3 (Continued)

# TABLE NOTATION

ACTION 10 -

With the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed provided the inoperable channel is placed in the bypassed condition and the Minimum Channels OPERABLE requirement is demonstrated within 1 hour; one additional channel may be bypassed for up to 2 hours for surveillance testing per Sepcification 4.3.2.1.1.

ACTION 11 -

Instrument operability requirements are contained in the Reactor Protection System requirements for Reactor Trip on Steam Generator Level. If an Automatic Start channel is inoperable, operation may continue provided that the " affected pump is verified to be OPERABLE per Specification 4.7.1.2.a within 8 hours and at least once per 7 days thereafter; and the Automatic Start channel shall be restored to OPERABLE status within 30 days or the reactor shall be in at least HOT SHUTDOWN within the next 12 hours.

# TABLE 3.3-4

# ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

FU	ICTIONAL UNIT	TRIP SETPOINT		ALLOWABLE . VALUES
. 1.	SAFETY INJECTION (SIAS) a. Manual (Trip Buttons)	Not Applicable	1	Not Applicable
۰,	b. Containment Pressure - High	<u>&lt;</u> 5 psig		<u>&lt;</u> 5 psig
	c. Pressurizer Pressure - Low	<u>&gt;`1600 psia</u>		<u>&gt;</u> 1600 psia
2.	CONTAINMENT SPRAY (CSAS) aManual (Trip Buttons)	Not Applicable	•	Not Applicable <sub>.</sub>
	b. Containment Pressure High-High	<u>&lt;</u> 10 psig _ '	1	<u>&lt;</u> 10 psig
• 3.	CONTAINMENT ISOLATION (CIS) a. Manual (Trip Buttons)	Not Applicable		Not Applicable
	b. Containment Pressure - High	<u>&lt;</u> 5 psig		<u>&lt;</u> 5 psig
	c. Containment Radiation - High	<u>&lt;</u> 10 R/hr		<u>&lt;</u> 10 R/hr
	d. SIAS .	(See FUNCTION	AL UNIT	1 above)
4.	MAIN STEAM LINE ISOLATION (MSIS) a. Manual (Trip Buttons)	Not Applicable		Not Applicable
	b. Steam Generator Pressure - Low	<u>&gt;</u> 585 psig	•	<u>&gt;</u> 585 psig
5.	CONTAINMENT SUMP RECIRCULATION (RAS) a. Manual RAS (Trip Buttons)	Noț Applicable	  1	Not Applicable
	b. Refueling Water Tank - Low	48 inches above tank bottom	•	48 inches above tank bottom
			" <b>}</b>	

LUCIE - UNIT

ST

3/4 3-14

Aniendment No.  $\beta$ , 45

## 3/4.4 REACTOR COOLANT SYSTEM

REACTOR COOLANT LOOPS

LIMITING CONDITION FOR OPERATION

3.4.1 Four reactor coolant pumps shall be in operation.

APPLICABILITY: As noted below, but excluding MODE 6.

ACTION:

MODES 1 and 2:

With less than four reactor coolant pumps in operation, be in at least HOT STANDBY within 6 hours.

MODES 3, 4 and 5:

Operation may proceed provided (1) at least one reactor coolant loop is in operation with an associated reactor coolant pump or shutdown cooling pump and (2) the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is maintained at  $\geq 5.0\%$   $\Delta k/k$  during operation in MODE 3 when less than four reactor coolant pumps are in operation. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.4.1 The Flow Dependent Selector Switch shall be determined to be in the 4 pump position within 15 minutes prior to making the reactor critical and at least once per 12 hours thereafter.

All reactor coolant pumps and shutdown cooling pumps may be de-energized for up to 1 hour, provided no operations are permitted which could cause dilution of the reactor coolant system boron concentration.

ST. LUCIE - UNIT 1

#

REACTOR COOLANT. SYSTEM

SAFETY VALVES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.4.2 A minimum of one pressurizer code safety value shall be OPERABLE with a lift setting of 2500 PSIA  $\pm$  1%.

APPLICABILITY: MODES 4 and 5.

ACTION:

With no pressurizer code safety valve OPERABLE, immediately suspend all operations involving positive reactivity changes and place an OPERABLE shutdown cooling loop into operation.

SURVEILLANCE REQUIREMENTS

-4.4.2 The pressurizer code safety valve shall be demonstrated OPERABLE per Surveillance Reguirement 4.4.3.

3,	/4.1	REACTIVITY	CONTROL	SYSTEMS

BASES

3/4.1.1 BORATION CONTROL

### 3/4.1.1.1 and 3/4.1.1.2 SHUTDOWN MARGIN

A sufficient SHUTDOWN MARGIN ensures that 1) the reactor can be made subcritical from all operating conditions, 2) the reactivity transients associated with postulated accident conditions are controllable within acceptable limits, and 3) the reactor will be maintained sufficiently subcritical to preclude inadvertent criticality in the shutdown condition.

SHUTDOWN MARGIN requirements vary throughout core life as a function of fuel depletion, RCS boron concentration, and RCS  $T_{avg}$ . The most restrictive condition occurs at EOL, with  $T_{avg}$  at no load operating temperature, and is associated with a postulated steam line break accident and resulting uncontrolled RCS cooldown. In the analysis of this accident, a minimum SHUTDOWN MARGIN of 5.0%  $\Delta k/k$  is required to control the reactivity transient. Accordingly, the SHUTDOWN MARGIN required by Specification 3.1.1.1 is based upon this limiting condition and is consistent with FSAR accident analysis assumptions. For earlier periods during the fuel cycle, this value is conservative. With  $T_{avg} \leq 200^{\circ}$ F, the reactivity transients resulting from any postulated accident are minimal and a 1%  $\Delta k/k$  shutdown margin provides adequate protection.

#### 3/4.1.1.3 BORON DILUTION AND ADDITION

A minimum flow rate of at least 3000 GPM provides adequate mixing, prevents stratification and ensures that reactivity changes will be gradual during boron concentration changes in the Reactor Coolant System: A flow rate of at least 3000 GPM will circulate an equivalent Reactor Coolant System volume of 11,400 cubic feet in approximately 26 minutes. The reactivity change rate associated with boron concentration changes will be within the capability for operator recognition and control.

### 3/4.1.1.4 MODERATOR TEMPERATURE COEFFICIENT (MTC)

The limiting values assumed for the MTC used in the accident and transient analyses were + 0.5 x  $10^{-4} \Delta k/k/^{\circ}$ F for THERMAL POWER levels < 70% of RATED THERMAL POWER, + 0.2 x  $10^{-4} \Delta k/k/^{\circ}$ F for THERMAL POWER Tevels > 70% of RATED THERMAL and - 2.2 x  $10^{-4} \Delta k/k/^{\circ}$ F at RATED THERMAL POWER. Therefore, these limiting values are included in this specification. Determination of MTC at the specified conditions ensures that the maximum positive and/or negative values of the MTC will not exceed the limiting values.

ST. LUCIE - UNIT 1

Amendment No. 27, 45

REACTIVITY CONTROL SYSTEMS

BASES

### 3/4.1.1.5 MINIMUM TEMPERATURE FOR CRITICALITY

The MTC is expected to be slightly negative at operating conditions. However, at the beginning of the fuel cycle, the MTC may be slightly positive at operating conditions and since it will become more positive at lower temperatures, this specification is provided to restrict reactor operation when  $T_{\rm avg}$  is significantly below the normal operating temperature.

## 3/4.1.2 BORATION SYSTEMS

The boron injection system ensures that negative reactivity control is available during each mode of facility operation. The components required to perform this function include 1) borated water sources, 2) charging pumps, 3) separate flow paths, 4) boric acid pumps, 5) associated heat tracing systems, and 6) an emergency power supply from OPERABLE diesel generators.

With the RCS average temperature above 200°F, a minimum of two separate and redundant boron injection systems are provided to ensure single functional capability in the event an assumed failure renders one of the systems inoperable. Allowable out-of-service periods ensure that minor component repair or corrective action may be completed without undue risk to overall facility safety from injection system failures during the repair period.

The boration capability of either system is sufficient to provide a SHUTDOWN MARGIN from all operating conditions of 1.0%  $\Delta k/k$  after xeron decay and cooldown to 200°F. The maximum boration capability requirement occurs at EOL from full power equilibrium xenon conditions and requires 7,925 gallons of 8.0% boric acid solution from the boric acid tanks or 13,700 gallons of 1720 ppm borated water from the refueling water tank.

The requirements for a minimum contained volume of 401,800 gallons of borated water in the refueling water tank ensures the capability for borating the RCS to the desired level. The specified quantity of borated water is consistent with the ECCS requirements of Specification 3.5.4. Therefore, the larger volume of borated water is specified here too.

With the RCS temperature below 200°F, one injection system is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and positive reactivity change in the event the single injection system becomes inoperable.

ST. LUCIE - UNIT 1

Amendment No. 27, 28