May 25, 1993

Docket Nos. 50-498
and 50-499

Mr. William Cottle
Group Vice-President, Nuclear
Houston Lighting & Power Company
P. O. Box 1700
Houston, Texas 77251

Dear Mr. Cottle:

SUBJECT: ISSUANCE OF AMENDMENT NOS. 51 AND 40 TO FACILITY OPERATING LICENSE NOS. NPF-76 AND NPF-80 - SOUTH TEXAS PROJECT, UNITS 1 AND 2 (TAC NOS. M85717 AND M85718)

The Commission has issued the enclosed Amendment Nos. 51 and 40 to Facility Operating License Nos. NPF-76 and NPF-80 for the South Texas Project, Units 1 and 2. The amendments consist of changes to the Technical Specifications (TS) in response to your application dated January 14, 1993 (ST-HL-AE-4281).

The amendments change the Appendix A Technical Specifications by revising the Limiting Conditions for Operation of TS 3.2.1.5, 3.2.1.6, 3.5.5, and 3.9.1 to reflect changes in systems containing borated water for Unit 2. Changes for Unit 1 will be implemented during its fifth refueling outage presently scheduled for Spring 1994. You should reapply for the necessary final implementation amendments at least six months prior to the Unit 1 outage. Moreover, you should clearly state in your application any changes that may have been made in the intervening period which would affect the original application or the staff's safety evaluation.

A copy of our related Safety Evaluation supporting the amendment is also enclosed. Notice of Issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

Original Signed By

Lawrence E. Kokajko, Senior Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

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PDR ADOCK 05000498
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Enclosures:
1. Amendment No. 51 to NPF-76
2. Amendment No. 40 to NPF-80
3. Safety Evaluation

cc w/enclosures:
See next page

030002

*See Previous concurrences

Office	PDIV-2/LA	PDIV-2/PM	SRXB*	EMCB*	OGC*	PDIV-2/PD
Name	EPeyton	LKokjako:nb	RJones	JStrosnider	CPW	SBlack
Date	5/24/93	5/27/93	4/22/93	5/3/93	5/4/93	5/24/93
Copy	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

Document Name: b:\M85717.Amd

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

HOUSTON LIGHTING & POWER COMPANY

CITY PUBLIC SERVICE BOARD OF SAN ANTONIO

CENTRAL POWER AND LIGHT COMPANY

CITY OF AUSTIN, TEXAS

DOCKET NO. 50-498

SOUTH TEXAS PROJECT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 51
License No. NPF-76

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

   A. The application for amendment by Houston Lighting & Power Company* (HL&P) acting on behalf of itself and for the City Public Service Board of San Antonio (CPS), Central Power and Light Company (CPL), and City of Austin, Texas (COA) (the licensees) dated January 14, 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, as amended, 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 license 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.

*Houston Lighting & Power Company is authorized to act for the City Public Service Board of San Antonio, Central Power and Light Company and City of Austin, Texas and has exclusive responsibility and control over the physical construction, operation and maintenance of the facility.

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 Operating License No. NPF-76 is hereby amended to read as follows:

   2. Technical Specifications

      The Technical Specifications contained in Appendix A, as revised through Amendment No. 51, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. The license amendment is effective as of its date of issuance and to be implemented not later than the completion of the third refueling outage for Unit 2.

FOR THE NUCLEAR REGULATORY COMMISSION

Suzanne C. Black, Director
Project Directorate IV-2
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: May 25, 1993

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

HOUSTON LIGHTING & POWER COMPANY

CITY PUBLIC SERVICE BOARD OF SAN ANTONIO

CENTRAL POWER AND LIGHT COMPANY

CITY OF AUSTIN, TEXAS

DOCKET NO. 50-499

SOUTH TEXAS PROJECT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 40
License No. NPF-80

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

   A. The application for amendment by Houston Lighting & Power Company* (HL&P) acting on behalf of itself and for the City Public Service Board of San Antonio (CPS), Central Power and Light Company (CPL), and City of Austin, Texas (COA) (the licensees) dated January 14, 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, as amended, 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 license 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.

*Houston Lighting & Power Company is authorized to act for the City Public Service Board of San Antonio, Central Power and Light Company and City of Austin, Texas and has exclusive responsibility and control over the physical construction, operation and maintenance of the facility.

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 Operating License No. NPF-80 is hereby amended to read as follows:

   2. Technical Specifications

      The Technical Specifications contained in Appendix A, as revised through Amendment No. 40, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. The license amendment is effective as of its date of issuance and to be implemented not later than the completion of the third refueling outage for Unit 2.

FOR THE NUCLEAR REGULATORY COMMISSION

Suzanne C. Black, Director
Project Directorate IV-2
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: May 25, 1993

ATTACHMENT TO LICENSE AMENDMENT NOS. 51 AND 40

FACILITY OPERATING LICENSE NOS. NPF-76 AND NPF-80

DOCKET NOS. 50-498 AND 50-499

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

REMOVE	INSERT
3/4 1-13	3/4 1-13
3/4 1-14	3/4 1-14
3/4 5-1	3/4 5-1
3/4 5-10	3/4 5-10
3/4 9-1	3/4 9-1
B 3/4 1-2	B 3/4 1-2
B 3/4 1-3	B 3/4 1-3
B 3/4 9-1	B 3/4 9-1

BORATED WATER SOURCES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.5 As a minimum, one of the following borated water sources shall be OPERABLE:

a. A Boric Acid Storage System with:

1) A minimum contained borated water volume of 2900 gallons for Unit 1 and 3200 gallons for Unit 2,

2) A minimum boron concentration of 7000 ppm, and

3) A minimum solution temperature of 65°F.

b. The refueling water storage tank (RWST) with:

1) A minimum contained borated water volume of 122,000 gallons for MODE 5 and 33,000 gallons for MODE 6, and

2) A boron concentration between 2500 ppm and 2700 ppm for Unit 1 and between 2800 ppm and 3000 ppm for Unit 2.

APPLICABILITY: MODES 5 and 6.

ACTION:

With no borated water source OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes.

SURVEILLANCE REQUIREMENTS

4.1.2.5 The above required borated water source shall be demonstrated OPERABLE at least once per 7 days by:

a. Verifying the boron concentration of the water,

b. Verifying the contained borated water volume, and

c. Verifying the boric acid storage tank solution temperature when it is the source of borated water.

BORATED WATER SOURCES - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.6 As a minimum, the following borated water source(s) shall be OPERABLE as required by Specification 3.1.2.2 for MODES 1, 2, and 3 and one of the following borated water sources shall be OPERABLE as required by Specification 3.1.2.1 for MODE 4:

a. A Boric Acid Storage System with:

   1) A minimum contained borated water volume of 27,000 gallons,

   2) A minimum boron concentration of 7000 ppm, and

   3) A minimum solution temperature of 65°F.

b. The refueling water storage tank (RWST) with:

   1) A minimum contained borated water volume of 458,000 gallons, and

   2) A boron concentration between 2500 ppm and 2700 ppm for Unit 1 and between 2800 ppm and 3000 ppm for Unit 2.

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

ACTION:

a. With the Boric Acid Storage System inoperable and being used as one of the above required borated water sources, restore the system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and borated to a SHUTDOWN MARGIN equivalent to at least the limit as shown in Figure 3.1-2 at 200°F; restore the Boric Acid Storage System to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

b. With the RWST inoperable, restore the tank to OPERABLE status within 1 hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

3/4.5 EMERGENCY CORE COOLING SYSTEMS

3/4.5.1 ACCUMULATORS

LIMITING CONDITION FOR OPERATION

3.5.1 Each Safety Injection System accumulator shall be OPERABLE with:

a. The isolation valve open and power removed,

b. A contained borated water volume of between 8800 and 9100 gallons,

c. A boron concentration of between 2400 and 2700 ppm for Unit 1 and between 2700 ppm and 3000 ppm for Unit 2.

d. A nitrogen cover-pressure of between 590 and 670 psig.

APPLICABILITY: MODES 1, 2, and 3*.

ACTION:

a. With one accumulator inoperable, except as a result of a closed isolation valve or the boron concentration outside the required limits, restore the inoperable accumulator to OPERABLE status within 1 hour or be in at least HOT STANDBY within the next 6 hours and reduce pressurizer pressure to less than 1000 psig within the following 6 hours.

b. With one accumulator inoperable due to the isolation valve being closed, either open the isolation valve within 1 hour or be in at least HOT STANDBY within the next 6 hours and reduce pressurizer pressure to less than 1000 psig within the following 6 hours.

c. With the boron concentration of one accumulator outside the required limit, restore the boron concentration to within the required limits within 72 hours or be in at least HOT STANDBY within the next 6 hours and reduce pressurizer pressure to less than 1000 psig within the following 6 hours.

SURVEILLANCE REQUIREMENTS

*4.5.1.1 Each accumulator shall be demonstrated OPERABLE:

a. At least once per 24 hours by:

1) Verifying, by the absence of alarms, the contained borated water volume and nitrogen cover-pressure in the tanks, and

2) Verifying that each accumulator isolation valve is open.

b. At least once per 31 days and within 6 hours after each solution volume increase of greater than or equal to 1% of tank volume by verifying the boron concentration of the accumulator solution; and

*Pressurizer pressure above 1000 psig.

SURVEILLANCE REQUIREMENTS (Continued)

c. At least once per 31 days when the RCS pressure is above 1000 psig by verifying that power to the isolation valve operator is removed.

d. At least once per 18 months by verifying that each accumulator isolation valve opens automatically under each of the following conditions:

   1) When an actual or a simulated RCS pressure signal exceeds the P-11 (Pressurizer Pressure Block of Safety Injection) Setpoint, and

   2) Upon receipt of a Safety Injection test signal.

4.5.1.2 Each accumulator water level and pressure channel shall be demonstrated OPERABLE:

a. At least once per 31 days by the performance of an ANALOG CHANNEL OPERATIONAL TEST, and

b. At least once per 18 months by the performance of a CHANNEL CALIBRATION.

3/4.5.4 (This specification number is not used.)

3/4.5.5 REFUELING WATER STORAGE TANK

LIMITING CONDITION FOR OPERATION

3.5.5 The refueling water storage tank (RWST) shall be OPERABLE with:

a. A minimum contained borated water volume of 458,000 gallons, and

b. A boron concentration between 2500 ppm and 2700 ppm for Unit 1 and between 2800 ppm and 3000 ppm for Unit 2.

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

ACTION:

With the RWST inoperable, restore the tank to OPERABLE status within 1 hour or be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.5.5 The RWST shall be demonstrated OPERABLE at least once per 7 days by:

a. Verifying the contained borated water volume in the tank, and

b. Verifying the boron concentration of the water.

3/4.9 REFUELING OPERATIONS

3/4.9.1 BORON CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.9.1 The boron concentration of all filled portions of the Reactor Coolant System and the refueling canal shall be maintained uniform and sufficient to ensure that the more restrictive of the following reactivity conditions is met; either:

a. A K_{eff} of 0.95 or less, or

b. A boron concentration of greater than or equal to 2500 ppm for Unit 1 and 2800 ppm for Unit 2.

APPLICABILITY: MODE 6.*

ACTION:

With the requirements of the above specification not satisfied, immediately suspend all operations involving CORE ALTERATIONS or positive reactivity changes and initiate and continue boration at greater than or equal to 30 gpm of a solution containing greater than or equal to 7000 ppm boron or its equivalent until K_{eff} is reduced to less than or equal to 0.95 or the boron concentration is restored to greater than or equal to 2500 ppm for Unit 1 and 2800 ppm for Unit 2, whichever is the more restrictive.

SURVEILLANCE REQUIREMENTS

4.9.1.1 The more restrictive of the above two reactivity conditions shall be determined prior to:

a. Removing or unbolting the reactor vessel head, and

b. Withdrawal of any full-length control rod in excess of 3 feet from its fully inserted position within the reactor vessel.

4.9.1.2 The boron concentration of the Reactor Coolant System and the refueling canal shall be determined by chemical analysis at least once per 72 hours.

4.9.1.3 Valves FCV-110B, FCV-111B, CV0201A, and CV0221 shall be verified closed and secured in position by mechanical stops or by removal of air or electrical power at least once per 31 days.

*The reactor shall be maintained in MODE 6 whenever fuel is in the reactor vessel with the vessel head closure bolts less than fully tensioned or with the head removed.

3/4.9.2 INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.9.2 As a minimum, two Source Range Neutron Flux Monitors shall be OPERABLE, each with continuous visual indication in the control room and one with audible indication in the containment and control room.

APPLICABILITY: MODE 6.

ACTION:

a. With one of the above required monitors inoperable or not operating, immediately suspend all operations involving CORE ALTERATIONS or positive reactivity changes.

b. With both of the above required monitors inoperable or not operating, determine the boron concentration of the Reactor Coolant System at least once per 12 hours.

SURVEILLANCE REQUIREMENTS

4.9.2 Each Source Range Neutron Flux Monitor shall be demonstrated OPERABLE by performance of:

a. A CHANNEL CHECK at least once per 12 hours,

b. An ANALOG CHANNEL OPERATIONAL TEST within 8 hours prior to the initial start of CORE ALTERATIONS, and

c. An ANALOG CHANNEL OPERATIONAL TEST at least once per 7 days.

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}. In MODES 1 and 2, 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 1.75% $\Delta k/k$ is required to control the reactivity transient. The 1.75% $\Delta k/k$ SHUTDOWN MARGIN is the design basis minimum for the 14-foot fuel using silver-indium-cadmium and/or Hafnium control rods (Ref. FSAR Table 4.3-3). Accordingly, the SHUTDOWN MARGIN requirement for MODES 1 and 2 is based upon this limiting condition and is consistent with FSAR safety analysis assumptions. In MODES 3, 4, and 5, the most restrictive condition occurs at BOL, when the boron concentration is the greatest. In these modes, the required SHUTDOWN MARGIN is composed of a constant requirement and a variable requirement, which is a function of the RCS boron concentration. The constant SHUTDOWN MARGIN requirement of 1.75% $\Delta k/k$ is based on an uncontrolled RCS cooldown from a steamline break accident. The variable SHUTDOWN MARGIN requirement is based on the results of a boron dilution accident analysis, where the SHUTDOWN MARGIN is varied as a function of RCS boron concentration, to guarantee a minimum of 15 minutes for operator action after a boron dilution alarm, prior to a loss of all SHUTDOWN MARGIN.

The boron dilution analysis assumed a common RCS volume, and maximum dilution flow rate for MODES 3 and 4, and a different volume and flow rate for MODE 5. The MODE 5 conditions assumed limited mixing in the RCS and cooling with the RHR system only. In MODES 3 and 4 it was assumed that at least one reactor coolant pump was operating. If at least one reactor coolant pump is not operating in MODE 3 or 4, then the SHUTDOWN MARGIN requirements for MODE 5 shall apply.

3/4.1.1.3 MODERATOR TEMPERATURE COEFFICIENT

The limitations on moderator temperature coefficient (MTC) are provided to ensure that the value of this coefficient remains within the limiting condition assumed in the FSAR accident and transient analyses.

The MTC values of this specification are applicable to a specific set of plant conditions; accordingly, verification of MTC values at conditions other than those explicitly stated will require extrapolation to those conditions in order to permit an accurate comparison.

MODERATOR TEMPERATURE COEFFICIENT (Continued)

The most negative MTC value, equivalent to the most positive moderator density coefficient (MDC), was obtained by incrementally correcting the MDC used in the FSAR analysis to nominal operating conditions. These corrections involved: (1) a conversion of the MDC used in the FSAR analysis to its equivalent MTC, based on the rate of change of moderator density with temperature at RATED THERMAL POWER conditions, and (2) subtracting from this value the largest differences in MTC observed at EOL, all rods withdrawn, RATED THERMAL POWER conditions, and those most adverse conditions of moderator temperature and pressure, rod insertion, axial power skewing, and xenon concentration that can occur in nominal operation and lead to a significantly more negative EOL MTC at RATED THERMAL POWER. These corrections transformed the MDC values used in the FSAR analysis into the limiting EOL MTC value specified in the CORE OPERATING LIMITS REPORT (COLR). The 300 ppm surveillance MTC value specified in the COLR represents a conservative value (with corrections for burnup and soluble boron) at a core condition of 300 ppm equilibrium boron concentration, and is obtained by making these corrections to the limiting MTC value.

The Surveillance Requirements for measurement of the MTC at the beginning and near the end of the fuel cycle are adequate to confirm that the MTC remains within its limits since this coefficient changes slowly due principally to the reduction in RCS boron concentration associated with fuel burnup.

3/4.1.1.4 MINIMUM TEMPERATURE FOR CRITICALITY

This specification ensures that the reactor will not be made critical with the Reactor Coolant System average temperature less than 561°F. This limitation is required to ensure: (1) the moderator temperature coefficient is within its analyzed temperature range, (2) the trip instrumentation is within its normal operating range, (3) the pressurizer is capable of being in an OPERABLE status with a steam bubble, and (4) the reactor vessel is above its minimum RT_{NDT} 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 transfer pumps, and (5) an emergency power supply from OPERABLE diesel generators.

With the RCS average temperature above 350°F, a minimum of two boron injection flow paths are required to ensure single functional capability in the event an assumed failure renders one of the flow paths inoperable. The boration capability of either flow path is sufficient to provide a SHUTDOWN MARGIN from expected operating conditions of 1.75% Δk/k after xenon decay and cooldown to 200°F. The maximum expected boration capability requires 27,000 gallons of 7000 ppm borated water from the boric acid storage system or 458,000 gallons of 2500 ppm borated water for Unit 1 (2800 ppm for Unit 2) from the refueling water storage tank (RWST). The RWST volume is an ECCS requirement and is more than adequate for the required boration capability.

BORATION SYSTEMS (Continued)

With the RCS temperature below 350°F, one boron injection flow path/source 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 changes in the event the single boron injection flow path/source becomes inoperable.

The limitation for a maximum of one charging pump to be OPERABLE and the Surveillance Requirement to verify all charging pumps except the required OPERABLE pump to be inoperable below 350°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

The boration capability required below 200°F is sufficient to provide a variable SHUTDOWN MARGIN based on the results of a boron dilution accident analysis where the SHUTDOWN MARGIN is varied as a function of RCS boron concentration after xenon decay and cooldown from 200°F to 140°F. This condition requires either 2900 gallons for Unit 1 (3200 gallons for Unit 2) of 7000 ppm borated water from the boric acid storage system or 122,000 gallons of 2500 ppm borated water for Unit 1 (2800 ppm for Unit 2) from the RWST for MODE 5 and 33,000 gallons of 2500 ppm borated water for Unit 1 (2800 ppm for Unit 2) from the RWST for MODE 6.

The contained water volume limits include allowance for water not available because of discharge line location and other physical characteristics.

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 7.5 and 10.0 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components.

The OPERABILITY of one Boron Injection System during REFUELING ensures that this system is available for reactivity control while in MODE 6.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

The specifications of this section ensure that: (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) the potential effects of rod misalignment on associated accident analyses are limited. OPERABILITY of the control rod position indicators is required to determine control rod positions and thereby ensure compliance with the control rod alignment and insertion limits. Verification that the Digital Rod Position Indicator agrees with the demanded position within ± 12 steps at 24, 48, 120, and 259 steps withdrawn for the Control Banks and 18, 234, and 259 steps withdrawn for the Shutdown Banks provides assurances that the Digital Rod Position Indicator is operating correctly over the full range of indication. Since the Digital Rod Position Indication System does not indicate the actual shutdown rod position between 18 steps and 234 steps, only points in the indicated ranges are picked for verification of agreement with demanded position.

BASES

MOVABLE CONTROL ASSEMBLIES (Continued)

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original design criteria are met. Misalignment of a rod requires measurement of peaking factors and a restriction in THERMAL POWER. These restrictions provide assurance of fuel rod integrity during continued operation. In addition, those safety analyses affected by a misaligned rod are reevaluated to confirm that the results remain valid during future operation.

The maximum rod drop time restriction is consistent with the assumed rod drop time used in the safety analyses. Measurement with T_{avg} greater than or equal to 561°F and with all reactor coolant pumps operating ensures that the measured drop times will be representative of insertion times experienced during a Reactor trip at operating conditions.

Control rod positions and OPERABILITY of the rod position indicators are required to be verified on a nominal basis of once per 12 hours with more frequent verifications required if an automatic monitoring channel is inoperable. These verification frequencies are adequate for assuring that the applicable LCOs are satisfied.

3/4.9 REFUELING OPERATIONS

BASES

3/4.9.1 BORON CONCENTRATION

The limitations on reactivity conditions during REFUELING ensure that: (1) the reactor will remain subcritical during CORE ALTERATIONS, and (2) a uniform boron concentration is maintained for reactivity control in the water volume having direct access to the reactor vessel. These limitations are consistent with the initial conditions assumed for the boron dilution incident in the safety analyses. The value of 0.95 or less for K_{eff} includes a 1% $\Delta k/k$ conservative allowance for uncertainties. Similarly, the boron concentration value of 2500 ppm or greater for Unit 1 (2800 ppm or greater for Unit 2) includes a conservative uncertainty allowance of 50 ppm boron. The locking closed of the required valves during refueling operations precludes the possibility of uncontrolled boron dilution of the filled portion of the RCS. This action prevents flow to the RCS of unborated water by closing flow paths from sources of unborated water.

3/4.9.2 INSTRUMENTATION

The OPERABILITY of the Source Range Neutron Flux Monitors ensures that redundant monitoring capability is available to detect changes in the reactivity condition of the core.

3/4.9.3 DECAY TIME

The minimum requirement for reactor subcriticality prior to movement of irradiated fuel assemblies in the reactor vessel ensures that sufficient time has elapsed to allow the radioactive decay of the short-lived fission products. This decay time is consistent with the assumptions used in the safety analyses for the rapid refueling design.

3/4.9.4 CONTAINMENT BUILDING PENETRATIONS

The requirements on containment building penetration closure and OPERABILITY ensure that a release of radioactive material within containment will be restricted from leakage to the environment. The OPERABILITY and closure restrictions are sufficient to restrict radioactive material release from a fuel element rupture based upon the lack of containment pressurization potential while in the REFUELING MODE.

3/4.9.5 COMMUNICATIONS

The requirement for communications capability ensures that refueling station personnel can be promptly informed of significant changes in the facility status or core reactivity conditions during CORE ALTERATIONS.

BASES

3/4.9.6 REFUELING MACHINE

The OPERABILITY requirements for the refueling machine and auxiliary hoist ensure that: (1) the refueling machine and auxiliary hoist will be used for movement of drive rods and fuel assemblies, (2) the refueling machine has sufficient load capacity to lift a drive rod or fuel assembly, and (3) the core internals and reactor vessel are protected from excessive lifting force in the event they are inadvertently engaged during lifting operations.

3/4.9.7 CRANE TRAVEL - FUEL HANDLING BUILDING

The restriction on movement of loads in excess of the nominal weight of a fuel and control rod assembly and associated handling tool over other fuel assemblies in the storage pool, unless handled by the single-failure-proof main hoist of the FHB 15-ton crane, ensures that in the event this load is dropped: (1) the activity release will be limited to that contained in a single fuel assembly, and (2) any possible distortion of fuel in the storage racks will not result in a critical array. This assumption is consistent with the activity release assumed in the safety analyses.

3/4.9.8 RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION

The requirement that at least one residual heat removal (RHR) loop be in operation ensures that: (1) sufficient cooling capacity is available to remove decay heat and maintain the water in the reactor vessel below 140°F as required during the REFUELING MODE, and (2) sufficient coolant circulation is maintained through the core to minimize the effect of a boron dilution incident and prevent boron stratification.

The requirement to have two RHR loops OPERABLE when there is less than 23 feet of water above the reactor vessel flange ensures that a single failure of the operating RHR loop will not result in a complete loss of residual heat removal capability. With the reactor vessel head removed and at least 23 feet of water above the reactor pressure vessel flange, a large heat sink is available for core cooling. Thus, in the event of a failure of the operating RHR loop, adequate time is provided to initiate emergency procedures to cool the core.

3/4.9.9 CONTAINMENT VENTILATION ISOLATION SYSTEM

The OPERABILITY of this system ensures that the containment purge and exhaust penetrations will be automatically isolated upon detection of high radiation levels in the purge exhaust. The OPERABILITY of this system is required to restrict the release of radioactive material from the containment atmosphere to the environment.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 51 AND 40 TO

FACILITY OPERATING LICENSE NOS. NPF-76 AND NPF-80

HOUSTON LIGHTING & POWER COMPANY

CITY PUBLIC SERVICE BOARD OF SAN ANTONIO

CENTRAL POWER AND LIGHT COMPANY

CITY OF AUSTIN, TEXAS

DOCKET NOS. 50-498 AND 50-499

SOUTH TEXAS PROJECT, UNITS 1 AND 2

1.0 INTRODUCTION

By application dated January 14, 1993, Houston Lighting & Power Company, et. al., (the licensee) requested changes to the Technical Specifications (Appendix A to Facility Operating License No. NPF-76 and NPF-80) for South Texas Project, Units 1 and 2. The proposed changes would revise Technical Specification (TS) Section 3.1 (Reactivity Control Systems), Section 3.5 (Emergency Core Cooling Systems), and Section 3.9 (Refueling Operations). These sections would be revised to allow an increased boron concentration in the refueling water storage tank (RWST) and related changes. The licensee requested this change to support the use of more reactive core loads in order to achieve longer fuel cycle lengths. This evaluation only addresses changes in boron concentration and boric acid storage volume requirements; it does not address the use of more reactive cores.

The licensee proposed the following specific changes: (1) revise the minimum required soluble boron concentration in the reactor coolant system and refueling canal during refueling (Mode 6) from 2500 ppm (parts per million) to 2800 ppm (TS Section 3.9.1); (2) revise the soluble boron concentration range required in the RWST from 2500 to 2700 ppm to a range of 2800 to 3000 ppm (TS Sections 3.1.2.5, 3.1.2.6, and 3.5.5); (3) revise the soluble boron concentration range required in the safety injection (SI) accumulators from 2400 to 2700 ppm to a range of 2700 to 3000 ppm (TS Section 3.5.1); (4) revise the required minimum contained water volume in the boric acid storage system during refueling from 2900 gallons to 3200 gallons (TS Section 3.1.2.5).

2.0 EVALUATION

The licensee presented the results of an evaluation of the impact of the proposed changes on the reactor containment building analyses presented in Chapter 6 and the transient analyses presented in Chapter 15 of the South

Texas Project Updated Final Safety Analysis Report (UFSAR). The evaluation was conducted by the Westinghouse Electric Corporation. The proposed change did not adversely affect the Chapter 6 analyses. The only impact of the proposed changes on the Chapter 15 analyses is a revision of the post loss-of-coolant accident (LOCA) time to switchover to hot leg recirculation to prevent boron precipitation in the reactor vessel.

LOCA Analyses

The licensee stated that no credit is taken for boron concentration in the core for the analysis of the performance of the emergency core cooling system (ECCS) for large or small breaks. Therefore, the LOCA analyses contained in the UFSAR are not affected by the proposed changes. The NRC staff has reviewed the licensee's determination of the effects of the proposed changes on the UFSAR LOCA analyses and concludes that the proposed changes do not affect these analyses.

Post-LOCA Analyses

Since the large break LOCA analysis does not take credit for insertion of the control rods (initial reactor subcriticality during a large break LOCA is provided by void formation in the core), long-term reactor sub-criticality must be maintained by borated water alone. The water provided by the RWST and accumulators must contain enough boron, when combined with other borated and non-borated water sources in the reactor building sump, to maintain the reactor subcritical during the long-term recirculation phase of a LOCA.

The licensee stated that increasing the boron concentration in the RWST and accumulators would tend to make the reactor more subcritical, so the current analysis is conservative with respect to the proposed changes. The licensee stated that this conclusion is confirmed with each refueling via the normal reload evaluation process. The staff has reviewed the proposed changes and concludes that sufficient boron will be available in the containment sump water following a LOCA to ensure that the core will remain subcritical.

After a LOCA, boric acid solution injected by the ECCS will concentrate in the core region due to water boil-off. Continued concentration buildup would cause boric acid to precipitate in the core region, which could potentially have an adverse effect on the ability to cool the core. In order to prevent boric acid precipitation, core cooling should be switched from cold leg to hot leg recirculation at some time after the initiation of the LOCA. The switchover time is dependent on the concentration of boric acid in the safety injection water. The licensee evaluated the increase in boron concentration with respect to the potential for boric acid precipitation in the core. The analysis resulted in a reduction in the switchover time from 13.6 hours to 10.5 hours. The staff has reviewed the proposed change and finds the modified hot leg switchover time acceptable.

The increase in boric acid concentration in the RWST and the safety injection (SI) accumulators affects the pH values of the containment spray and containment sump water. The licensee analyzed the effect of the proposed changes on the sump solution pH and determined that it remains within the acceptable range of 7.0 to 9.5. The licensee stated that this remains within the range used in the analysis of containment spray iodine removal effectiveness. The staff has reviewed the information provided by the licensee regarding the effect of the proposed changes on sump pH and finds it acceptable.

Non-LOCA Analyses

The licensee stated that the minimum RWST and SI accumulator boron concentrations currently in the technical specifications are assumed in the UFSAR analyses for secondary system failures resulting in the addition of significant positive reactivity (e.g., steamline breaks and inadvertent opening of a steam generator relief or safety valve). Boron is used to mitigate these reactivity excursions; therefore, the higher boron concentration provided by the proposed changes improves the results of the analyses for these transients. The staff has reviewed the licensee's determination of the effects of the proposed changes on the UFSAR non-LOCA analyses and concludes that the proposed changes are acceptable.

Boric Acid Solubility Analysis

The proposed change will increase the boric acid concentration in the RWST, SI accumulators, and associated piping. This increase in concentration will increase the minimum temperature at which the boric acid will precipitate. The licensee has verified that for a solution of 3000 ppm boron, the precipitation temperature is below that to which the fluid systems affected are ever expected to be exposed. The staff has reviewed the licensee's determination of the effects of the proposed changes on the solubility of boron in the affected fluid systems and concludes that the proposed changes are acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Texas State official was notified of the proposed issuance of the amendment. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The 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 the amendment involves no significant hazards consideration, and there has been no public comment on such finding (58 FR 16226). Accordingly, the 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 the amendment.

5.0 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.

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Date: May 25, 1993