January 8, 1987

Docket No.: 50-382

Mr. J. G. Dewease
Senior Vice President - Nuclear Operations
Louisiana Power and Light Company
317 Baronne Street, Mail Unit 17
New Orleans, Louisiana 70160

Dear Mr. Dewease:

Subject: Issuance of Amendment No. 10 to Facility Operating License No. NPF-38 for Waterford 3

The Commission has issued the enclosed Amendment No. 10 to Facility Operating License No. NPF-38 for the Waterford Steam Electric Station, Unit 3. The amendment consists of changes to the Technical Specifications in response to your applications transmitted by letter dated August 20, 1986, as supplemented by two letters dated October 6, 1986.

The amendment revises the Appendix A Technical Specifications to reflect changes in the requirements for the boric acid makeup (BAMU) system, i.e., removal of the requirement for a heat tracing circuit and reduction of the boron concentration requirements for the BAMU system.

A copy of the Safety Evaluation supporting the amendment is also enclosed.

Sincerely,

/S/

James H. Wilson, Project Manager
PWR Project Directorate No. 7
Division of PWR Licensing-B

Enclosures:
1. Amendment No. 10 to NPF-38
2. Safety Evaluation

cc: See next page

PD7	PD7	OGC	DIR:PD7
JWilson/yt	JLee	Sturk	GWKnighton
12/23/86	12/29/86	12/31/86	1/7/87

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ISSUANCE OF AMENDMENT NO. 10 TO FACILITY OPERATING
LICENSE NP. NPF-38 FOR WATERFORD 3

DISTRIBUTION
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NRC PDR
Local PDR
PBD7 Reading
FMiraglia
JLee (5)
JWilson
Attorney, OGC - Bethesda
LHarmon
EJordan
BGrimes
JPartlow
TBarnhart (4)
WJones
WRegan
ACRS (10)
OPA
RDiggs, LFMB
DCrutchfield
CThomas
SSun
RJones
WRegan

cc:
W. Malcolm Stevenson, Esq.
Monroe & Leman
1432 Whitney Building
New Orleans, Louisiana 70103

Mr. E. Blake
Shaw, Pittman, Potts and Trowbridge
2300 N Street, NW
Washington, D.C. 20037

Mr. Gary L. Groesch
P. O. Box 791169
New Orleans, Louisiana 70179-1169

Mr. F. J. Drummond
Project Manager - Nuclear
Louisiana Power and Light Company
317 Baronne Street
New Orleans, Louisiana 70160

Mr. K. W. Cook
Nuclear Support and Licensing Manager
Louisiana Power and Light Company
317 Baronne Street
New Orleans, Louisiana 70160

Resident Inspector/Waterford NPS
P. O. Box 822
Killona, Louisiana 70066

Mr. Ralph T. Lally
Manager of Quality Assurance
Middle South Services, Inc.
P. O. Box 61000
New Orleans, Louisiana 70161

Chairman
Louisiana Public Service Commission
One American Place, Suite 1630
Baton Rouge, Louisiana 70825-1697

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
Office of Executive Director
for Operations
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

Carole H. Burstein, Esq.
445 Walnut Street
New Orleans, Louisiana 70118

Mr. Charles B. Brinkman, Manager
Washington Nuclear Operations
Combustion Engineering, Inc.
7910 Woodmont Avenue, Suite 1310
Bethesda, Maryland 20814

Mr. William H. Spell, Administrator
Nuclear Energy Division
Office of Environmental Affairs
P. O. Box 14690
Baton Rouge, Louisiana 70898

President, Police Jury
St. Charles Parrish
Hahnville, Louisiana 70057

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

LOUISIANA POWER AND LIGHT COMPANY

DOCKET NO. 50-382

WATERFORD STEAM ELECTRIC STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 10
License No. NPF-38

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

   A. The application for amendment, dated August 20, 1986, as supplemented by two letters dated October 6, 1986, by Louisiana Power and Light Company (licensee), complies with standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's 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 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;

   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 Operating License No. NPF-38 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 10, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in this license. LP&L shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

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

FOR THE NUCLEAR REGULATORY COMMISSION

James H. Wilson

James H. Wilson, Project Manager
PWR Project Directorate No. 7
Division of PWR Licensing-B

Attachment:
Changes to the Technical
Specifications

Date of Issuance: January 8, 1987

ATTACHMENT TO LICENSE AMENDMENT NO. 10

TO FACILITY OPERATING LICENSE NO. NPF-38

DOCKET NO. 50-382

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. Also to be replaced are the following overleaf pages to the amended pages.

Amendment Pages	Overleaf Pages
XIX	XX
3/4 1-6	3/4 1-5
3/4 1-7	3/4 1-8
3/4 1-12	3/4 1-11
3/4 1-13	-
3/4 1-14	-
B 3/4 1-2	B 3/4 1-1

LIST OF FIGURES

LIST OF TABLES

MINIMUM TEMPERATURE FOR CRITICALITY

LIMITING CONDITION FOR OPERATION

3.1.1.4 The Reactor Coolant System lowest operating loop temperature (T_{cold}) shall be greater than or equal to 520°F.

APPLICABILITY: MODES 1 and 2#.

ACTION:

With a Reactor Coolant System operating loop temperature (T_{cold}) less than 520°F, restore T_{cold} to within its limit within 15 minutes or be in HOT STANDBY within the next 15 minutes.

SURVEILLANCE REQUIREMENTS

4.1.1.4 The Reactor Coolant System cold leg temperature (T_{cold}) shall be determined to be greater than or equal to 520°F:

a. Within 15 minutes prior to achieving reactor criticality, and

b. At least once per 30 minutes when the reactor is critical and the Reactor Coolant System T_{cold} is less than 530°F.

#With K_{eff} greater than or equal to 1.0.

3/4.1.2 BORATION SYSTEMS

FLOW PATHS - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.1 As a minimum, one of the following boron injection flow paths shall be OPERABLE and capable of being powered from an OPERABLE emergency power source:

a. A flow path from the boric acid makeup tank via either a boric acid makeup pump or a gravity feed connection and any charging pump to the Reactor Coolant System if the boric acid makeup tank in Specification 3.1.2.7a. is OPERABLE, or

b. The flow path from the refueling water storage pool via either a charging pump or a high pressure safety injection pump to the Reactor Coolant System if the refueling water storage pool in Specification 3.1.2.7b. is OPERABLE.

APPLICABILITY: MODES 5 and 6.

ACTION:

With none of the above flow paths OPERABLE or capable of being powered from an OPERABLE emergency power source, suspend all operations involving CORE ALTERATIONS or positive reactivity changes.

SURVEILLANCE REQUIREMENTS

4.1.2.1 At least one of the above required flow paths shall be demonstrated OPERABLE:

a. At least once per 24 hours when the Reactor Auxiliary Building air temperature is less than 55°F by verifying the Boric Acid Makeup Tank solution is greater than 55°F (when the flow path from the boric acid makeup tank is used).

b. At least once per 31 days by verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

FLOW PATHS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.2 At least two boron injection flow paths to the RCS via the charging pumps shall be OPERABLE. The following flow paths may be used:

a. With the contents of either boric acid makeup tank in accordance with Figure 3.1-1, the following flow paths shall be OPERABLE:
   1. One flow path from an acceptable boric acid makeup tank via its boric acid makeup pump; and
   2. One flow path from an acceptable boric acid makeup tank via its gravity feed valve; or

b. With the combined contents of both boric acid makeup tanks in accordance with Figure 3.1-1, both of the following flow paths shall be OPERABLE:
   1. One flow path consisting of both boric acid makeup pumps, and
   2. One flow path consisting of both gravity feed valves.

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

ACTION:

With only one of the above required boron injection flow paths to the Reactor Coolant System OPERABLE, restore at least two boron injection flow paths to the Reactor Coolant System to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to the requirements of Specification 3.1.1.1 or 3.1.1.2, whichever is applicable, within the next 6 hours; restore at least two flow paths to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.2 At least two of the above required flow paths shall be demonstrated OPERABLE:

a. At least once per 24 hours when the Reactor Auxiliary Building temperature is below 55°F by verifying that the temperature of the boric acid makeup tank(s) is above 55°F.

b. At least once per 31 days by verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

c. At least once per 18 months during shutdown by verifying that each automatic valve in the flow path actuates to its correct position on an SIAS test signal.

d. At least once per 18 months by verifying that the flow path required by Specification 3.1.2.2a.1 and 3.1.2.2a.2 delivers at least 40 gpm to the Reactor Coolant System.

CHARGING PUMPS - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.3 At least one charging pump or one high pressure safety injection pump in the boron injection flow path required OPERABLE pursuant to Specification 3.1.2.1 shall be OPERABLE and capable of being powered from an OPERABLE emergency power source.

APPLICABILITY: MODES 5 and 6.

ACTION:

With no charging pump or high pressure safety injection pump OPERABLE or capable of being powered from an OPERABLE emergency power source, suspend all operations involving CORE ALTERATIONS or positive reactivity changes.

SURVEILLANCE REQUIREMENTS

4.1.2.3 No additional Surveillance Requirements other than those required by Specification 4.0.5.

BORIC ACID MAKEUP PUMPS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.6 At least the boric acid makeup pump(s) in the boron injection flow path(s) required OPERABLE pursuant to Specification 3.1.2.2a. shall be OPERABLE and capable of being powered from an OPERABLE emergency bus if the flow path through the boric acid pump(s) in Specification 3.1.2.2a. is OPERABLE.

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

ACTION:

With one boric acid makeup pump required for the boron injection flow path(s) pursuant to Specification 3.1.2.2a. inoperable, restore the boric acid makeup pump 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 2% delta k/k at 200°F; restore the above required boric acid makeup pump(s) to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.6 Each required boric acid makeup pump shall be demonstrated OPERABLE at least once every 18 months by verifying that each boric acid makeup pump starts in response to an SIAS test signal.

BORATED WATER SOURCES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

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

a. One boric acid makeup tank with a boron concentration between 2.25 and 3.50 weight percent and a minimum borated water volume of 4150 gallons (36% indicated level).

b. The refueling water storage pool (RWSP) with:

1. A minimum contained borated water volume of 65,465 gallons (12% indicated level), and

2. A minimum boron concentration of 1720 ppm.

APPLICABILITY: MODES 5 and 6.

ACTION:

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

SURVEILLANCE REQUIREMENTS

4.1.2.7 The above required borated water source shall be demonstrated OPERABLE:

a. At least once per 24 hours when the Reactor Auxiliary Building air temperature is less than 55°F by verifying the boric acid makeup tank solution is greater than 55°F (when it is the source of borated water).

b. At least once per 7 days by:

1. Verifying the boron concentration of the water, and

2. Verifying the contained borated water volume of the tank.

REQUIRED STORED BORIC ACID VOLUME AS A FUNCTION OF CONCENTRATION

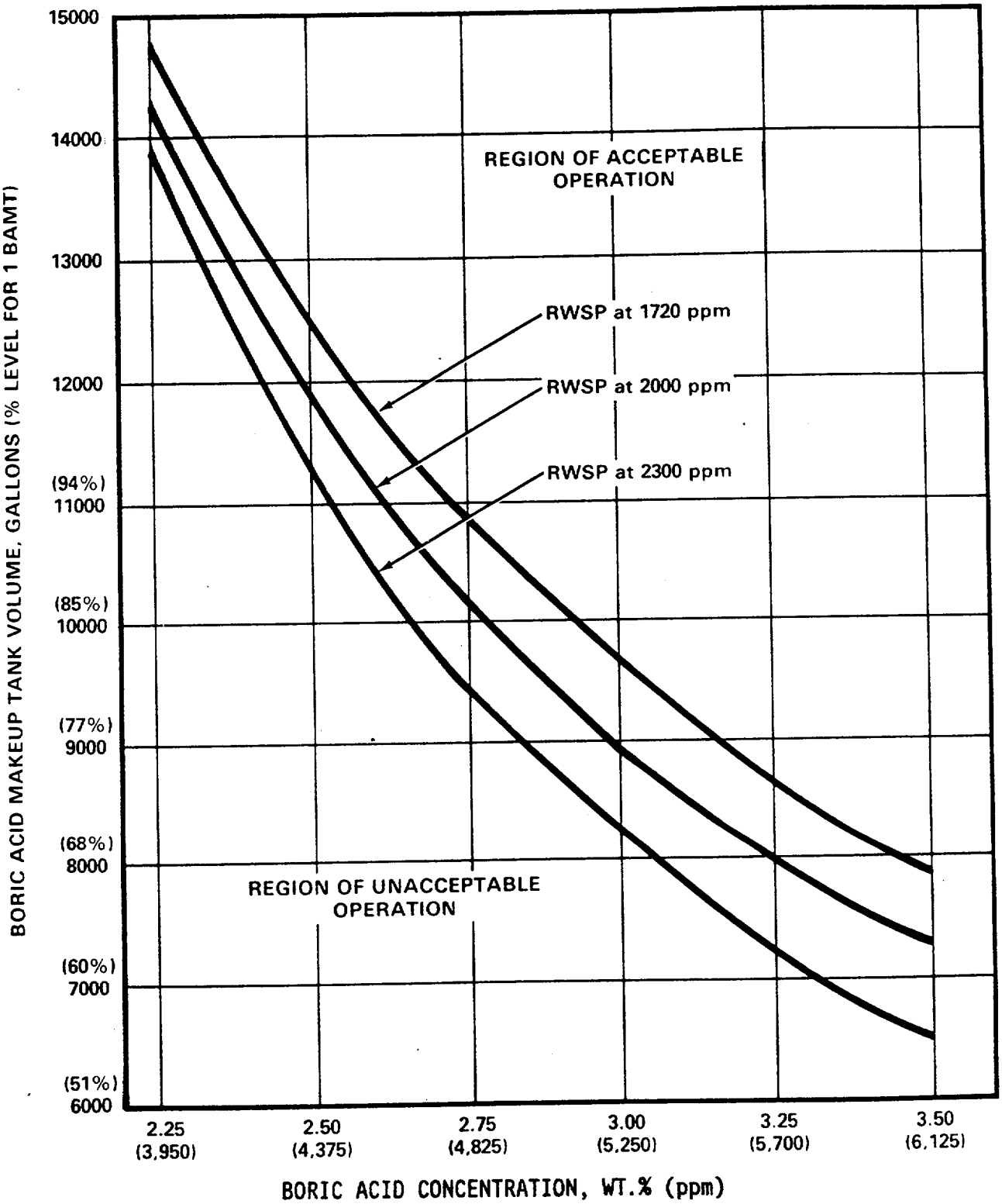

FIGURE 3.1-1

BORATED WATER SOURCES - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.8 Each of the following borated water sources shall be OPERABLE:

a. At least one of the following sources:

1) One boric acid makeup tank, with the tank contents in accordance with Figure 3.1-1, or

2) Two boric acid makeup tanks, with the combined contents of the tanks in accordance with Figure 3.1-1, and

b. The refueling water storage pool with:

1. A minimum contained borated water volume of 475,500 gallons (82% of indicated level), and

2. A boron concentration of between 1720 and 2300 ppm of boron, and

3. A solution temperature between 55°F and 100°F.

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

ACTION:

a. With the above required boric acid makeup tank(s) inoperable, restore the tank(s) 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 the requirements of Specification 3.1.1.1 or 3.1.1.2, whichever is applicable; restore the above required boric acid makeup tank(s) to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

b. With the refueling water storage pool inoperable, restore the pool 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.

SURVEILLANCE REQUIREMENTS

4.1.2.8 Each borated water source shall be demonstrated OPERABLE:

a. At least once per 24 hours by verifying the RWSP temperature when the Reactor Auxiliary Building air temperature is less than 55°F or greater than 100°F.

b. At least once per 24 hours by verifying the BAMT temperature is above 55°F when the Reactor Auxiliary Building air temperature is less than 55°F.

c. At least once per 7 days by:

1. Verifying the boron concentration in the water, and

2. Verifying the contained borated water volume of the water source.

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 5.15% delta k/k is required to control the reactivity transient. Accordingly, the SHUTDOWN MARGIN requirement is based upon this limiting condition and is consistent with FSAR safety analysis assumptions. With T_{avg} less than or equal to 200°F, the reactivity transients resulting from any postulated accident are minimal and a 2% delta k/k SHUTDOWN MARGIN provides adequate protection.

3/4.1.1.3 MODERATOR TEMPERATURE COEFFICIENT

The limitations on moderator temperature coefficient (MTC) are provided to ensure that the assumptions used in the accident and transient analysis remain valid through each fuel cycle. The Surveillance Requirements for measurement of the MTC during each fuel cycle are adequate to confirm the MTC value since this coefficient changes slowly due principally to the reduction in RCS boron concentration associated with fuel burnup. The confirmation that the measured MTC value is within its limit provides assurances that the coefficient will be maintained within acceptable values throughout each fuel cycle.

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 cold leg temperature less than 520°F. This limitation is required to ensure (1) the moderator temperature coefficient is within its analyzed temperature range, (2) the protective instrumentation is within its normal operating range, (3) the pressurizer is capable of being in an OPERABLE status with a steam bubble, (4) the reactor pressure vessel is above its minimum RT_{NDT} temperature, and (5) the ECCS analysis remains valid for the peak linear heat rate of Specification 3.2.1.

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 makeup 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 expected operating conditions of 2.0% delta k/k after xenon decay and cooldown to 200°F. The maximum expected boration capability requirement occurs at EOL from full power equilibrium xenon conditions assuming the most reactive CEA stuck out of the core and requires boric acid solution from the boric acid makeup tanks in the allowable concentrations and volumes of Specification 3.1.2.8 plus approximately 19,000 gallons of 1720 ppm borated water from the refueling water storage pool or approximately 58,000 gallons of 1720 ppm borated water from the refueling water storage pool alone. The higher limit of 447,100 gallons is specified to be consistent with Specification 3.5.4 in order to meet the ECCS requirements.

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 changes in the event the single injection system becomes inoperable.

The boron capability required below 200°F is based upon providing a 2% delta k/k SHUTDOWN MARGIN after xenon decay and cooldown from 200°F to 140°F. This condition requires either 5,465 gallons of 1720 ppm borated water from the refueling water storage pool or boric acid solution from the boric acid makeup tanks in accordance with the requirements of Specification 3.1.2.7.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 10 TO FACILITY OPERATING LICENSE NO. NPF-38

LOUISIANA POWER AND LIGHT COMPANY

WATERFORD STEAM ELECTRIC STATION, UNIT 3

DOCKET NO. 50-382

1.0 INTRODUCTION

By letter dated August 20, 1986, as supplemented by two letters dated October 6, 1986, Louisiana Power and Light Company (the licensee) requested changes to the Technical Specifications (Appendix A to Facility Operating License No. NPF-38) for the Waterford Steam Electric Station, Unit 3. The proposed changes would revise the requirements for the boric acid makeup (BAMU) system, i.e., removal of the requirement for a heat tracing circuit and reduction of the boron concentration requirements for the BAMU system.

2.0 DISCUSSION

The proposed changes would modify the requirements for the boric acid makeup (BAMU) system which is used to provide an adequate volume of borated water into the reactor coolant system (RCS) to assure that the shutdown margin meets the requirements of Technical Specifications 3.1.1.1 and 3.1.1.2. The existing plant design requires the heat tracing circuit for the BAMU system to be operable in order to maintain the temperature of fluid in the BAMU system high enough to prevent the boric acid from precipitating at ambient temperatures and thus assure the BAMU system functions properly. In order to increase plant operational flexibility, the licensee proposes to delete the requirement of heat tracing for the BAMU system. At the same time, the licensee proposes: (1) to reduce the boron concentration requirements for the BAMU system from a range of 7.5 to 12.0 weight percent to 2.25 to 3.5 weight percent boric acid to avoid boron precipitation at ambient temperatures with removal of the heat tracing requirement; and (2) to increase the upper range of the required borated water volume for the BAMU system from 5,850 to 14,800 gallons to assure the existing requirements for the shutdown margin specified in Technical Specifications 3.1.1.1 and 3.1.1.2 are met with the proposed requirement for lower boron concentration. In addition, the licensee submitted the analytical results in a Reload Analyses Report (RAR) to support the request for the proposed changes, and provided the revised Technical Specifications 3/4.1.2.1, 3/4.1.2.2, 3/4.1.2.7, 3/4.1.2.8 and Bases 3/4.1.2 for review and approval.

3.0 EVALUATION

The proposed changes of requirements for the BAMU system, the associated Technical Specification changes and the calculational results in the RAR supporting the request for the changes, have been evaluated below.

3.1 Boration Capacity

The methodology and analytical results to support the request for the Technical Specification changes are documented in the RAR and include two distinct series of calculations for the required and available boron concentrations in the RCS to maintain a safe shutdown margin. Both are employed at each time of interest in the plant cooldown conditions.

3.1.1 Evaluation of Analysis for Required Boron Concentration

The analysis for the required boron concentration is based on the shutdown requirements of Branch Technical Position 5.1 (SRP Section 5.4.7). Specifically, the shutdown margin requirements are consistent with that specified in Technical Specifications 3.1.1.1 and 3.1.1.2 for Operating Modes 1 through 4, and 5 through 6, respectively. The ROCS & DIT computer codes were used to calculate the boron concentration required to be present in the RCS for the shutdown margins required by the Technical Specifications. In the analysis, the analytical and measurement uncertainties were included to ensure that the upper bound boron requirements were predicted. The uncertainties include ±9% in scram worth, ±10% in moderator temperature feedback, ±15% in Doppler reactivity feedback, ±50% ppm in boron measurement uncertainty, and time constant of 26 hours for xenon decay to maximize the xenon poison effect.

The staff has reviewed the analysis for required boron concentration and finds the analysis acceptable since (1) the NRC approved codes, ROCS and DIT, were used for the analysis, (2) the appropriate uncertainties for the important core parameters were included to obtain the maximum required boron concentration and (3) the required boron concentrations provide shutdown margins consistent with the Technical Specification values.

3.1.2 Evaluation of Analysis for Available Boron Concentration

The calculational method to determine the available boron concentration is based on a steady state mass balance for boron in the entire RCS. It is assumed that the borated water added to the RCS is equal to the fluid volume contraction due to the cooldown while the pressurizer water level

is maintained constant. In the analysis, various core conditions were considered by the licensee to minimize the available boron reactivity effect. The limiting core conditions identified and used in the analyses were: (1) end-of-cycle conditions with initial RCS concentrations at zero ppm boron, (2) the core with the most reactive control rod fully stuck out, (3) plant power at 100% with 100% equilibrium xenon prior to initiation of plant shutdown and (4) a slow plant cooldown rate of 12.5°F/hr.

The staff has reviewed the analysis and the above core conditions used in the analysis. The staff concludes that use of the assumed core conditions is conservative with respect to minimizing the available boron reactivity effect since assumptions (1) and (2) minimize the existing boron worth in the core, and assumptions (3) and (4) maximize the xenon poison effect.

In addition, the use of cooldown rate of 12.5°F/hr is consistent with the plant test procedures for the boron mixing test during the natural circulation conditions performed at a similar Combustion Engineering plant. The licensee also submitted an analytical result which demonstrated that the boron reactivity effect for the case with the fastest cooldown rate of 75°F/hr, as allowed in the Technical Specifications, is bounded by the case with the slow cooldown rate of 12.5°F/hr. The staff, therefore, concludes that the assumptions used for the analysis are conservative since they minimize the boron reactivity effect.

In summary, the staff finds that an approved method was used to calculate the required boron concentration necessary for consistency with the shutdown margins required by Technical Specifications 3.1.1.1 and 3.1.1.2; conservative core conditions were used and the analytical results demonstrated the adequacy of the proposed boron concentration and volume for the BAMU tanks to maintain the safe shutdown margins required by the Technical Specifications. Therefore, the staff concludes that the calculational method and the analytical results included with the RAR are acceptable for referencing in application of the Technical Specification changes for Waterford-3.

3.2 Transient and Accident Evaluation

The licensee has performed an evaluation to assess the impact on transient and accident analyses as a result of reduction in boron concentration of the BAMU tanks.

In the RAR the licensee indicated that the borated water injected

from the BAMU tank was not taken credit for in the transient analyses in Chapter 15 of the Waterford-3 Final Safety Analysis Report (FSAR), but a boron concentration in the BAMU tanks of 1720 ppm was taken credit for in the LOCA analysis. Also, the licensee stated that since the revised boron concentration in the BAMU tanks is higher than 1720 ppm, the licensee concluded that the reduction in boron concentration for the BAMU tanks would not effect the analytical results in the FSAR for the transient and LOCA accidents.

The licensee will update Section 9.3.4 of the FSAR to be consistent with the analytical results in the RAR prior to implementation of the proposed Technical Specification changes.

The staff has reviewed the licensee's submittals and finds that reasonable assurance was provided to ensure safe plant operation with safety margins consistent with the existing Technical Specification requirements and, therefore, the proposed Technical Specification changes supported by the analytical results in the RAR are acceptable.

3.3 Technical Specification Changes

The specific Technical Specification changes and the reasons for their acceptability are:

Technical Specification 3/4.1.2.1

The proposed change to the Technical Specifications eliminates the requirement for heat tracing of the boric acid makeup (BAMU) system. The design purpose of heat tracing of the BAMU system is to maintain the temperature of fluid in the BAMU tanks high enough to prevent the boric acid from precipitating. The proposed changes to T.S. 3/4.1.2.8 reduce the concentration in the BAMU tanks to a maximum concentration of 3.5 weight percent boric acid, which will not precipitate at the borated water temperature higher than 50°F. The proposed changes also include a surveillance requirement to assure that the borated water source is operable by verifying a temperature higher than 55°F in the BAMU system. The staff finds that the proposed changes in boron concentration and surveillance requirement will preclude precipitation. Therefore, removal of the requirement of heat tracing for the BAMU system is acceptable.

Technical Specification 3/4.1.2.2

Currently, the Technical Specifications require two out of the following three flow paths for boron injection into the RCS: (1) a BAMU tank gravity feed path and associated heat tracing, (2) a BAMU tank path via a boric acid makeup pump and associated heat tracing, or (3) one flow path from the refueling water storage pool (RWSP).

The proposed changes require both existing flow paths (through the gravity feed valves and BAMU pumps) from any credited BAMU tank (or tanks) to be operable as compared to only one flow path from any credited BAMU tank to be operable for the existing Technical Specifications. The staff finds that the changes are consistent with the assumptions used in the analysis and are supported by the analytical results discussed in Section 2 and concludes that the changes are acceptable. The proposed change related to deletion of the requirement of one flow path from RWSP is essentially an administrative change and is also acceptable since the requirement of operability of the RWSP system is included in the existing Technical Specification 3.5.4, which assures the availability of the RWSP system required for the plant cooldown.

Figure 3.1-1 (for Operating modes 1 to 4)

This figure specifies the minimum required BAMU water volume and temperature as a function of stored boric acid concentration for the various plant operating modes. The revised figure specifies the minimum required water volume (contained in one or both BAMU tanks) as a function of boric acid concentration for a given boron concentration in the RWSP. The range of boron concentration in the BAMU tank has been reduced from 7.5 to 12.0 weight percent boric acid to 2.25 to 3.5 weight percent. The upper range of the required borated water volume increases from 5,850 gallons to 14,800 gallons. The staff finds that the revised Figure 3.1-1 is consistent with the analytical results (as discussed in Section 2) for plant conditions at Operating Modes 1 through 4, maintains the required safe shutdown margin, and is therefore acceptable.

Technical Specification 3/4.1.2.7 (for Operating Modes 5 and 6)

The existing Technical Specification requires that one of the two BAMU tanks and its associated heat tracing be operable with the tank's content in accordance with Figure 3.1-1. The proposed change will require one BAMU tank with a boron concentration between 2.25 and 3.50 weight percent and minimum borated water volume of 4,150 gallons. The change also deletes the need for referencing Figure 3.1-1 while shutdown in Mode 5 or 6. Based on its review, the staff finds that the changes are consistent with the analytical results discussed in Section 2 and are acceptable.

Technical Specification 3.1.2.8 (Operating Modes 1 to 4)

The current Technical Specification requires that at least one BAMU tank and its associated heat tracing be operable with the contents of boric acid in the tank to be consistent with the existing Figure 3.1-1.

The existing Figure 3.1-1 specifies the volume of boric acid of 5,850 gallons at a minimum concentration of 7.5 weight percent to be maintained in the BAMU tank. The proposed changes are to reduce the

range of boric acid concentration for one or both BAMU tanks with an allowable water content as specified in the revised Figure 3.1-1. The staff concludes that the changes are acceptable since the revised Figure 3.1-1 is acceptable as discussed in the last section.

Bases - Technical Specification 3/4.1.2

The Technical Specifications define the required components for the boron injection system which ensure that negative reactivity is available during each mode of operation and define boric acid concentration and volume requirements for the BAMU tanks and refueling water storage pool (RWSP).

The proposed changes revise the boric acid concentration and volume requirement for the BAMU tank in accordance with the proposed Figure 3.1-1 and the minimum required borated water volume of 58,000 gallons with boron concentration of 1720 ppm for RWSP alone.

The staff has reviewed the changes and found the changes are consistent with the assumptions used for the analysis and are supported by the analytical results discussed above and, therefore, concludes that the changes are acceptable.

3.4 CONCLUSIONS

The staff has reviewed the proposed changes to Waterford-3 Technical Specifications involving reduction in boric acid concentration and volume requirements for the BAMU system, and deletion of the requirement for heat tracing in the BAMU system. The staff concludes that the proposed changes are acceptable since the changes of boric acid requirements for the BAMU system do not reduce shutdown margin below the required values specified in Technical Specifications 3.1.1.1 and 3.1.1.2, and because the concentration of boric acid in the BAMU system has been reduced to a value which will not cause precipitation at ambient temperatures for the BAMU system, heat tracing in the BAMU system is not required. The proposed Technical Specifications are acceptable since they are consistent with the proposed changes of requirements for the BAMU system and are supported by the analytical results.

4.0 CONTACT WITH STATE OFFICIAL

The NRC staff has advised the Administrator, Nuclear Energy Division, Department of Environmental Quality, State of Louisiana of the proposed determination of no significant hazards consideration. No comments were received.

5.0 ENVIRONMENTAL CONSIDERATION

This amendment involves changes in the installation or use of facility components

located within the restricted area. The staff has determined that the amendment involves no significant increase in the amounts 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 proposed findings that the amendment involves no significant hazards consideration, and there has been no public comment on such findings. 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 this amendment.

6.0 CONCLUSION

Based upon our evaluation of the proposed changes to the Waterford 3 Technical Specifications, we have concluded that: there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and such activities will be conducted in compliance with the Commission's regulations and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public. We, therefore, conclude that the proposed changes are acceptable, and are hereby incorporated into the Waterford 3 Technical Specifications.

Dated: January 8, 1987

Principal contributor: S. Sun