

November 20, 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 70112

Dear Mr. Dewease:

SUBJECT: ISSUANCE OF AMENDMENT NO. 25 TO FACILITY OPERATING LICENSE
NPF-38 - WATERFORD STEAM ELECTRIC STATION, UNIT 3
(TAC NO. 65958)

The Commission has issued the enclosed Amendment No. 25 to Facility Operating License No. NPF-38 for the Waterford Steam Electric Station, Unit 3. The amendment consists of changes to the Operating License in response to your application dated July 24, 1987.

The amendment changes License Condition 2.C.14 by adding the fuel elevator and spent fuel handling machine as approved fuel assembly locations in the fuel handling building, revising the applicability of the License Condition to Modes 1-5 and introducing minimum boration requirements for fuel inspection and/or reconstitution outside an approved storage rack. The amendment also deletes the requirement (previously satisfied) to confirm the presence of Boraflex in the spent fuel storage racks prior to startup following the first refueling outage.

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

Sincerely,

/s/

James H. Wilson, Project Manager
Project Directorate - IV
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 25 to NPF-38
2. Safety Evaluation

cc w/enclosures:
See next page

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NRC PDR	PNoonan (3)	EJordan	EButcher
Local PDR	JWilson	JPartlow	ACRS (10)
PD4 Reading	JCalvo	ARM/LFMB	TBarnhart (4)
W. Hodges			

*See previous concurrences:

PD4/LA*	PD4/PM*	RSB*	OGC-Bethesda*	PD4/D <i>MC</i>
PNoonan	JWilson:sr	MWHodges		JCalvo
10/22/87	10/22/87	10/23/87	10/26/87	11/20/87

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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

License Condition 2.C.14

Dear Mr. Dewease:

SUBJECT: ISSUANCE OF AMENDMENT NO. 25 TO FACILITY OPERATING LICENSE
NPF-38 - WATERFORD STEAM ELECTRIC STATION, UNIT 3
(TAC NO. 65958)

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The amendment changes License Condition 2.C.14 by adding the fuel elevator and spent fuel handling machine as approved fuel assembly locations in the fuel handling building, revising the applicability of the License Condition to Modes 1-5 and introducing minimum boration requirements for fuel inspection and/or reconstitution outside an approved storage rack. The amendment also deletes the requirement (previously satisfied) to confirm the presence of Boraflex in the spent fuel storage racks prior to startup following the first refueling outage.

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J. Wermiel			

note corrections to safety evaluation

LTR NAME: WATERFORD 3 AMENDMENT NO. 25 *too*

PD4/LA <i>PH</i>	PD4/PM <i>JW</i>	RSB <i>MWH</i>	OGC-Bethesda	PD4/D
PNoonan	JWilson	JWermiel		JCalvo
10/24/87	10/22/87	10/23/87 <i>MWH</i>	10/26/87	1/87

Mr. Jerrold G. Dewease
Louisiana Power & Light Company

Waterford 3

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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. 25
License No. NPF-38

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Louisiana Power and Light Company (the licensee) dated July 24, 1987, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

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2. Accordingly, the license is amended by changing paragraph 2.C.14 of Facility Operating License No. NPF-38 to read as follows:

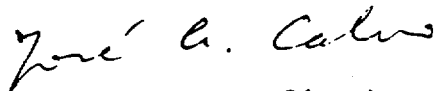
14. Fuel Movement in the Fuel Handling Building

In the fuel handling building, during Modes 1-5, no more than one fuel assembly shall be outside an approved shipping container, an approved storage rack, the fuel transfer tube (including upender), the fuel elevator, or the spent fuel handling machine.

In addition to the above fuel assembly inspection/reconstitution may take place outside of an approved storage rack, when required, provided that the inspection/reconstitution area is borated to a level at or about 1720 ppm.

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

FOR THE NUCLEAR REGULATORY COMMISSION



Jose A. Calvo, Director
Project Directorate - IV
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Date of Issuance: November 20, 1987



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 25 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 application dated July 24, 1987, Louisiana Power and Light Company (LP&L or the licensee) requested changes to Facility Operating License No. NPF-38 for Waterford Steam Electric Station, Unit 3. The proposed changes would revise the approved fuel assembly locations in the fuel handling building (FHB) during operational Modes 1-5 and allow fuel inspection/reconstitution outside an approved storage rack provided the inspection/constitution area was adequately borated.

2.0 DISCUSSION

The changes proposed by the licensee would revise License Condition 2.C.14 to add the fuel elevator and spent fuel handling machine (SFHM) as approved fuel assembly locations in the FHB during Modes 1-5. Present Mode 6 restrictions on fuel assembly locations would be removed. Fuel assembly inspection and/or reconstitution would be allowed outside an approved storage rack, when required, provided the inspection/reconstitution area is borated to an acceptable level.

In addition, the licensee proposes to remove the portions of License Condition 2.C.14 that directed confirmation of the presence of Boraflex in the spent fuel storage racks prior to startup following the first refueling outage for Waterford 3.

3.0 EVALUATION

On February 9, 1983 the licensee was issued NRC Materials License No. SNM-1913 authorizing the receipt, possession, inspection and storage of uranium enriched in the U-235 isotope, contained in fuel assemblies. In addition, the SNM license granted the licensee an exemption from the criticality alarm system requirements of 10 CFR 70.24 based upon inherent features associated with the storage and inspection of unirradiated fuels. At that time, the staff reviewed the new fuel and spent fuel pool storage racks and designated them as approved storage locations. Similarly, shipping container design was reviewed and, therefore, criticality configurations involving shipping containers need not be further considered.

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A condition of the SNM license and a basis of the 10 CFR 70.24 exemption specified that "no more than one fuel assembly shall be out of its shipping container or storage location at a given time."

Relevant provisions of SNM-1913 were incorporated into the licensee's Facility Operating License NPF-38 upon its issuance March 16, 1985. Included was NPF-38 License Condition 2.C.14 which provided that "no more than one fuel assembly shall be outside an approved shipping container, storage rack or fuel transfer tube in the fuel handling building at any time."

The licensee's proposed changes would amend License Condition 2.C.14 to apply only to Modes 1-5, to add the fuel elevator and SFHM as approved fuel assembly locations during Modes 1-5, and allow fuel inspection and/or reconstitution outside an approved storage rack. This evaluation covers the proposed changes individually with respect to operational mode.

Refueling (Mode 6)

The licensee proposes the removal of fuel assembly location restrictions in the FHB during Mode 6. To evaluate this proposed change the staff reviewed the potential for a critical configuration of new or irradiated fuel to ensure that sufficient controls exist to preclude a criticality event.

Irradiated fuel assembly movements are carried out underwater during refueling operations. The moderating ability of water is such that two or more fuel assemblies in close proximity can lead to a criticality event. Consequently, during refueling the staff places minimum boration requirements on the water systems in use for irradiated fuel movements. In the case of Waterford 3, Technical Specification 3.9.1 requires that the reactor coolant system, refueling canal (and connected water areas) be borated sufficiently to ensure Keff less than or equal to 0.95 or a boron concentration greater than or equal to 1720 ppm, whichever is the more restrictive reactivity condition. This Technical Specification is adequate to prevent an underwater criticality event, even for unirradiated fuel.

During refueling, new fuel movement may also occur. The storage of new fuel in the spent fuel pool takes place largely underwater and is adequately protected by the boration requirements of Technical Specification 3.9.1. New fuel, however, is also temporarily stored on the FHB deck and moved by crane through the air to the fuel elevator. In order to approach a critical configuration new fuel assemblies must be optimally stacked on the FHB deck and a moderator introduced (e.g., unborated water). The staff has reviewed the potential moderator sources in the FHB (three 1½ inch fire hose lines and one 1 inch eyewash supply line) to determine their potential for flooding the FHB deck. The FHB deck and the floor below are composed of grating and hatch covers, which allow water to flow to the FHB basement. The FHB deck lies approximately 81 feet above the basement level. The FHB cross-sectional area is approximately 7000 ft² (110 ft. x 65 ft.). Conservatively correcting for the volume of the new

fuel vault and spent fuel pool a total volume of over 400,000 ft³ would have to be filled prior to water reaching the level of the FHB deck. Given the restricted water sources in the FHB, flooding the FHB deck is not credible.

For the reasons stated above, the staff concludes that License Condition restrictions on fuel assembly locations during Mode 6 are unnecessary when Technical Specification 3.9.1 is in effect.

Modes 1-5

Unlike Mode 6, the boration requirements of Technical Specification 3.9.1 are not applicable in Modes 1-5. The staff notes that the practice of the licensee is to maintain the same boration levels during Modes 1-5 as apply in Mode 6; however absent a Technical Specification to that effect, credit may not be allowed for boration in Modes 1-5.

The licensee's proposed changes would add the SFHM and fuel elevator to the list of approved FHB fuel assembly locations during Modes 1-5.

The fuel elevator is at a fixed location in the FHB widely separated from other approved fuel assembly locations. The fuel elevator is approximately 30 ft. from the nearest storage rack, the nearest new fuel laydown area and from the fuel transfer tube. The staff concludes that the separation of the fuel elevator from other fixed fuel assembly locations is adequate to preclude a criticality event.

The proposed addition of the SFHM to the list of approved fuel assembly locations introduces a mobile means to inadvertently place two or more fuel assemblies in close proximity (e.g., dropping a fuel assembly from the SFHM next to another assembly). The licensee has identified two areas where fuel assemblies could come in contact: 1) the FHB crane and SFHM (both carrying a fuel assembly) could converge on the fuel elevator which could also contain a fuel assembly, and 2) the FHB crane carrying a fuel assembly from the east new fuel laydown area could approach the SFHM, also carrying an assembly, on the north edge of the spent fuel pool. The staff has independently reviewed possible paths of fuel movement in the FHB and concludes that the licensee has adequately identified the potential areas of concern.

In order for the assemblies carried by the FHB crane and SFHM to approach a critical configuration it is necessary for the FHB crane to be positioned over the SFHM. The assembly carried by the FHB crane must be inadvertently dropped so as to strike the assembly carried by the SFHM, dislodge it, and both assemblies must come to rest in length-wise contact. The staff has evaluated this scenario and determined that it is not credible due to the inability of the FHB crane to raise a fuel assembly sufficiently high to clear the bridge of the SFHM.

The licensee has performed criticality analyses for the case of the FHB crane or SFHM dropping a fuel assembly next to an assembly resting on the fuel elevator. The fuel elevator includes a cage structure into which the fuel assembly is placed. The angle iron offsets of the cage limit

the point of closest approach of a dropped fuel assembly such that the limiting configuration results in a Keff of approximately 0.925 - i.e., well below the protection afforded by the boration requirements of Technical Specification 3.9.1. Based on the licensee's criticality analyses and the evaluations discussed above, the staff concludes that sufficient controls exist at Waterford 3 that addition of the SFHM and fuel elevator to the list of approved FHB fuel assembly locations in Modes 1-5 does not increase the potential for a criticality event.

Fuel Inspection and/or Reconstitution

Although fuel assembly inspection/reconstitution would likely be performed at approved storage rack locations, the licensee has indicated that certain situations may warrant the use of temporary inspection/reconstitution locations and equipment in the FHB. For such cases the licensee has committed to borate the inspection/reconstitution area to at least 1720 ppm. Because this proposed change is equivalent to the criticality protection provided by Technical Specification 3.9.1 (see the Refueling evaluation above) the staff concludes that the proposed change is adequate for criticality protection.

Boraflex Inspection

The License Condition change proposed by the licensee would delete the requirement to confirm the presence of Boraflex in the spent fuel storage racks prior to startup following the first refueling outage. The confirmatory inspection was addressed by the licensee in a letter dated June 6, 1986. The staff has previously reviewed the results of the licensee Boraflex inspection and confirmed, by letter dated June 23, 1986, satisfactory completion of the License Condition. Deletion of the Boraflex testing requirement is therefore acceptable.

The License Condition changes proposed by the licensee will provide increased flexibility in fuel movement while maintaining sufficient controls to preserve the basis for the licensee's exemption to 10 CFR 70.24 and minimize the potential for a criticality condition. The proposed License Condition changes are, therefore, acceptable.

4.0 CONTACT WITH STATE OFFICIAL

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

5.0 ENVIRONMENTAL CONSIDERATION

The amendment relates to changes in installation or use of a facility component located within the restricted area. The 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. 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 its evaluation of the proposed changes to the Waterford 3 Operating License, the staff has 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. The staff, therefore, concludes that the proposed changes are acceptable, and are hereby incorporated into the Waterford 3 Operating License.

Dated: November 20, 1987

Principal Contributor: J. Wilson