

June 24, 1996

Mr. Michael B. Sellman  
Vice President Operations  
Entergy Operations, Inc.  
P. O. Box B  
Killona, LA 70066

SUBJECT: ISSUANCE OF AMENDMENT NO. 120 TO FACILITY OPERATING LICENSE  
NPF-38 - WATERFORD STEAM ELECTRIC STATION, UNIT 3 (TAC NO. M93314)

Dear Mr. Sellman:

The Commission has issued the enclosed Amendment No. 120 to Facility Operating License No. NPF-38 for the Waterford Steam Electric Station, Unit 3. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated August 11, 1995, as supplemented by letter dated February 12, 1996.

The amendment changes the Appendix A TSs by reducing the minimum reactor coolant cold leg temperature to 541 °F from 544 °F in TS Section 3.2.6, "Reactor Coolant Cold Leg Temperature."

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

Sincerely,

Orig. signed by  
Chandu P. Patel, Project Manager  
Project Directorate IV-1  
Division of Reactor Projects - III/IV  
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosures: 1. Amendment No.120 to NPF-38  
2. Safety Evaluation

cc w/encls: See next page

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

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Entergy Operations, Inc.  
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*Chandu P. Patel*

Chandu P. Patel, Project Manager  
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Office of Nuclear Reactor Regulation

Docket No. 50-382

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Entergy Operations, Inc.

Waterford 3

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

ENERGY OPERATIONS, INC.

DOCKET NO. 50-382

WATERFORD STEAM ELECTRIC STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 120  
License No. NPF-38

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Entergy Operations, Inc. (the licensee) dated August 11, 1995, as supplemented by letter dated February 12, 1996, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, 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. 120, 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. This license amendment is effective as of its date of issuance to be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

*Chandu P. Patel*

Chandu P. Patel, Project Manager  
Project Directorate IV-1  
Division of Reactor Projects - III/IV  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: June 24, 1996

ATTACHMENT TO LICENSE AMENDMENT NO. 120

TO FACILITY OPERATING LICENSE NO. NPF-38

DOCKET NO. 50-382

Replace the following page of the Appendix A Technical Specifications with the attached page. The revised page is identified by Amendment number and contains a vertical line indicating the area of change. The corresponding overleaf page is also provided to maintain document completeness.

REMOVE PAGE

3/4 2-11

INSERT PAGE

3/4 2-11

## POWER DISTRIBUTION LIMITS

### 3/4.2.6 REACTOR COOLANT COLD LEG TEMPERATURE

#### LIMITING CONDITION FOR OPERATION

---

3.2.6 The reactor coolant cold leg temperature ( $T_c$ ) shall be maintained between 541°F and 558°F.\*

APPLICABILITY: MODE 1 above 30% of RATED THERMAL POWER.

ACTION:

With the reactor coolant cold leg temperature exceeding its limit, restore the temperature to within its limit within 2 hours or reduce THERMAL POWER to less than 30% of RATED THERMAL POWER within the next 4 hours.

#### SURVEILLANCE REQUIREMENTS

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4.2.6 The reactor coolant cold leg temperature shall be determined to be within its limit at least once per 12 hours.

\*Following a reactor power cutback in which (1) Regulating Groups 5 and/or 6 are dropped or (2) Regulating Groups 5 and/or 6 are dropped and the remaining Regulating Groups (Groups 1, 2, 3, and 4) are sequentially inserted, the upper limit on  $T_c$  may increase to 568°F for up to 30 minutes.

POWER DISTRIBUTION LIMITS

3/4.2.7 AXIAL SHAPE INDEX

LIMITING CONDITION FOR OPERATION

---

3.2.7 The AXIAL SHAPE INDEX (ASI) shall be maintained within the limits specified in the COLR.

APPLICABILITY: MODE 1 above 20% of RATED THERMAL POWER.\*

ACTION:

With the AXIAL SHAPE INDEX outside the limits specified in the COLR, restore the AXIAL SHAPE INDEX to within its limit within 2 hours or reduce THERMAL POWER to less than 20% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

---

4.2.7 The AXIAL SHAPE INDEX shall be determined to be within its limit at least once per 12 hours using the COLSS or any OPERABLE Core Protection Calculator channel.

\*See Special Test Exception 3.10.2.





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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 120 TO

FACILITY OPERATING LICENSE NO. NPF-38

ENERGY OPERATIONS, INC.

WATERFORD STEAM ELECTRIC STATION, UNIT 3

DOCKET NO. 50-382

1.0 INTRODUCTION

By application dated August 11, 1995, as supplemented by letter dated February 12, 1996, Entergy Operations, Inc. (the licensee), submitted a request for changes to the Waterford Steam Electric Station, Unit 3 (Waterford 3), Technical Specifications (TSs). The requested changes would reduce the minimum reactor coolant cold leg temperature to 541 °F from 544 °F in TS Section 3.2.6, "Reactor Coolant Cold Leg Temperature."

2.0 EVALUATION

Efforts to improve steam generator tube integrity at Waterford 3 have resulted in reductions in operating hot leg temperatures. As a result, Waterford 3 operates regularly very close to the lower end of the acceptable temperature range specified in TS 3.2.6. In an effort to reduce the operator burden of maintaining the cold leg temperature very close to the TS limit and increasing operating margin, the licensee is reducing the TS minimum cold leg temperature by 3 °F. The operators will have more operating margin and the likelihood of violating the TS is reduced. The current TS permits operation above 30% power if the cold leg temperature is maintained between 544 °F and 558 °F. The revised TS would require the cold leg temperature be maintained between 541 °F and 558 °F.

There are no changes to any other TSs as a result of the reduction in cold leg temperature. The cold leg temperature or core inlet temperature is an input to the transient analyses that the licensee was required to perform to support licensing. These analyses are documented in Chapter 15 of the Updated Final Safety Analysis Report (UFSAR). The licensee evaluated the impacts of the proposed TS amendment on the accident analyses in Chapter 15 of the UFSAR.

To evaluate the impacts of the change the licensee grouped the transients in three categories. In the first category, the licensee identified the analyses that did not use the lower limit value of the core inlet temperature but used the high limit because it is more limiting. These analyses do not need to be reevaluated because the current analyses remain conservative. Reactor cooldown events like steam dump valves failing open and decrease in reactor coolant inventory events were included in this group because the higher cold leg temperatures cause a more severe blowdown and more severe cooldown in the cooldown events and more energetic blowdowns for the decrease in reactor coolant inventory events.

In the second category, the licensee identified the events where the results or the consequences evaluated are insensitive to the core inlet temperature. The staff reviewed each of these events documented in the FSAR and verified that the lower limit core inlet temperature was not used and the results were not affected by the core inlet temperature. The staff review determined that the licensee's conclusions were reasonable and that no new analysis needed to be performed for these transients. Events that were included in this group included an increase in reactor coolant system (RCS) inventory.

In the last category, the licensee identified those events where the analysis is affected by the reduction in RCS cold leg temperature. Events which were affected by the reduced cold leg temperature include decreased heat removal events, decreased reactor coolant flow events, and reactivity anomaly events. These transients were all reanalyzed using the lower cold leg temperature.

The limiting decreased heat removal transient in terms of peak RCS and steam line pressure for the change was the loss of condenser vacuum. For this transient, the decreased core inlet temperature delays the opening of the main steam safety relief valves because the initial steam pressure is slightly less at a lower core inlet temperature. The delay allows the RCS to reach a slightly higher pressure than calculated before. The new peak RCS pressure was calculated at 2728 psia which is less than 2750 psi which is the safety limit. The safety limit, 2750 psi is 110% of the design pressure. Because the calculated peak pressure is less than 110% of the design pressure, the change is acceptable. The analysis was done using a temperature of 539 °F, rather than 541 °F (the lower limit), to include a 2 °F instrument uncertainty.

For the decreased reactor coolant flow events, the lower core inlet maintains subcooling in the core and limits the negative reactivity feedback from void formation. The total loss of forced flow transient analysis is used to establish some of the input parameters for the core operating limit supervisory system (COLSS). The licensee had already performed the calculations using a 4 °F decrease in core inlet temperature to support a prior cycle. The reactivity anomaly events were also reanalyzed, using a 3 °F reduction in the core inlet temperature, to support the current core analyses for the COLSS and the core protection calculator system (CPCS). The reduced core inlet temperature will be used to analyze future cores for all transients evaluated to maintain the existing margin. The licensee reanalysis is sufficient to support the requested change to the plant TSs.

As part of the justification to support the decrease in the minimum reactor coolant cold leg temperature, the licensee performed evaluation of the structural integrity for the RCS and components. The evaluation consisted of reviewing the minimum design margin and applying the leak-before-break (LBB) criteria for the primary coolant loop piping that was approved by the NRC for Waterford 3 in 1990. The Waterford 3 design basis analyses were based on the blowdown loads due to postulated guillotine breaks at the RCS piping. Using these loads, the current minimum design margin available is about 17% at the reactor outlet nozzle. The application of the LBB criteria eliminates the

design basis blowdown loads from limiting postulated RCS guillotine breaks. The licensee concluded that the large decrease in design loads from LBB criteria and the available design margin are more than enough to accommodate the increase in load from transients and accidents that are due to the decrease in cold leg temperature of 3 °F.

The licensee has identified all the FSAR Chapter 15 analyses that are affected by the 3 °F reduction in the core inlet temperature and has shown the change is acceptable. For the loss of condenser vacuum, the licensee recalculated the peak pressures and submitted the results. For the analyses that are recalculated each cycle, to support the COLSS, the affected analyses have already been performed using a lower core inlet temperature to support the prior cycle. The staff's review concluded that the operation of Waterford 3 at a 3 °F reduction in the minimum reactor coolant cold leg temperature is acceptable without any adverse effects on the structural integrity of the RCS, components and their supports. Therefore, the staff finds the requested change acceptable.

### 3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Louisiana 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 (61 FR 25706). 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.

## 6.0 REFERENCES

1. Letter from R. P. Barkhurst (Entergy Operations, Inc.) to NRC, "Waterford 3 SES, Docket No. 50-382, License Number No. NPF-38, Technical Specification Change Request NPF-38-171," dated August 11, 1995.
2. Letter from R. F. Burski (Entergy Operations, Inc.) to NRC, "Waterford 3 SES, Docket No. 50-382, License Number No. NPF-38, Core Operating Limits Report, Revision 1," dated December 14, 1995.
3. Letter from R. F. Burski (Entergy Operations, Inc.) to NRC, "Waterford 3 SES, Docket No. 50-382, License Number No. NPF-38, Request for Additional Information Regarding Technical Specification Change Request NPF-38-171," dated February 12, 1996.
4. Waterford SES - Unit 3, Final Safety Analysis Report.

Principal Contributors: C. Jackson  
C. Wu

Date: June 24, 1996