October 4, 2001

Mr. John T. Herron
Vice President Operations
Entergy Operations, Inc.
17265 River Road
Killona, LA 70066-0751

SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 - ISSUANCE OF AMENDMENT RE: EMERGENCY FEEDWATER SYSTEM (TAC NO. MB2010)

Dear Mr. Herron:

The Commission has issued the enclosed Amendment No. 173 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 May 22, 2001.

The submittal requests a change to TS 3.7.1.2 and Surveillance Requirement 4.7.1.2 for the emergency feedwater system. The TS change request will expand and clarify the current specification.

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

Sincerely,

/RA/

N. Kalyanam, Project Manager, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosures: 1. Amendment No. 173 to NPF-38
2. Safety Evaluation

cc w/encls: See next page

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ENTERGY OPERATIONS, INC.

DOCKET NO. 50-382

WATERFORD STEAM ELECTRIC STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 173
License No. NPF-38

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

   A. The application for amendment by Entergy Operations, Inc. (EOI) dated May 22, 2001, 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. 173, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. EOI 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 and shall be implemented within 60 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Robert A. Gramm, Chief, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: October 4, 2001

ATTACHMENT TO LICENSE AMENDMENT NO. 173

TO FACILITY OPERATING LICENSE NO. NPF-38

DOCKET NO. 50-382

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove	Insert
3/4 7-4	3/4 7-4
3/4 7-5	3/4 7-5

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 173 TO

FACILITY OPERATING LICENSE NO. NPF-38

ENTERGY OPERATIONS, INC.

WATERFORD STEAM ELECTRIC STATION, UNIT 3

DOCKET NO. 50-382

1.0 INTRODUCTION

By application dated May 22, 2001, Entergy Operations, Inc. (the licensee) submitted a request for a change to Technical Specification (TS) 3.7.1.2 and Surveillance Requirement (SR) 4.7.1.2 for the Waterford Steam Electric Station, Unit 3 (Waterford 3) emergency feedwater (EFW) system. This change request was previously submitted by letters dated May 28, 1998, January 31, 2000, and July 27, 2000, and subsequently withdrawn by letter dated September 20, 2000. This resubmittal revises previously proposed ACTIONs b, c, and d, and proposes new ACTIONs to address various combinations of inoperable equipment.

2.0 BACKGROUND

The EFW system at Waterford 3 consists of two (50 percent capacity) motor-driven pumps, and one (100 percent capacity) turbine-driven pump. Steam is provided to the turbine-driven EFW (TDEFW) pump from each of the two steam generators (SGs) through separate flow paths. All three pumps are connected to a common discharge header. The EFW flow path for each SG is designed to transport EFW flow from the common EFW pump discharge header to the main feedwater line (down stream of the main feedwater isolation valves) through two parallel legs. Each parallel leg contains a flow control valve and an isolation valve in series. These valves are fail-open direct current powered pneumatic valves. Safety-related nitrogen accumulators serve as backup to the instrument air system for these valves. Each nitrogen accumulator supplies a pair of EFW valves (one flow control valve and one isolation valve) in different parallel legs to the same SG. One flow path through either of the two parallel legs to a SG is capable of providing 100 percent of the minimum required flow to its associated SG and performing the required decay heat removal safety function without reliance on the other SG.

The Limiting Condition for Operation (LCO) for current TS 3.7.1.2.a requires that the TDEFW pump be capable of being powered from an operable steam supply system. A concern was raised at Waterford 3 over the need to enter TS ACTION 3.7.1.2.a when one of the two steam supplies to the TDEFW pump is either out of service or inoperable. If a main steam line break or a main feedwater line break occurs on one SG and a supply line from the other SG is out of service, the turbine-driven pump becomes non-functional. Considering a single active failure of one motor-driven pump, the remaining motor-driven pump with 50 percent capacity is insufficient to perform the EFW design basis safety function. This concern was documented in

Licensee Event Report (LER) 96-002-00. In this LER, the licensee committed to adopt an EFW TS similar to that in NUREG-1432, "Standard Technical Specifications Combustion Engineering Plants." Because the requirements of TS 3.7.1.2 for Waterford 3 were not very clear, additional concerns were identified regarding adequacy of surveillance testing for the EFW flow paths and required ACTIONs when EFW valves are inoperable. By letters dated May 28, 1998, January 31, 2000, and July 27, 2000, the licensee proposed changes to TS 3.7.1.2 and SR 4.7.1.2 to resolve the concerns that were raised, and to expand and clarify the existing EFW TS requirements for Waterford 3. This initial TS change request was withdrawn and subsequently resubmitted by letter dated May 22, 2001, in order to adopt a more generic approach based on flow capability, as recommended by the Nuclear Regulatory Commission (NRC or the Commission) staff. This more recent submittal is the subject of this evaluation.

3.0 EVALUATION

The following specific changes associated with TS 3.7.1.2 were proposed by the licensee and evaluated by the staff:

Limiting Condition for Operation

The current LCO requires that three EFW pumps and associated flow paths be operable. However, the plant design is such that EFW flow paths are not readily associated with a particular pump or train. Therefore, the LCO is being revised to require that three EFW pumps and two flow paths be operable. The proposed change also relocates pump specific details to the TS Bases Section, and eliminates the misleading wording concerning "operable steam supply system." Finally, the proposed change expands the TS Bases Section to include a definition of the flow paths and an explanation of the LCO, ACTIONs, and SRs similar to that contained in NUREG-1432. The staff agrees these changes are administrative and they clarify existing TS requirements and are, therefore, acceptable.

ACTION "a"

New ACTION "a" is added to provide a more explicit requirement for both steam supplies for the TDEFW pump to be operable. The proposed action allows one of the two steam supplies to be inoperable for up to 7 days. The 7-day completion time was established based on the redundant operable steam supply line from the other SG, the availability of redundant operable motor-driven EFW (MDEFW) pumps, and the low probability of an event occurring that would require use of the inoperable steam supply line. The proposed requirement is consistent with NUREG-1432, but the Standard TS (STS) requirement is based on a plant design that has 100 percent capacity MDEFW pumps. In order to correctly apply the STS requirement to Waterford 3 (which has 50 percent capacity MDEFW pumps), the licensee has proposed additional TS requirements for situations that involve inoperability of a steam supply line and a MDEFW pump at the same time (see ACTION "b" below). Given this additional restriction, the staff considers the proposed requirement and ACTION statement for the TDEFW pump steam supply lines to be appropriate and acceptable.

ACTION "b"

New ACTION "b" is proposed to address the situation that involves an inoperable steam supply line for the TDEFW pump at the same time that one of the MDEFW pumps is inoperable. A

7-day completion time for an inoperable steam supply line to the TDEFW pump is appropriate (as discussed in ACTION “a”, above) if both of the 50 percent capacity MDEFW pumps remain operable.

However, if one of the MDEFW pumps is inoperable at the same time that a steam supply line for the TDEFW pump is inoperable, sufficient EFW capacity would not be available to mitigate a main steam line break or main feedwater line break associated with the SG that has the remaining operable steam supply line to the TDEFW pump. For this particular scenario, only one 50 percent capacity MDEFW pump would be available. Therefore, the licensee has proposed a 24-hour completion time for the situation that involves inoperability of a steam supply line for the TDEFW pump at the same time that one of the MDEFW pumps is inoperable. The selection of 24 hours for the completion time is based on the remaining operable steam supply line for the TDEFW pump, the remaining operable MDEFW pump, and the low probability of an event occurring that would render the remaining steam supply for the TDEFW pump inoperable. The staff agrees that a 24-hour completion time is appropriate and acceptable for this situation.

ACTION “c”

New ACTION “c” is proposed to address the situation that involves an inoperable steam supply line for the TDEFW pump concurrent with both MDEFW pumps being inoperable. The proposed action requires the unit to be placed in Hot Standby in 6 hours and in Hot Shutdown within the following 6 hours. The EFW system is seriously degraded in this condition, but remains capable of cooling the reactor coolant system (RCS) to shutdown cooling entry conditions, provided a failure associated with the TDFEW pump does not occur. The staff agrees that the proposed action is appropriate and acceptable given the seriousness of this situation.

ACTION “d”

New ACTION “d” is proposed to expand the current 72-hour completion time for one inoperable EFW pump (existing ACTION “a”) to include conditions that are not addressed by proposed ACTIONs “a”, “b”, or “c”, that render the EFW system inoperable but still able to deliver 100 percent flow to either SG. In this condition, the EFW system is able to perform its safety function, provided no additional failures are assumed and the proposed completion time is consistent with what is allowed by NUREG-1432 for similar conditions. The licensee also recognized and discussed means available to prevent SG overfill, and confirmed that sufficient time was available to complete any operator actions that might be required in accordance with American National Standards Institute/American Nuclear Society (ANSI/ANS)-58.8-84. Therefore, the staff agrees that the proposed ACTION is appropriate and acceptable.

ACTION “e”

New ACTION “e” is proposed to revise existing ACTION “b” for two EFW pumps inoperable to specify that with the EFW system inoperable for reasons other than those described in proposed ACTIONs “a”, “b”, or “c”, and able to deliver at least 100 percent flow to the SGs, the unit must be placed in Hot Standby in 6 hours and in Hot Shutdown within the following 6 hours. This ACTION is proposed to address the situation where the EFW flow paths are degraded to the point where it is not possible to provide 100 percent flow to either SG (see proposed

ACTION “d”), but it is possible to provide at least 100 percent flow to a single SG or to a combination of the two SGs (e.g., 40 percent flow to one SG, and 60 percent flow to the other SG). Although the EFW system can support a cooldown of the RCS to shutdown cooling entry conditions when in this condition, the EFW system is seriously degraded and may not be able to mitigate a main steam line or feedwater line break event. This condition is similar to the one addressed by proposed ACTION “c”, and the completion time is the same for both conditions. Therefore, the staff considers the proposed ACTION to be appropriate and acceptable.

ACTION “f”

New ACTION “f” is proposed to revise existing ACTION “c” for three EFW pumps inoperable. The proposed ACTION specifies that with the EFW system inoperable and unable to deliver 100 percent flow to the SGs, immediate action must be taken to restore the ability to provide 100 percent flow (i.e., either 100 percent flow to a single SG or 100 percent combined flow to both SGs). The proposed action also clarifies that TS ACTIONs requiring Mode changes are suspended until the EFW system is capable of delivering 100 percent combined flow to the SGs. While in this condition, the EFW system is seriously degraded and unable to provide sufficient flow to the SGs to cool the RCS down to shutdown cooling entry conditions if called upon. Any mode or power level changes should be avoided when in this condition in order to minimize challenges to the decay heat removal function. The proposed action is consistent with the requirements established by NUREG-1432 for this situation and is considered to be acceptable.

Surveillance Requirement “a”

The proposed change will require verification that each manual, power-operated, or automatic valve in each EFW flow path and in both steam supply lines to the TDEFW pump that is not locked, sealed, or otherwise secured in position is in its correct position. This change will enhance the existing SR by clearly specifying all the valves in the EFW system that require verification.

Surveillance Requirement “b”

The existing surveillance requires that a single flow point be verified for each EFW pump to ensure pump performance has not degraded below the point where it is capable of performing its safety function. The proposed change will remove test-specific acceptance criteria and require that the EFW pumps be demonstrated operable pursuant to Specification 4.0.5, which invokes the inservice test (IST) program in accordance with Section XI of the American Society of Mechanical Engineers, Boiler and Pressure Vessel Code. The minimum required EFW flow is addressed in the TS Bases and Chapter 10.4.9 of Final Safety Analysis Report.

The required minimum EFW flow rate will be reflected in the acceptance criteria for the IST to assure that the pumps are capable of performing their safety function consistent with the safety analyses of record. The proposed change will also replace the current exception from TS 4.0.4 with a new exception, which would require the TDEFW pump test to be performed 24 hours after exceeding 750 pounds per square inch, gauge (psig) in the SGs. This will allow time for sufficient steam pressure to be developed for performing the test, which is consistent with NUREG-1432 requirements, and is considered to be acceptable.

Surveillance Requirement “c”

The revised surveillance proposes to remove the words “during shutdown”, and change “...emergency feedwater actuation test signal” to “... actual or simulated actuation signal.” These changes do not affect technical requirements and are considered to be acceptable. A Note will be added to indicate that this SR is not required to be performed for the TDEFW pump until 24 hours after exceeding 750 psig in the SGs. This change is consistent with the changes made in SR “b” (above) and it is considered to be acceptable.

Surveillance Requirement “d”

The revised surveillance is reworded to require performance prior to entering Mode 2, and deletes the Specification 4.0.4 exception. This is acceptable because the decay heat load is not significant during Mode 3 following long term plant shutdown, and EFW system alignment will continue to be verified before sufficient core heat is generated.

Technical Specification Bases

For informational purposes, the licensee’s submittal included revised TS Bases pages that reflect the TS changes that are proposed. The revised Bases pages provide additional detail and appear to be consistent with the proposed TS changes. Therefore, we have no objections to the information that is contained in the revised TS Bases.

4.0 SUMMARY

Based on the information that was provided and the considerations discussed in Section 3.0 (above), we consider the proposed TS changes to be acceptable. We also have no objections to the information contained in the revised TS Bases section that was provided for informational purposes.

5.0 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.

6.0 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 and changes surveillance requirements. 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 (66 FR 34283, dated June 27, 2001). The amendment also relates to changes in recordkeeping, reporting, or administrative procedures or requirements. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) and 10 CFR 51.22(c)(10). 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.

7.0 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.

Principal Contributors: James Tatum
Chu-Yu Liang

Date: October 4, 2001