October 29, 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: REACTOR PROTECTION SYSTEM AND ENGINEERED SAFETY FEATURES ACTUATION SYSTEM SENSOR RESPONSE TIME TESTING (TAC NO. MB2422)

Dear Mr. Herron:

The Commission has issued the enclosed Amendment No. 175 to Facility Operating License No. NPF-38 for the Waterford Steam Electric Station, Unit 3. The amendment consists of changes to the Technical Specifications Definitions 1.12 and 1.25, in response to your application dated July 18, 2001. The changes will allow either an allocated or a measured response time to be utilized for the sensors in the Reactor Protective System and Engineered Safety Features Actuation System instrument loops.

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. 175 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. 175
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 July 18, 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. 175, 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 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 29, 2001

ATTACHMENT TO LICENSE AMENDMENT NO. 175

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
I	I
1-3	1-3
----	1-3a
1-6	1-6

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 175 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 July 18, 2001, Entergy Operations, Inc. (Entergy or the licensee), submitted a request for changes to the Waterford Steam Electric Station, Unit 3 (Waterford 3), Technical Specifications (TSs). The effect of the proposed changes will be a change to the TS Definitions 1.12 and 1.25.

The amendment will allow either an allocated sensor response time or a measured sensor response time for the identified Engineered Safety Features Actuation System (ESFAS) and Reactor Protective System (RPS) pressure sensors when performing response time testing (RTT). The licensee has requested that the Nuclear Regulatory Commission (NRC or the Commission) staff expedite its review of the proposed amendment so that the amendment may be issued during the upcoming Waterford 3 refueling outage in Spring of 2002.

2.0 BACKGROUND

The requirement for periodic testing of reactor trip systems is established in 10 CFR 50.55a, “Codes and standards.” Section 50.55a(h)(2), "Protection Systems," states the following: “For nuclear power plants with construction permits issued after January 1, 1971, but before May 13, 1999, protection systems must meet the requirements stated in either IEEE [Institute of Electrical and Electronics Engineers] [Standard] 279, “Criteria for Protection Systems for Nuclear Power Generating Stations,” or IEEE [Sandard] 603-1991, “Criteria for Safety Systems for Nuclear Power Generating Stations,” and the correction sheet dated January 30, 1995. For nuclear power plants with construction permits issued before January 1, 1971, protection systems must be consistent with their licensing basis or may meet the requirements of IEEE [Standard] 603-1991 and the correction sheet dated January 30,1995.”

In addition, 10 CFR 50.36(c)(2)(ii)(A) requires establishment of a TS limiting condition for operation for “Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.” Section 50.36(c)(3) also states that “Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.”

Because the times for equipment operation in an accident analysis are the summation of all response times of components within the protective function, a value for the sensor response time must be included. The sensor response time can be an actual measured value or it can be an assumed value that is allocated to the sensor based on NRC-approved methodology. Combustion Engineering Owners Group (CEOG) topical report (TR) CE [Combustion Engineering] NPSD-1167, "Elimination of Pressure Sensor Response Time Testing Requirements," Revision 2, is such a methodology.

In letters dated May 12 and June 6, 2000, the CEOG submitted CE NPSD-1167, Revision 2, which proposed eliminating the requirements for RTT of selected pressure sensors in the RPS and ESFASs (i.e., the emergency core cooling system and the isolation actuation system), and incorporated NRC and utility comments on Revision 1 and corrected Appendices A and C. The methodology in Revision 2 is that the sensor response time is derived from the original manufacturer or from a statistical analysis of the results of previous RTTs, where the statistical analysis is sufficiently conservative to ensure that the allocated response time assigned to the sensor will be valid for 95 percent of the population with a 95 percent confidence level.

The TR modifies pressure transmitter allocated response times from values that were based on historical data collected at plants to values that are based on vendor data of expected response times of properly operating instruments. The TR includes plant-specific information from 5 licensees with a total of 11 nuclear power plants, including Waterford 3. The following are the pressure sensors for which the CEOG requested elimination of RTT:

- Rosemount Differential Pressure or Pressure Transmitters Model 1152 DP, HP, AP, and GP, range codes 3, 4, 5, 6, 7, 8, 9, and 0.
- Rosemount 1153 Differential Pressure or Pressure Transmitters Models 1153 D, H, A, and G, range codes 3, 4, 5, 6, 7, 8, and 9.
- Rosemount 1154 Differential Pressure or Pressure Transmitters Models DP, HP, and GP, range codes 4, 5, 6, 7, 8, 9, and 0.
- Rosemount 1154H Differential Pressure or Pressure Transmitters Models D, H, and S, range codes 4, 5, 6, 7, 8, and 9.
- Barton 763 and 763A Pressure Transmitter and 764 Differential Pressure Transmitter.
- Foxboro Models N-E11DM, N-E13DM, and E13DM.
- Weed Model N-E11GM.

The TR includes the following recommendations for actions to ensure sensors are operating correctly and that calibration or other surveillance will provide an accurate indication that the dynamic characteristics of the instrument will be accurately reflected in a static calibration.

1. Perform a hydraulic RTT prior to installation of a new transmitter/switch or following refurbishment of the transmitter/switch (e.g., sensor cell or variable damping components) to determine an initial sensor-specific response time value. The power interrupt test is an alternate method to use on force-balance transmitters; the purpose of this test is to verify sensor response time is within the limits of the allocated value for the transmitter function.

2. For transmitters and switches that use capillary tubes, RTT should be performed after initial installation and after any maintenance or modification activity that could damage the capillary tubes.

3. Perform periodic drift monitoring on all Rosemount pressure and differential pressure transmitters, models 1151, 1152, 1153, and 1154. Guidance on drift monitoring can be found in EPRI [Electric Power Research Institute] NP-7121 and Rosemount Technical Bulletins. Drift monitoring intervals should be based on utility response to NRC Bulletin 90-01.

4. If variable damping is used, implement a method to ensure that the potentiometer is at the required setting and cannot be inadvertently changed. This approach should eliminate the need for RTT to detect a variable damping failure mode. Otherwise, RTT each transmitter by hydraulic or electronic white noise analysis methods, at a minimum, following each transmitter calibration.

In letter dated December 5, 2000, the NRC staff issued its Safety Evaluation (SE) on CE NPSD-1167, Revision 2. In that SE, the NRC staff stated (1) that, based on Revision 2 of the TR and its recommendations, RTT is not required for sensors and systems specified in the report to demonstrate satisfactory sensor performance, and that other routine surveillance, such as calibrations and drift monitoring, are sufficient to demonstrate satisfactory sensor performance; and (2) that Revision 2 to CE NPSD-1167, as modified by the CEOG letter dated June 6, 2000, is acceptable as a basis for eliminating RTT from TSs for the sensors and systems identified in the report.

An acceptable set of TSs to implement the elimination of RTT based on Revision 2 of CE NPSD-1167 is given in NRC/Nuclear Energy Institute (NEI) TS Task Force (TSTF) traveler TSTF-368, which was approved by the NRC in its letter to NEI dated January 25, 2001. TSTF-368 approves changes to the improved Standard Technical Specifications, NUREG-1432, “Standard Technical Specifications Combustion Engineering,” Revision 1, dated April 1995, based on CE NPSD-1167.

3.0 EVALUATION

The amendment would revise the definition of RTT for ESFAS and the RPS in that the following statement would be added to TS Definitions 1.12 and 1.25: "The response time may be measured by any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of measurement, response time may be verified for selected components provided that the components and methodology for verification have been previously reviewed and approved by the NRC.”

In its application, the licensee stated that as an alternative to the current method of determining response time, in which a measured sensor response time is obtained, the proposed amendment of the definition would allow substitution of an allocated sensor response time. The sensor response time (measured or allocated) is used in determining that the overall system response time is within the TS limits. The allocated response time would be obtained from the sensor manufacturer or derived from the plant data obtained from previous RTT.

In its application, the licensee addressed the recommendations listed above. The licensee’s responses to the recommendations are given below:

1. Perform a hydraulic RTT prior to installation of a new transmitter/switch or following refurbishment of the transmitter/switch (e.g., sensor cell or variable damping components) to determine an initial sensor-specific response time

value. The power interrupt test is an alternate method to use on force-balance transmitters; the purpose of this test is to verify sensor response time is within the limits of the allocated value for the transmitter function.

Entergy Position: Entergy performs pre-installation RTT. The testing is performed under procedure MI-013-520, "Pressure Sensor Pre-Installation Response Time Test." The test utilizes a hydraulic ramp generator and a Teledyne reference transducer. A ramp test is performed in the direction of use (i.e., from high to low pressure for a low trip and low to high for a high trip).

2. For transmitters and switches that use capillary tubes, RTT should be performed after initial installation and after any maintenance of modification activity that could damage the capillary tubes.

   Entergy Position: The Entergy configuration does not include any Rosemount transmitters with capillary tubes in these RPS or ESFAS applications. All of the pressure transmitters in these applications are connected to the process piping using 1/2 in[ch] OD [outside diameter] SS [stainless steel] 316 tubing.

3. Perform periodic drift monitoring on all Rosemount pressure and differential pressure transmitters, models 1151, 1152, 1153, and 1154. Guidance on drift monitoring can be found in EPRI NP-7121 and Rosemount Technical Bulletins. Drift monitoring intervals should be based on utility response to NRC Bulletin 90-01.

   Entergy Position: On March 9, 1990, the NRC issued NRC Bulletin 90-01, "Loss of Fill-Oil in Transmitters Manufactured by Rosemount," and on December 22, 1992, issued Supplement 1 to this bulletin. Entergy provided responses to the NRC, in letters W3P90-1153, dated July 17, 1990, W3F193-0004 dated February 25, 1993, respectively. In the responses, it was noted that Waterford 3 does not include any of the Rosemount transmitters models 1151, 1152, 1153, and 1154, in these RPS/ESFAS applications.

   Entergy concluded then that the bulletin requirement for an enhanced surveillance program was not applicable to its facility.

4. If variable damping is used, implement a method to ensure that the potentiometer is at the required setting and cannot be inadvertently changed. This approach should eliminate the need for RTT to detect a variable damping failure mode. Otherwise, RTT each transmitter by hydraulic or electronic white noise analysis methods, at a minimum, following each transmitter calibration.

   Entergy Response: The Waterford 3 configuration does not include any RPS/ESFAS transmitters with the variable damping feature.

Based on its review of the Licensee's responses Entergy Positions to the above recommendations, the NRC staff concludes that the licensee has acceptably addressed the recommendations.

The NRC staff also reviewed the licensee's proposed changes to the Bases of the TSs. The proposed changes to the Bases shown in the application are consistent with the NRC staff's SE for CE NPSD-1167, Revision 2, and TSTF-368.

Additionally, under Reactor Trip Breaker header, a paragraph discussing similar details of NPSD-1167 for response time testing is deleted. The staff finds this acceptable.

In summary, the sensors, for which Entergy has requested elimination of RTT at Waterford 3, have all been analyzed in EPRI Report NP-7243, "Investigation of Response Time Testing Requirements." In each case, the response time values have been determined by the sensor manufacturer. The staff has reviewed these systems and the applications in which sensors are used, and finds that these sensors and systems are appropriate for RTT elimination. The specific sensors and systems for which RTT elimination was requested are contained in Table 3.2-4 of CEOG Topical Report NPSD-1167 and Table 1 of this SE.

4.0 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.

5.0 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 (66 FR 46479, dated September 5, 2001). 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.

6.0 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 Contributor: N. Kalyanam

Date: October 29, 2001

Table 1

Waterford 3 Transmitters

Instrument Description	Loop Number	Manufacturer Make/Model	Allocated Response Time
Reactor Coolant System Low Flow	SG IDPT9116 SG IDPT9126	Barton Model 764	0.180 seconds
Containment Pressure - Narrow Range	CB IPT6701	Rosemount Model 1153 Range Code 6	0.200 seconds
Containment Pressure - Wide Range	CB IPT6702	Rosemount Model 1153 Range Code 6	0.200 seconds
Steam Generator 1 - Level	SG ILT1113	Rosemount Model 1154 Range Code 4	0.500 seconds
Steam Generator 2 - Level	SG ILT1123	Rosemount Model 1154 Range Code 4	0.500 seconds
Steam Generator 1 - Pressure	SG IPT1013	Rosemount Model 1154 Range Code 9	0.200 seconds
Steam Generator 2 - Pressure	SG IPT1023	Rosemount Model 1154 Range Code 9	0.200 seconds
Pressurizer Pressure - Narrow Range	RC IPT0101	Rosemount Model 1154 Range Code 9	0.200 seconds
Pressurizer Pressure - Wide Range	RC IPT0102	Rosemount Model 1154 Range Code 9	0.200 seconds
Refueling Water Tank Level	SI ILT0305	Rosemount Model 1152 Range Code 5	0.200 sec