



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

January 31, 2011

Vice President, Operations
Entergy Operations, Inc.
Waterford Steam Electric Station, Unit 3
17265 River Road
Killona, LA 70057-3093

SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 - ISSUANCE OF
AMENDMENT RE: PROPOSED CHANGE TO TECHNICAL SPECIFICATION
3.7.1.2, "EMERGENCY FEEDWATER SYSTEM" (TAC NO. ME4286)

Dear Sir or Madam:

The Commission has issued the enclosed Amendment No. 230 to Facility Operating License No. NPF-38 for the Waterford Steam Electric Station, Unit 3. This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated July 20, 2010.

The amendment revises TS 3.7.1.2, "Emergency Feedwater System," Limiting Condition for Operation (LCO) 3/4.7.1.2, "Emergency Feedwater," to clarify the acceptability of transitioning from Mode 4, Hot Shutdown, to Mode 3, Hot Standby, with the turbine-driven emergency feedwater (EFW) pump inoperable but available. The amendment grants an exception to TS LCO 3.0.4 and Surveillance Requirement 4.0.4 allowing entry into operational Mode 3 with TS LCO equipment, the turbine-driven EFW pump, associated with a shutdown action inoperable.

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,

A handwritten signature in black ink, appearing to read "N. Kalyanam", with a horizontal line underneath.

N. Kalyanam, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosures:

1. Amendment No. 230 to NPF-38
2. Safety Evaluation

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

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-382

WATERFORD STEAM ELECTRIC STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 230
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 July 20, 2010, 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.

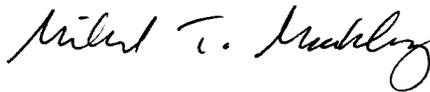
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 2.C.2 of Facility Operating License No. NPF-38 is hereby amended to read as follows:

2. Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 230, 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



Michael T. Markley, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Facility Operating
License No. NPF-38 and
Technical Specifications

Date of Issuance: January 31, 2011

ATTACHMENT TO LICENSE AMENDMENT NO. 230

TO FACILITY OPERATING LICENSE NO. NPF-38

DOCKET NO. 50-382

Replace the following pages of the Facility Operating License and 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.

Facility Operating License

REMOVE

INSERT

-4-

-4-

Technical Specifications

REMOVE

INSERT

3/4 7-4

3/4 7-4

or indirectly any control over (i) the facility, (ii) power or energy produced by the facility, or (iii) the licensees of the facility. Further, any rights acquired under this authorization may be exercised only in compliance with and subject to the requirements and restrictions of this operating license, the Atomic Energy Act of 1954, as amended, and the NRC's regulations. For purposes of this condition, the limitations of 10 CFR 50.81, as now in effect and as they may be subsequently amended, are fully applicable to the equity investors and any successors in interest to the equity investors, as long as the license for the facility remains in effect.

- (b) Entergy Louisiana, LLC (or its designee) to notify the NRC in writing prior to any change in (i) the terms or conditions of any lease agreements executed as part of the above authorized financial transactions, (ii) any facility operating agreement involving a licensee that is in effect now or will be in effect in the future, or (iii) the existing property insurance coverages for the facility, that would materially alter the representations and conditions, set forth in the staff's Safety Evaluation enclosed to the NRC letter dated September 18, 1989. In addition, Entergy Louisiana, LLC or its designee is required to notify the NRC of any action by equity investors or successors in interest to Entergy Louisiana, LLC that may have an effect on the operation of the facility.
- C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:
 - 1. Maximum Power Level

EOI is authorized to operate the facility at reactor core power levels not in excess of 3716 megawatts thermal (100% power) in accordance with the conditions specified herein.
 - 2. Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 230, 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.

PLANT SYSTEMS

EMERGENCY FEEDWATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.1.2 Three emergency feedwater (EFW) pumps and two flow paths shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

- a. With one steam supply to the turbine-driven EFW pump inoperable, restore the steam supply to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- b. With one steam supply to the turbine-driven EFW pump and one motor-driven EFW pump inoperable and the EFW flow paths able to deliver at least 100% flow to their respective steam generators, restore the steam supply or motor-driven EFW pump to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- c. With one steam supply to the turbine-driven EFW pump and both motor-driven EFW pumps inoperable and the EFW flow paths able to deliver at least 100% flow to their respective steam generators, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- d. With the EFW system inoperable for reasons other than those described in ACTION (a), (b), or (c), and able to deliver at least 100% flow to either steam generator, restore the EFW system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- e. With the EFW system inoperable for reasons other than those described in ACTION (a), (b), or (c), and able to deliver at least 100% combined flow to the steam generators, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- f. With the EFW system inoperable and unable to deliver at least 100% combined flow to the steam generators, immediately initiate action to restore the ability to deliver at least 100% combined flow to the steam generators. LCO 3.0.3 and all other LCO ACTIONS requiring MODE changes are suspended until the EFW system is capable of delivering at least 100% combined flow to the steam generators.
- g. Only as allowed by Surveillance Requirements 4.7.1.2(b) and 4.7.1.2(c), the provisions of Specifications 3.0.4 and 4.0.4 are not applicable to the turbine-driven EFW pump for entry into Mode 3.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 230 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 July 20, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML102030254), Entergy Operations, Inc. (the licensee), requested changes to the Technical Specifications (TSs) for Waterford Steam Electric Station, Unit 3 (Waterford 3).

The proposed changes would revise TS 3.7.1.2, "Emergency Feedwater System," Limiting Condition for Operation (LCO) 3/4.7.1.2, "Emergency Feedwater," to clarify the acceptability of transitioning from Mode 4, Hot Shutdown, to Mode 3, Hot Standby, with the turbine-driven emergency feedwater (EFW) pump inoperable but available. The proposed amendment would grant an exception to TS LCO 3.0.4 and Surveillance Requirement (SR) 4.0.4 allowing entry into operational Mode 3 with TS LCO equipment, the turbine-driven EFW pump, associated with a shutdown action inoperable.

The intent of the license amendment request (LAR) is to eliminate confusion associated with turbine-driven EFW pump not having fully demonstrated operability with performance of SRs prior to entry into Mode 3 when equipment is required to be operable.

2.0 REGULATORY EVALUATION

2.1 System Description

In its letter dated July 20, 2010, the licensee stated:

The EFW system automatically supplies feedwater to the steam generators to remove heat from the Reactor Coolant System (RCS) upon loss of the normal feedwater supply. The EFW pumps take suction from a common suction header, which is supplied by two separate and independent lines from the condensate

storage pool, and discharge to a common discharge header. From the common discharge header, EFW is supplied to the secondary side of the steam generator via separate and independent connections to the main feedwater piping outside containment. The steam generators function as a heat sink for core decay heat, reactor coolant pump heat, and other residual heat. The heat load is dissipated by releasing steam to the atmosphere from the steam generators via the main steam safety valves or atmospheric dump valves. If the main condenser is available, steam may be released via the steam bypass valves.

The EFW system consists of two (50% capacity) motor-driven pumps, one (100% capacity) steam turbine-driven pump, and two diverse flow paths. One flow path supplies steam generator 1 and the second flow path supplies steam generator 2. A flow path consists of piping, valves, and components from the common pump discharge header through two parallel legs to the respective steam generator. Each parallel leg contains a flow control valve and an isolation valve in series. Either of the two parallel legs in a steam generator flow path is capable of supplying 100% of the flow required for the heat removal safety function. One flow path supplying one steam generator is capable of cooling the unit to shutdown cooling entry conditions. Two independent suction paths exist between the Condensate Storage Pool (CSP) and the EFW common pump suction header. Each suction path alone can supply enough flow to assure sufficient net positive suction head for all three EFW pumps.

The turbine-driven EFW pump supplies the common discharge header that is connected to each steam generator flow path. The turbine-driven EFW pump is capable of feeding either steam generator.

The EFW System is actuated automatically by the Engineered Safety Features Actuation System Instrumentation - Functional Unit Emergency Feedwater (EFAS). The EFAS logic is designed to feed either or both steam generators with low levels. The Main Steam Isolation System (MSIS) in conjunction with EFAS will isolate the EFW System from a steam generator having a significantly lower steam pressure than the other steam generator to ensure EFW is supplied only to an intact steam generator. The EFAS automatically actuates the EFW pumps and associated valves and controls when required to ensure an adequate feedwater supply to the steam generators.

2.2 Regulatory Requirements

Section 182a of the Atomic Energy Act requires applicants for nuclear power plant operating licenses to include TSs as part of the license. The Commission's regulatory requirements related to the content of the TSs are contained in Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.36, "Technical specifications." The TS requirements in 10 CFR 50.36 include the following categories: (1) safety limits, limiting safety systems settings, and control settings, (2) LCOs, (3) SRs, (4) design features, and (5) administrative controls. The regulations in 10 CFR 50.36(c)(2)(i) state that LCOs are the "lowest functional capability or performance levels of equipment required for safe operations of the facility."

The regulations in 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 34, "Residual heat removal," require that,

A system to remove residual heat shall be provided. The system safety function shall be to transfer fission product decay heat and other residual heat from the reactor core at a rate such that specified acceptable fuel design limits and the design conditions of the reactor coolant pressure boundary are not exceeded.

Suitable redundancy in components and features, and suitable interconnections, leak detection and isolation capabilities shall be provided to assure that for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system (assuming onsite power is not available) the system safety function can be accomplished, assuming a single failure.

The regulations in 10 CFR 50.63, "Loss of all alternating current power," require a power plant to "withstand for a specified duration and recover from a station blackout."

NUREG-1432, Revision 3, "Standard Technical Specifications, Combustion Engineering Plants," provides standardized guidance, including format and content, for improvement of TSs for Combustion Engineering Power Plants.

2.3 Precedence

In its letter dated July 20, 2010, the licensee cited the following precedence:

In [Reference¹], the NRC issued an amendment to South Texas Project clarifying that the provision of TS LCO 3.0.4 are not applicable for entry into Mode 3 for the turbine driven Auxiliary Feedwater (equivalent to Emergency Feedwater) pump.

3.0 TECHNICAL EVALUATION

3.1 Proposed TS Changes

Proposed TS LCO 3.7.1.2 would provide an exception to TS LCO 3.0.4 to align with the quarterly inservice testing (IST) and the 18-month EFAS SR for the turbine-driven EFW pump by adding new Action g. as follows:

- g. Only as allowed by Surveillance Requirements 4.7.1.2 (b) and 4.7.1.2 (c), the provisions of Specifications 3.0.4 and 4.0.4 are not applicable to the turbine-driven EFW pump for entry into Mode 3.

¹ Alexion, T. W., U.S. Nuclear Regulatory Commission, letter to W. T. Cottle, Houston Lighting & Power Company, "South Texas Project, Units 1 and 2 – Amendment Nos. 87 and 74 to Facility Operating License Nos. NPF-76 and NPF-80 (TAC Nos. M96338 and M96339)," dated May 27, 1997 (ADAMS Accession No. ML021300488).

3.2 NRC Staff Evaluation

As stated in the LAR, the request does not involve any physical changes to plant systems, structures, and components. The proposed change allows the licensee to take the plant into Mode 3 without completing IST and the EFAS SR test until the suitable conditions are achieved. In its letter dated July 20, 2010, the licensee provided the following operational and technical justification:

When sufficient steam pressure on the secondary side of the steam generators to perform the dynamic final calibration of the governor valve speed control unit of the turbine-driven EFW pump is reached, the plant completes this activity and then completes IST and EFAS SR. Per the allowed delay for the turbine-driven EFW pump, there are 24 hours (after exceeding 750 psig [pounds per square inch gauge] in both steam generators) to complete the IST and EFAS SR. Until the turbine-driven EFW pump is declared operable, the plant is an action statement for the turbine-driven EFW pump being inoperable, thus the plant is not allowed to have the turbine driven EFW pump inoperable in Mode 3 beyond time as allowed in the EFW System action statement.

In its letter dated July 20, 2010, the licensee described that either of the two parallel legs in a steam generator flow path is capable of supplying 100 percent of the flow required for the heat removal safety function, with one flow path supplying one steam generator as capable of cooling the unit to shutdown cooling entry conditions. The flow paths contain direct current powered, pneumatic, flow control and isolation valves to provide flow to the appropriate steam generator, actuated by the EFAS. Each parallel leg contains a flow control valve and an isolation valve in series. These valves are fail-open pneumatic valves. One train is considered to be two 50 percent motor-driven EFW pumps and one flow path. A separate train is considered to be one 100 percent turbine-driven EFW pump and one flow path. This makes up the two separate trains that function as the EFW system at Waterford 3.

Waterford 3 TS 3.0.4 states:

Entry into an OPERATIONAL MODE or other specified condition shall not be made when the conditions for the Limiting Conditions for Operation are not met...

The licensee proposes to modify TS 3.7.1.2, "Emergency Feedwater System," by adding an exception to entering TS LCO 3.0.4, to allow the plant to enter Mode 3 with an inoperable turbine-driven EFW pump in order to perform testing to prove operability. This provision is necessary because of inadequate steam pressure in Mode 4 to perform adequate testing. Therefore, a provision is needed during plant startup to allow the plant to enter Mode 3 in order to establish suitable conditions for testing. An allowance to enter Mode 3 with an inoperable turbine-driven EFW has been evaluated by the NRC staff using regulatory guidance provided in NUREG-1432.

When entering Mode 3 out of a refueling outage, only a single train of EFW is operable. That train consists of two motor-driven pumps, each 50 percent capacity, to meet flow requirements for mitigating design-basis accidents (DBAs). The turbine-driven EFW pump cannot be demonstrated fully operable prior to entry into Mode 3 due to lack of steam pressure in the

steam generators to conduct the IST to declare the turbine-driven EFW pump fully operable. The licensee describes in its letter dated July 20, 2010, that prior to entry into Mode 2 during plant startup, TS SR 4.7.1.2(d) (testing of various combinations of EFW pumps and valves) is performed to ensure all required EFW system flow paths and equipment are demonstrated operable before the reactor is taken critical and significant heat is generated. The licensee has added an insert in the TS Bases that the proposed exception is only applicable when the plant is entering Mode 3 from a refueling outage.

The NRC staff review of the DBA scenarios in the proposed configuration has determined that the licensee is capable of mitigating all the DBAs, without incurring a single failure, except for a station blackout (SBO). The licensee credits the turbine-driven EFW pump to comply with 10 CFR 50.63 in withstanding an SBO accident scenario. Current TS 3.7.1.2(d) allows the licensee to continue operations in Modes 1, 2, and 3 for 72 hours with an inoperable turbine-driven EFW pump. The proposed amendment is only requesting operations in Mode 3 for 24 hours to test the turbine-driven EFW pump for operability. The licensee's proposed 24 hours is well within the 72 hours normally allowed for a turbine-driven EFW pump out of service. Also, taking into consideration the low likelihood that an SBO would occur during that time and the low amount of residual heat present in the RCS, the NRC staff concludes that the proposed 24-hour time frame for unavailability of a turbine-driven EFW pump while transitioning into Mode 3 is acceptable.

The NRC staff compared the licensee's proposed TS with the guidance provided in NUREG-1432, Section 3.7.5, "Auxiliary Feedwater System," which also specifies a 72-hour completion time when one train of EFW is inoperable to restore the turbine-driven pump to operable status in Modes 1, 2, and 3. Furthermore, while in Mode 3 with the turbine-driven pump inoperable but available, NUREG-1432 permits a time period of 24 hours after reaching 750 psig to establish suitable conditions to test the EFW pump. Therefore, the NRC staff concludes that the licensee's proposed change complies with the guidance specified in NUREG-1432 and is, therefore, acceptable. With respect to IST time period requirements, the NRC staff concludes that the licensee's proposed 24 hours to test the turbine-driven EFW pump after reaching 750 psig aligns with SR 3.7.2.5 in NUREG-1432 and is, therefore, acceptable.

The NRC staff evaluated the licensee's stated precedence and concludes that it is not applicable, other than the mode change is necessary to complete the operability test. The differences in the two EFW systems were such that precedence was not established. Notwithstanding the disparity with the precedence cited by the licensee, the NRC concludes that the plant-specific request is acceptable.

The regulations in 10 CFR 50.36(c)(2) require an LCO be established for the lowest functional capability or performance levels of equipment required for safe operation of the facility. The licensee proposes to add a TS provision allowing the turbine-driven EFW pump to be inoperable for 24 hours while entering Mode 3 for testing. The NRC staff concludes that the proposed provision satisfies the requirements of 10 CFR 50.36(c)(2)(i) and is, therefore, acceptable.

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 published in the *Federal Register* on September 21, 2010 (75 FR 57523). 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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: Ogbonna L. Hopkins

Date: January 31, 2011

January 31, 2011

Vice President, Operations
Entergy Operations, Inc.
Waterford Steam Electric Station, Unit 3
17265 River Road
Killona, LA 70057-3093

SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 - ISSUANCE OF
AMENDMENT RE: PROPOSED CHANGE TO TECHNICAL SPECIFICATION
3.7.1.2, "EMERGENCY FEEDWATER SYSTEM" (TAC NO. ME4286)

Dear Sir or Madam:

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Sincerely,
/RA/

N. Kalyanam, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosures:

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- 2. Safety Evaluation

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ADAMS Accession No. ML103630522

*SE memo dated 12/13/10, as revised by SE memo dated 1/26/11

OFFICE	NRR/LPL4/PM	NRR/LPL4/LA	NRR/DCI//ITSB/BC	NRR/DSS/SRXB/BC	NRR/DE/EEEB/BC (A)
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DATE	1/11/11	1/28/11	1/11/11	1/12/11	1/31/11
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