

March 27, 2008

Mr. Gene St. Pierre, Site Vice President
c/o James M. Peschel
Seabrook Station
FPL Energy Seabrook, LLC
PO Box 300
Seabrook, NH 03874

SUBJECT: SEABROOK STATION, UNIT NO. 1 – ISSUANCE OF AMENDMENT RE:
SETPOINT CHANGE FOR REACTOR TRIP SYSTEM INTERLOCK P-9
(TAC NO. MD5110)

Dear Mr. St. Pierre:

The Commission has issued the enclosed Amendment No. 117 to Facility Operating License No. NPF-86 for the Seabrook Station, Unit No. 1 (Seabrook), in response to your application dated March 29, 2007, as supplemented by letter dated January 9, 2008.

The amendment revises the Seabrook Technical Specifications to increase the power level required for a reactor trip following a turbine trip from 20 percent of rated thermal power (RTP) to 45 percent of RTP.

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

Sincerely,

/ra/

G. Edward Miller, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-443

Enclosures:

1. Amendment No. 117 to NPF-86
2. Safety Evaluation

cc w/encls: See next page

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DATE	3/18/08	3/5/2008	2/5/2008	3/13/08	3/27/08

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Seabrook Station, Unit No. 1

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FPL ENERGY SEABROOK, LLC, ET AL.*

DOCKET NO. 50-443

SEABROOK STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 117
License No. NPF-86

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment filed by FPL Energy Seabrook, LLC, et al. (the licensee), dated March 29, 2007, as supplemented by letter dated January 9, 2008, 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.

* FPL Energy Seabrook, LLC (FPLE Seabrook) is authorized to act as agent for the: Hudson Light & Power Department, Massachusetts Municipal Wholesale Electric Company, and Taunton Municipal Light Plant and has exclusive responsibility and control over the physical construction, operation and maintenance of the facility.

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-86 is hereby amended to read as follows:

- (2) Technical Specifications

- The Technical Specifications contained in Appendix A, as revised through Amendment No. 117, 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 90 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/ra/

Harold K. Chernoff, Chief
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment: Changes to the License and
Technical Specifications

Date of Issuance: March 27, 2008

ATTACHMENT TO LICENSE AMENDMENT NO. 117

FACILITY OPERATING LICENSE NO. NPF-86

DOCKET NO. 50-443

Replace the following page of Facility Operating License No. NPF-86 with the attached revised page as indicated. The revised page is identified by amendment number and contains marginal lines indicating the area of change.

Remove
3

Insert
3

Replace the following page of the Appendix A, Technical Specifications, with the attached revised page as indicated. The revised page is identified by amendment number and contains marginal lines indicating the area of change.

Remove
2-6

Insert
2-6

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 117 TO FACILITY OPERATING LICENSE NO. NPF-86

FPL ENERGY SEABROOK, LLC
SEABROOK STATION, UNIT NO. 1

DOCKET NO. 50-443

1.0 INTRODUCTION

By letter dated March 29, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML070920139), as supplemented by letter dated January 9, 2008 (ADAMS Accession No. ML080170491), FPL Energy Seabrook, LLC (FPLE or the licensee) submitted License Amendment Request No. 07-01, requesting changes to the Technical Specifications (TSs) for Seabrook Station, Unit No. 1 (Seabrook). The NRC staff's original proposed no significant hazards consideration determination was published in the *Federal Register* on July 31, 2007 (72 FR 41785).

The amendment would revise the Seabrook TSs to increase the setpoint for the P-9 interlock from 20 percent of rated thermal power (RTP) to 45 percent of RTP. The P-9 interlock enables the automatic reactor trip logic to trip the reactor upon receipt of a turbine trip signal when the reactor is operating at power levels greater than the P-9 setpoint. The licensee expects that the proposed change would decrease unnecessary challenges to the reactor protection system (RPS) and increase plant availability while maintaining the safe operation of the plant.

2.0 REGULATORY EVALUATION

The P-9 interlock blocks a reactor trip system trip signal following a turbine trip, provided the turbine trip occurs when the plant is operating at a relatively low power level (i.e., below the P-9 setpoint).

Turbine trips are initiated to protect the turbine and tend to dampen the resulting transient in the reactor coolant system. No credit, however, is taken in the safety analyses (Chapter 15 of the Seabrook Updated Final Safety Analysis Report) for any reactor trips that are derived directly from any of the turbine trip signals. This is because such reactor trip signals are considered less reliable than reactor trip signals that originate in the reactor protection system since the turbine building is not seismically qualified.

The P-9 interlock ceases to prevent the automatic block function of an RPS trip signal, following a turbine trip, when reactor power increases above the P-9 interlock setpoint in at least 2 out of 4 neutron power range flux channels. The requirements that pertain to the P-9 interlock are included in TS 3/4.3.1, "Reactor Trip System Instrumentation," and TS 2.2.1, "Reactor Trip System Instrumentation Setpoints." Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36(c)(2)(ii)(C), Criterion 3, applies to the reactor trip system instrumentation which is,

ENCLOSURE

“a structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.” Specifically, the automatic reactor trip function, when demanded by a turbine trip, serves to limit the power generation/heat sink mismatch that can be caused by a turbine trip. Limiting these parameters tends to limit the resulting pressurization of the reactor coolant system (RCS), and thereby reduce the potential challenge to the fission product barrier that is provided by the primary coolant system pressure boundary.

The P-9 interlock is provided because it is not necessary to trip the reactor at relatively low power levels. FPLE also evaluated the proposed modification with respect to the probability of a stuck-open power-operated relief valve (PORV), as specified in Item II.K.3.10 of NUREG-0737, “Clarification of [Three Mile Island (TMI)] Action Plan Requirements.” Item II.K.3.10 concerns the effect of certain anticipatory trip modifications upon the probability of a small-break loss-of-coolant accident (LOCA) resulting from a stuck-open PORV.

Additionally, 10 CFR 50.62, “Requirements for reduction of risk from anticipated transients without scram (ATWS) events for light-water-cooled nuclear power plants,” requires that each pressurized water reactor must have equipment from sensor output to final actuation device, that is diverse from the reactor trip system, to automatically initiate the auxiliary (or emergency) feedwater system and initiate a turbine trip under conditions indicative of an ATWS. This equipment must be designed to perform its function in a reliable manner and be independent (from sensor output to the final actuation device) from the existing reactor trip system.

3.0 TECHNICAL EVALUATION

Westinghouse plants, such as Seabrook, are equipped with steam turbine bypass systems that are capable of dumping up to 40 percent of full load steam flow directly to the condenser. These plants can also tolerate a load rejection of up to 10 percent without requiring a reactor trip. Therefore, a step load decrease of up to 50 percent of full load can be handled without leading to a reactor trip. This means that when the plant is operating below 50 percent of RTP, a total load rejection (e.g., a turbine trip) should not require a reactor trip.

However, since a turbine trip is considered an anticipated operational occurrence (AOO), it must not be allowed to escalate into a postulated accident. If the turbine trip AOO causes the RCS to pressurize to the PORV opening setpoint, then the PORV must be shown to reseal completely in order to demonstrate that the AOO has not developed into a postulated accident (i.e., a small-break LOCA).

FPLE, in order to demonstrate that there is a minimal possibility of a stuck-open PORV and therefore a minimal possibility of a small-break LOCA, provided a best-estimate analysis to show that no PORVs would be called upon to open during a turbine trip at 45 percent of RTP. The analysis provided by FPLE, using NRC-approved methods, indicated that a turbine trip from 45 percent of RTP would result in transient pressurization of the RCS below 2304 psia. The maximum analytical pressure is almost 100 psi below the PORV opening setpoint of 2400 psia. Therefore, the NRC staff finds that FPLE has adequately addressed Item II.K.3.10 of NUREG-0737.

FPLE also analyzed a series of cases, at various power levels, based upon more conservative assumptions (e.g., with degraded or unavailable control systems). These analyses, although not required to address the NRC staff’s TMI Action Plan Requirement, add some perspective to

the plant's response to a variety of partial load rejections. The case where steam dumping to the condenser was not allowed resulted in opening of the steam generator safety valves and the pressurizer PORVs. The licensee's analysis showed that although the pressurizer relief valves would open, the pressurizer would not become water-solid, and therefore would not result in water relief through either the PORVs or safety valves. Preventing water from passing through the valves maintains a high likelihood that the valves would re-seat following the transient, thus preventing the AOO from developing into a postulated accident.

FPLE also verified that the power level would have to be as low as 20% in order to yield a transient that would not result in opening of the pressurizer PORVs or the steam generator safety valves. This agrees with the plants inherent ability to deal with a 10% load rejection and the atmospheric steam dumping capacity to remove the other 10% of steam flow.

In its January 9, 2008, supplement, the licensee provided additional information pertaining to ATWS events at power levels below 45 percent of RTP. In order to protect against ATWS events, and to comply with the ATWS Rule (10 CFR 50.62), Seabrook is equipped with an ATWS mitigation system (AMS). In the event of an ATWS, the AMS automatically trips the turbine, and actuates emergency feedwater (EFW) flow, independent of the reactor protection system. AMS is armed to operate at power levels of 20 percent RTP or greater, as indicated by turbine impulse pressure. FPLE indicated that raising the P-9 setpoint would enable the plant to operate without the turbine in service at power levels of up to 45 percent of RTP. Since the AMS relies upon turbine impulse pressure for arming, the AMS would not be armed and available to automatically initiate EFW flow when the turbine is not in service at power levels of 45 percent RTP and below.

FPLE compared the results of an ATWS at 45 percent of RTP, without automatic initiation of EFW, to the limiting case of an ATWS at full power. Neither case was predicted to pressurize the RCS to unacceptable pressures (i.e., greater than 3200 psig). Without EFW flow, however, an ATWS event at 45 percent or RTP could produce some voiding in the RCS, and possibly uncover the core. The licensee noted that a Westinghouse study (Technical Bulletin ESBU-TB-97-08) showed that such voiding was not greater than the voiding predicted for the limiting, 100 percent of RTP ATWS, case. It also showed that the RCS inventory, 10 minutes after the ATWS event occurs, is more than the amount needed to cover the core. Therefore, no core damage would be expected to result from voiding in the RCS during an ATWS event at or below 45 percent of RTP. The NRC staff agrees with these conclusions, since they are consistent with the results of ATWS investigations in other, similarly designed, Westinghouse plants, with comparable decay heat removal and pressure-relieving capabilities. The licensee has shown that the limiting ATWS case, at full power, would still be the limiting case after the P-9 setpoint increase is implemented.

Based on the above evaluation, the NRC staff finds that the increase of the P-9 setpoint from 20 percent of RTP to 45 percent of RTP would continue to meet the requirements of 10 CFR 50.36, 10 CFR 50.62, and Item II.K.3.10 of NUREG-0737.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New Hampshire and Massachusetts State officials were notified of the proposed issuance of the amendment. The State officials 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 (72 FR 41785). 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 Contributors: S. Miranda

Date: March 27, 2008