

December 8, 2004

Mr. Mark E. Warner, Site Vice President  
c/o James M. Peschel  
Seabrook Station  
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Seabrook, NH 03874

SUBJECT: SEABROOK STATION, UNIT NO. 1 - ENVIRONMENTAL ASSESSMENT AND  
FINDING OF NO SIGNIFICANT IMPACT - POWER UPRATE MODIFICATION  
(TAC NO. MC2364)

Dear Mr. Warner:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your application for an amendment to permit uprated power operations at Seabrook Station, Unit No. 1 (Seabrook) dated March 17, 2004, as supplemented by a second letter dated March 17, 2004, and letters dated April 1, May 26, September 13 (two letters), and October 12, 2004. The proposed amendment would increase the licensed reactor power from 3411 megawatts thermal (MWt) to 3587 MWt at Seabrook, an approximate 5.2 percent increase.

The Environmental Assessment is being forwarded to the Office of the Federal Register for publication.

Sincerely,

*/RA/*

Victor Nerses, Senior Project Manager, Section 2  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-443

Enclosure: As stated

cc w/encl: See next page

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UNITED STATES NUCLEAR REGULATORY COMMISSION

FPL ENERGY SEABROOK, LLC

DOCKET NO. 50-443

SEABROOK STATION, UNIT NO. 1

ENVIRONMENTAL ASSESSMENT AND  
FINDING OF NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (NRC) is considering issuance of an amendment to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.90 for Facility Operating License No. NPF-86, issued to FPL Energy Seabrook, LLC (FPLE Seabrook or the licensee), for operation of the Seabrook Station, Unit No. 1 (Seabrook), located in Seabrook Township, Rockingham County, New Hampshire. Therefore, as required by 10 CFR 51.21, the NRC is issuing this environmental assessment and finding of no significant impact.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action:

The proposed action would allow FPLE Seabrook to increase the maximum reactor core power level from 3411 megawatts thermal (MWt) to 3587 MWt, which is an increase of approximately 5.2 percent of the rated core thermal power for Seabrook.

The proposed action is in accordance with the licensee's application dated March 17, 2004, as supplemented by a second letter dated March 17, 2004, and letters dated April 1, May 26, September 13 (two letters), and October 12, 2004.

The Need for the Proposed Action:

The proposed action permits an increase in the licensed core thermal power from 3411 MWt to 3587 MWt for Seabrook and provides the flexibility to increase the potential electrical output of Seabrook.

Environmental Impacts of the Proposed Action:

This assessment summarizes the non-radiological and radiological impacts on the environment that may result from the proposed action. The NRC staff based its conclusions on an analyzed core power level of 3659 MWt (3678 MWt Nuclear Steam Supply System (NSSS) power level). A power level of 3659 MWt is used based on the guaranteed core thermal output of 3587 MWt plus a 2-percent uncertainty allowance for calorimetric measurements.

Radiological Environmental Assessment:

Radwaste Systems:

Seabrook uses waste treatment systems designed to maintain normal operation offsite releases and doses within the requirements of 10 CFR Part 20 and 10 CFR Part 50, Appendix I. Regulatory guidance relative to the methodology used to determine if the radwaste effluent releases from a pressurized-water reactor meet the requirements of 10 CFR Part 20 and 10 CFR Part 50, Appendix I is provided in NUREG-0017, Revision 1, "Calculation of Releases of Radioactive Materials in Gaseous and Liquid Effluents from Pressurized Water Reactors (PWR-GALE Code)." The proposed power uprate will not change existing radioactive waste system design, plant operating procedures, or waste inputs as defined by NUREG-0017. As a result, the impact of the proposed power uprate on radwaste releases and Appendix I doses can be estimated using the methodology and equations found in NUREG-0017, Revision 1.

The reactor coolant contains activated corrosion products, which are the result of metallic materials entering the water and being activated in the reactor region. Under power

update conditions, the feedwater flow increases with power and the activation rate in the reactor region increases with power. Additionally, non-condensable radioactive gas from the main condenser, along with air in-leakage, normally contains activation gases (principally N-16, O-19 and N-13) and fission product radioactive noble gases. This is the major source of radioactive gas. The proposed power uprate will increase the activity level of radioactive isotopes in the primary and secondary coolant. Due to leakage or process operations, fractions of these fluids are transported to the liquid and gaseous waste systems where they are processed prior to discharge. As the activity levels in the primary and secondary coolant are increased, the activity level of inputs into the waste systems are proportionately increased.

The methodology used for the processing of radioactive waste at Seabrook will not be impacted by operation at the proposed uprated power level, and the slight increase in activity discharged would continue to meet the requirements of 10 CFR Part 20, 10 CFR Part 50, Appendix I, and the annual doses projected in the Seabrook Final Environmental Statement (FES), NUREG-0895, dated December 1982. The NRC staff concludes that the proposed power uprate will not affect the ability to process liquid or gaseous radioactive effluents and the environmental impacts of the proposed power uprate are bounded by the impacts previously evaluated in the FES.

#### Occupational Dose:

Occupational exposure from in-plant radiation primarily occurs during routine maintenance, special maintenance, and refueling operations. An increase in power at Seabrook will increase the activity inventory of fission products in the core by approximately the percentage of the power uprate. As a result, the radioactivity levels in the primary coolant, secondary coolant, and other radioactive process systems and components will also be impacted. Based on an uprate from the current licensed core power of 3411 MWt to the analyzed core power level of 3659 MWt (3678 MWt NSSS power level), normal operation

radiation levels in areas near the reactor vessel are expected to increase but the annual average collective occupational dose after the power uprate is implemented would still be well below the value expected when the FES was published and as set in 10 CFR Part 20. In addition, plant programs and administrative controls such as shielding, plant chemistry, and the radiation protection program will help compensate for the potential increase in occupational dose. The proposed actions does not involve significant increases in the offsite doses to the public from noble gases, airborne particulates, iodine, tritium, or liquid effluents.

The NRC staff concludes that doses offsite will continue to be within the limits of 10 CFR Part 20, and the slight potential increase in occupational exposure are bounded by the impacts previously evaluated in the FES.

Postulated Accident Doses:

The licensee's uprate analysis program included a reanalysis or evaluation of all aspects of large-break loss-of-coolant accident (LOCA), small-break LOCA, non-LOCA accidents, and NSSS and balance-of-plant (BOP) structures, systems, and components. Major NSSS components (e.g., reactor pressure vessel, pressurizer, reactor coolant pumps, and steam generators); BOP components (e.g., turbine, generator, and condensate and feedwater pumps); and major systems and sub-systems (e.g., safety injection, auxiliary feedwater, residual heat removal, electrical distribution, emergency diesel generators, containment cooling, and the ultimate heat sink) have been assessed with respect to the bounding conditions expected for operation at the uprated power level. Control systems (e.g., rod control, pressurizer pressure and level, turbine overspeed, steam generator level, and steam dump) have been evaluated for operation at uprated power conditions. The results of all of the above analyses and evaluations have yielded acceptable results and demonstrate that all design basis acceptance criteria will continue to be met during uprated power operations.



For post-accident conditions, the existing post-accident dose rate maps are adequate for power uprate conditions. The resulting radiation levels were determined to be within current regulatory limits, and there would be no effect on the plant equipment, access to vital areas, or habitability of the control room. The licensee has determined that access to areas requiring post-accident occupancy will not be significantly affected by the power uprate. The calculated whole body and thyroid doses at the exclusion area boundary that might result from a postulated design-basis LOCA at uprated power conditions were determined to remain below established regulatory limits. Therefore, the NRC staff concludes that, for the proposed action, potential increased doses from postulated accidents are not significant.

Non-Radiological Environmental Assessment:

In support of the proposed action, the licensee reviewed the non-radiological environmental impacts of the power uprate based on information submitted in the Seabrook Environmental Report - Operating License Stage (ER-OL), dated June 29, 1981, the Seabrook FES, and the requirements of the Environmental Protection Plan. Based on this review, the licensee concluded that the proposed power uprate has no significant effect on the non-radiological elements of concern and the plant will be operated within the bounds of impacts previously evaluated in the FES. In addition, the licensee states that existing Federal, State, and local regulatory permits presently in effect accommodate the power uprate without modification.

Water Use Impacts:

The Atlantic Ocean serves as the normal supply of cooling water and as the ultimate heat sink for Seabrook. The cooling water is withdrawn from the Atlantic Ocean via a 17,000-foot long intake tunnel in the underlying bedrock, and is returned to the ocean through a similar discharge tunnel, approximately 16,500 feet long. The Circulating Water System (CWS) delivers cooling water from the Atlantic Ocean to the main condenser to remove the heat

rejected by the turbine cycle and auxiliary systems and conveys the heated discharge water back to the Atlantic Ocean. CWS flow rate does not change for the power uprate. Additionally, groundwater is not used in current plant operations; therefore, there will be no additional impacts to onsite groundwater use as a result of the proposed action. The NRC staff concludes that the power uprate will not have a significant impact on water usage at Seabrook.

Thermal Discharge:

The licensee indicates that, at uprated power conditions, with normal CWS flow, the circulating water outlet temperature will increase approximately 2.2 degrees Fahrenheit from the temperature associated with the current power level. However, the maximum CWS outlet temperature associated with the proposed action will continue to be within system design parameters.

The licensee evaluated the thermal impact associated with the power uprate relative to the Seabrook National Pollutant Discharge Elimination System (NPDES) permit. The New Hampshire Office of Ecosystem Protection issued NPDES Permit No. NH0020338 to the licensee for operation of Seabrook. The permit was last renewed on April 1, 2002. The NPDES permit specifies that Seabrook shall not cause a monthly mean temperature rise of more than 5 degrees Fahrenheit within 300 feet of the submerged diffuser in the direction of discharge. Historical data indicates that maximum monthly mean temperatures have been within all NPDES permit parameters. Projected maximum monthly mean temperatures predicted to occur in uprated conditions will continue to be below specified permit limits and bounded by the impacts previously evaluated in the FES. Therefore, the NRC staff concludes that there are no significant impacts from the increased thermal discharge to the Atlantic Ocean as a result of the proposed action.

Noise Evaluation:

The noise effects due to operation of Seabrook at uprated power conditions were reviewed. The power uprate does not require any new motors or pumps. In addition, the turbine and the reactor building supply and exhaust fans will continue to operate at current speeds, and the associated noise levels will also be unaffected by uprated power operations. Consideration of other features affected by the power uprate did not reveal any new and significant sources of noise that would be expected to be noticeable at the site boundary. Therefore, the NRC staff concludes that the noise impacts of the proposed action are bounded by the impacts previously analyzed in the FES.

The non-radiological environmental impacts related to the proposed power uprate at Seabrook have been reviewed and there are no adverse impacts or significant changes required to the current NPDES Permit or other plant administrative limits. No changes to land use would result from the proposed action, and the proposed action does not involve any historic sites. Therefore, no new or different types of non-radiological environmental impacts are expected than those previously considered in the FES.

Summary:

The NRC has completed its evaluation of the proposed action and concludes that there are no significant environmental impacts associated with the proposed action.

The details of the staff's safety evaluation will be provided in the license amendment that will be issued as part of the letter to the licensee approving the license amendment.

The proposed action will not significantly increase the probability or consequences of accidents. No changes are being made in the types of effluents that may be released off site. There is no significant increase in occupational or public radiation exposure. Therefore, there are no significant radiological environmental impacts associated with the proposed action.

With regard to potential non-radiological impacts, the proposed action does not have a potential to affect any historic sites. It has a small affect on non-radiological plant effluents and has no other environmental impact. Therefore, there are no significant non-radiological environmental impacts associated with the proposed action.

Accordingly, the NRC concludes that there are no significant environmental impacts associated with the proposed action.

Environmental Impacts of the Alternatives to the Proposed Action:

As an alternative to the proposed action, the staff considered denial of the proposed action (i.e., the “no-action” alternative). Denial of the application would result in no change in current environmental impacts. The environmental impacts of the proposed action and the alternative action are similar.

Alternative Use of Resources:

The action does not involve the use of any different resource than those previously considered in the FES for Seabrook, NUREG-0895, dated December 1982.

Agencies and Persons Consulted:

On October 18, 2004, the staff consulted with the New Hampshire State official, Michael Nawoj of the New Hampshire Office of Emergency Management, and with the Massachusetts State official, James Muckerheide of the Massachusetts Emergency Management Agency, regarding the environmental impact of the proposed action. The State officials had no comments.

FINDING OF NO SIGNIFICANT IMPACT

On the basis of the environmental assessment, the NRC concludes that the proposed action will not have a significant effect on the quality of the human environment. Accordingly, the NRC has determined not to prepare an environmental impact statement for the proposed action.

For further details with respect to the proposed action, see the licensee's letter dated March 17, 2004, as supplemented by a second letter dated March 17, 2004, and letters dated April 1, May 26, September 13 (two letters), and October 12, 2004. Documents may be examined, and/or copied for a fee, at the NRC's Public Document Room (PDR), located at One White Flint North, Public File Area O1 F21, 11555 Rockville Pike (first floor), Rockville, Maryland. Publicly available records will be accessible electronically from the Agencywide Documents Access and Management System (ADAMS) Public Electronic Reading Room on the Internet at the NRC Web site, <http://www.nrc.gov/reading-rm/adams.html>. Persons who do not have access to ADAMS or who encounter problems in accessing the documents located in ADAMS, should contact the NRC PDR Reference staff by telephone at 1-800-397-4209 or 301-415-4737, or by e-mail to [pdr@nrc.gov](mailto:pdr@nrc.gov). (Note: Public access to ADAMS has been temporarily suspended so that security reviews of publicly available documents may be performed and potentially sensitive information removed. Please check the NRC Web site for updates on the resumption of ADAMS access.)

Dated at Rockville, Maryland, this 8th day of December 2004.

FOR THE NUCLEAR REGULATORY COMMISSION

**/RA/**

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