UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MA 02109-3912

OFFICE OF THE
REGIONAL ADMINISTRATOR

October 26, 2011

Chief, Rules, Announcements and Directives Branch
Division of Administrative Services
Office of Administration
Mail Stop TWB-05-B01M
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 46 Regarding Seabrook Station, Draft Report for Comment, CEQ #20110250

Dear Sir/Madam:

In accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, the United States Environmental Protection Agency (EPA) has reviewed the Nuclear Regulatory Commission's (NRC's) Draft Supplemental Environmental Impact Statement (DSEIS) for the potential relicensing of the Seabrook Station Nuclear Power Station (Seabrook or Seabrook Station) in Seabrook, New Hampshire. The NRC has issued the DSEIS for public comment in support of its decision on the application submitted by NextEra Energy Seabrook, LLC (NextEra) for relicensing Seabrook under the Atomic Energy Act. The NRC prepared the DSEIS to provide site-specific information regarding Seabrook Station to supplement its 1996 Generic EIS for License Renewal of Nuclear Plants.

As described in the DSEIS, NextEra has applied to the NRC for renewal of Seabrook's operating license for an additional 20 years. Seabrook began commercial operation in 1990 and its existing license will expire in 2030. Seabrook's net electrical capacity is 1,245 megawatts-electric (MWe) and it is located approximately two miles west of the shore of the Atlantic Ocean.

Seabrook Station is a nuclear power plant and, as such, the potential licensing of the facility by the NRC raises a number of environmental issues to be considered. These issues include matters related specifically to nuclear power generation, such as public safety, the potential for radionuclide emissions to the environment (i.e., to the air, surface water, groundwater or land), the management of radioactive waste, plant security, and emergency management.

Beyond these issues associated with nuclear power generation, Seabrook's operation also raises other environmental issues common to those raised at fossil fuel power plants. For example, the effects of the facility's cooling system on the environment must be evaluated. Seabrook Station uses an open-cycle cooling system as part of its process for generating electricity. The facility takes approximately 561 million gallons of water from the Atlantic Ocean each day to meet the

plant's condenser cooling needs. It uses this water to absorb the power plant's waste heat and then convey it to the ocean for disposal. In the process of withdrawing ocean water, Seabrook kills or injures large numbers of marine organisms. In addition, the facility's disposal of large quantities of waste heat in the ocean has the potential to degrade the quality of the marine habitat receiving this thermal pollution. Furthermore, discharges by the facility of other pollutants, such as chlorine, to the ocean must also be considered. The DSEIS should characterize these and any other relevant impacts and should discuss alternative means of avoiding, reducing or otherwise mitigating these possible environmental effects. The DSEIS presents and explains the NRC staff's preliminary recommendation that the adverse environmental effects of license renewal for Seabrook Station "are not great enough to deny the option of license renewal for energy-planning decision makers."

In addition to the comments in this letter, we have provided more detailed comments on the DSEIS in the attachment to this letter. These more detailed comments highlight areas where we believe additional information is needed to more fully describe the impacts of Seabrook. Our comments recommend a more complete consideration of alternative plant cooling system scenarios for the relicensing period and also address other operational impacts, including the entrainment and impingement of fish and other aquatic organisms, and releases of tritium to groundwater. The NRC should address these issues in the Final Supplemental Environmental Impact Statement (FSEIS).

We also recognize that pollutant discharges and withdrawals of ocean water for cooling at Seabrook are regulated under the National Pollutant Discharge Elimination System (NPDES) permit issued by EPA to the facility. NextEra has submitted an application to EPA for renewal of the NPDES permit. The comments in this letter are based solely on a review of the information in the DSEIS from the standpoint of what is required by NEPA and are not intended to address the requirements of the Clean Water Act NPDES permit. EPA will address those requirements when it takes action on Seabrook's NPDES permit renewal application.

EPA has some concern about timing of this DSEIS and licensing action being conducted so far in advance of the expiration date of the existing license. The existing license expires in 2030. Therefore, this DSEIS in support of relicensing is being prepared more than 18 years before the existing license expires. While it makes sense to start this process well in advance of the expiration date to allow for the time needed to conduct an appropriate analysis and allow for public involvement in the process, 18 years may be excessive. Such a large span of lead time poses potential problems, such as the increased chance that conditions could change in material ways that would necessitate further supplemental environmental review and revisiting of the licensing decision. There is always a risk of changed circumstances, but that risk is much greater when a review is being done so far before the action in question will take effect.

In addition, commencing the EIS process this far in advance of when the new license would go into effect calls for the public and numerous state and federal agencies to mobilize themselves and apply their limited resources to address an action that will not go into effect for more than 18 years and that, as stated above, is necessarily at greater risk of having to be revisited due to changed circumstances. Waiting to start the EIS process until the need for relicensing is closer in time may be a preferable approach. Alternatively, the NRC could explain in the Final

Supplemental Environmental Impact Statement (FSEIS) why it has commenced the EIS process so far in advance of actual relicensing and its strategy for monitoring for changed circumstances that might trigger the need for further environmental review prior to the actual relicensing.

For the reasons discussed above (and in the attachment that follows), EPA has rated this DSEIS "EC-2 Environmental Concerns-Insufficient Information" in accordance with EPA's national rating system, a description of which is attached to this letter. We look forward to reviewing responses to the issues highlighted in this letter and technical attachment in the FSEIS. EPA is available to provide additional input, as necessary, to help the NRC respond to the issues discussed in this letter. Please feel free to contact Timothy Timmermann of the Office of Environmental Review at 617/918-1025 if you wish to discuss these comments further.

Sincerely,

H. Curtis Spalding
Regional Administrator

Attachment

Summary of Rating Definitions and Follow-up Action

Environmental Impact of the Action

LO--Lack of Objections
The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC--Environmental Concerns
The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO--Environmental Objections
The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU--Environmentally Unsatisfactory
The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1--Adequate
EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2--Insufficient Information
The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3–Inadequate
EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

Detailed Comments
Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 46 Regarding Seabrook Station
Draft Report for Comment

Consideration of Alternative Cooling System Designs over the Relicensing Period

The DSEIS documents meaningful entrainment impacts from the normal operation of Seabrook's cooling water system. For example, data presented in the DSEIS suggests destabilization of populations near the facility's cooling water intake structure (see, for example, the discussion at pages 4-20 and 4-34). In particular, the DSEIS explains that cumulative impacts on aquatic species would be "MODERATE for most species and LARGE for winter flounder, rainbow smelt, and other species that would be adversely affected from climate change, such as lobster and Atlantic cod." In addition, the NRC recognizes (page 8-4) "...the mounting concerns for potential adverse impacts to aquatic ecosystems from once-through cooling systems..." and suggests (page 8-14) that a new plant constructed today would likely use closed cycle cooling due to the potential for aquatic impacts. EPA shares these concerns and finds NRC's suggestion with regard to how a new plant would likely be designed to be reasonable.

While EPA understands that the NRC concludes that "...the adverse environmental impacts of license renewal for Seabrook are not great enough to deny the option of license renewal for energy planning decision makers." Nevertheless, EPA regards these concerns to be significant enough to warrant careful assessment of a range of alternatives for structural and operational modifications to the Seabrook cooling system that could reduce these adverse impacts should the plant be relicensed. In addition, we recommend that the FSEIS fully discuss and evaluate the comparative environmental impacts of these alternatives. Project modifications should be framed as operational alternatives (for impact comparison purposes) and the FSEIS should characterize the relative impacts of the alternatives, such as the differing numbers of organisms to be impinged and/or entrained by the intake structure under the different alternatives. The information from the analysis should be utilized to support NRC decision-making under the criteria applicable to its licensing decision. The FSEIS should not, however, purport to provide or suggest the answers to the ultimate permitting questions that EPA must address under the Clean Water Act.

Concerns with Estimated Impacts

Due to the large cooling water demand at Seabrook Station, total entrainment and impingement loss estimates are correspondingly high. The mean entrainment losses for fish eggs are almost 1 billion per year, with maximum losses per year being more than twice that. Mean entrainment loss estimates for fish larvae are about 260 million a year, with the peak estimate being approximately 1 billion larvae per year. In addition, on average, 18×10^{12} larval bivalve are lost each year, with peak years being 3.5 times more than that.

Impingement losses varied from a low of 7,200 fish and lobsters per year to nearly 72,000 per year. The mean impingement rate of fish and lobsters is approximately 21,000 per year.

Rainbow smelt is a Species of Concern for NOAA and has suffered annual impingement losses of over 1,000 fish per year, on average.

These large entrainment and impingement losses are worthy of concern on their own, but they become especially troubling when viewed in conjunction with the trawl survey results. Trawl surveys showed a statistically significant reduction in the nearfield abundance of rainbow smelt and winter flounder. The data also suggested a nearfield reduction in silver hake, but this was not statistically tested. EPA agrees with the characterization of the impact to winter flounder as large. We also think that the impact to rainbow smelt should be characterized as large, in part due to the size of the impact and the current status of the stock. Moreover, EPA concludes that that the impacts to silver hake should also be rated as moderate in light of the trawl survey results presented in the DSEIS.

Need for Expanded Monitoring Program

The monitoring program that has been in place through the NPDES program has provided a useful long-term record of conditions offshore. The trawl program has now detected an impact for several fish species in the nearfield stations. Due to the limited number of trawl stations, however, the geographic scope of this impact cannot be characterized with a high level of confidence. In light of the recent results, EPA believes that an expansion of the geographic coverage of the trawl program is in order to better characterize the full scope of the impacts. We look forward to discussing expansion of this effort at the federal-state interagency review meetings to discuss biological monitoring data anticipated to occur in December 2011.

Comparison with Other Facilities' Entrainment and Impingement (pages 4-16 to 4-19)

The DSEIS compares entrainment and impingement losses between Seabrook and the Pilgrim Nuclear Power Station in Plymouth, MA (Pilgrim), in an effort to characterize the scale of the impacts. EPA believes that it is inappropriate to draw conclusions on the scale of impact at one facility by simply comparing its entrainment and impingement numbers with those of another facility. The specific circumstances of each receiving water and species involved must be taken into account. In other words, each facility must be evaluated individually in light of its ecological context. For example, entrainment and impingement losses caused by the Brayton Point Station power plant in Somerset, MA, were very large, but were lower on an absolute basis than the losses at either Pilgrim or Seabrook. The losses at Brayton Point Station were regarded to be very serious because of their contribution to a baywide decline in fish populations. Losses at Seabrook need to be evaluated in light of their environmental context. (EPA also notes that it does not necessarily concur with the characterization of the losses at Pilgrim presented in the DSEIS.)

Groundwater Contamination

<u>Background</u>
Radionuclide contamination of groundwater at the Seabrook site is a concern. Since a leak was detected in the spent fuel pool water in 1999, Seabrook has undertaken efforts eliminate the leak and to monitor and actively contain tritium-contaminated groundwater. Although there are no

known drinking water supplies downgradient of the site and no drinking water supplies appear to be threatened by tritium-contaminated groundwater, the continued detection of elevated tritium in groundwater requires vigilance. Based on our review of the DSEIS, it is unclear whether groundwater monitoring and containment activities performed at the site are performed on a voluntary basis or are subject to regulatory or public oversight.

Comments/Recommendations

Due to the history of radionuclide contamination of groundwater at this site (and others around the country), we offer the following comments and recommendations:

- Seabrook's efforts related to groundwater contamination should be reported publicly and subject to review by appropriate regulators. Information related to groundwater tritium contamination should be made easily accessible by the public. The Vermont Department of Health's website on tritium contamination at Vermont Yankee provides a useful example of how data can be made accessible to the public (http://healthvermont.gov/enviro/rad/yankee/tritium.aspx).
- We recommend license renewal permit conditions that require groundwater monitoring and reporting to ensure that groundwater contamination is appropriately characterized and controlled. Groundwater monitoring and management should be part of a well-defined, long-term, comprehensive strategy. Periodic reviews of the overall strategy and the data and reports generated should be conducted in coordination with Seabrook and NRC officials.
- Groundwater sampling for other contaminants of concern (e.g. metals) should also be conducted to ensure that the full extent of contamination has been characterized. Groundwater analytes should not be limited to tritium, but should also include additional contaminants that are present in spent fuel pool water, the source of the leak. For example, Cesium 137 and Strontium 90 are potential additional contaminants to be monitored. In order to obtain a representative sample, unfiltered, "low flow" sampling should be employed.
- Management and monitoring of groundwater should be conducted in accordance with the recommendations contained in NRC's Groundwater Task Force Final Report, June 2010 (http://www.regulations.gov/#!documentDetail;D=NRC-2010-0302-0002).

Questions regarding these recommendations should be directed to Marcel Belaval at 617-918-1239 (belaval.marcel@epa.gov).

Comment Related to the Combination Alternative of Natural-Gas-Fired Combined-Cycle and Wind Alternative

Section 8.3 of the DSEIS analyzes the Combination Alternative of Natural-Gas-Fired Combined-Cycle and Wind as a means to replace the baseload power of Seabrook Station. This framework can work conceptually when just "truing up" the annual output of a small gas plant and a series of wind farms, but we believe it would be challenging to achieve full replacement as described in the DSEIS, particularly when the gas plant is sized for only half of the output of Seabrook. The discussion does not fully address how baseload power plants work – which is to provide a

steady, daily, consistent source of power. While the DSEIS presents a range of sizes and locations of wind farms to help address the variability of wind speed and duration, there are still likely to be times when the output from the wind farms is less than their share of the amount of power produced daily by a baseload power plant. Therefore, we believe periodic gaps in output from the wind farm arrays would be more realistically addressed through a combination alternative gas plant sized for more than just half of the total output.