UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OFFICE OF THE
REGIONAL ADMINISTRATOR

September 6, 2007

Chief, Rules Review and Directives Branch
U. S. Nuclear Regulatory Commission
Mail Stop T6-D59
Washington, DC 20555-0001

Re: Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 30 Regarding Vermont Yankee Nuclear Power Station, Final Report, CEQ #20070335

Dear Sir/Madam:

In accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act we have reviewed the Nuclear Regulatory Commission's (NRC's) Final Supplemental Environmental Impact Statement (FSEIS) for relicensing of the Vermont Yankee Nuclear Power Station (Vermont Yankee) in Vernon, Vermont.

As described in the FSEIS, Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations, Inc. (Entergy) has submitted an application to the NRC for renewal of the operating license for an additional 20 years. Vermont Yankee began operations in 1972 and the current operating license will expire in 2012. Vermont Yankee is a 650 MW nuclear power steam electric-generating facility located on the western shore of the Connecticut River. Cooling water is drawn from the Connecticut River and is then circulated through the plant in one of three operation modes: open-cycle, hybrid-cycle or closed-cycle.

The FSEIS contains the NRC staff recommendation "that the Commission determine that the adverse environmental impacts of license renewal for VYNPS are not so great that preserving the option of license renewal for energy-planning decisionmakers would be unreasonable."

Our comments on the FSEIS, which are contained in the attachment to this letter, highlight areas where we believe additional information is needed to more fully describe the impacts of Vermont Yankee. Specifically, these comments address the impacts of operation, including from thermal discharge, and the entrainment and impingement of fish and other aquatic organisms in the facilities cooling system. As the FSEIS points out, the intake and discharge of water at Vermont Yankee are regulated under the Clean Water Act's National Pollutant Discharge Elimination System (NPDES) permit, administered in Vermont by the Vermont Department of Environmental Conservation (VTDEC). Entergy has submitted an application to the VTDEC for renewal of the NPDES permit. The comments in this letter are solely from the standpoint of what is required under NEPA, and are based on a review of the responses to issues we raised in

our comments on the DSEIS, or new information provided in the FSEIS. Our comments are not intended to address the requirements of the Clean Water Act NPDES permit.

We appreciate the opportunity to comment on the FSEIS. My staff is available to provide additional input, as necessary, to help the NRC further consider and address in the Record of Decision 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,

Robert W. Varney
Regional Administrator

Attachment

Detailed Comments
Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 30 Regarding Vermont Yankee Nuclear Power Station
Final Report

EPA's comments are limited to issues raised in our review of the DSEIS, or new information provided in the FSEIS NRC in response to our comments.

Comments related to the assessment of environmental impact from the entrainment and impingement of fish and other aquatic organisms

1. In comments on the DSEIS, EPA requested clarification of two statements in the DSEIS that appeared to be contradictory. The first, found on page 4-15 of the DSEIS, stated, "When ichythoplankton are at their peak in the Connecticut River (e.g., late spring through early summer), VYPNS is generally operating in an open-cycle or hybrid mode." The second, on page 4-17, suggested that potential impacts from entrainment of fish and shellfish would be "SMALL" based in part on the utilization of the closed- or hybrid-cycle mode during much of the spawning season. EPA recommended that if the first statement erroneously used "open-cycle" instead of the intended "closed-cycle", then the error should be corrected in the FSEIS. However, if the first statement was indeed accurate (i.e., the plant was operating in open-cycle or hybrid mode) then the NRC should re-evaluate its basis for a conclusion of "SMALL" impact.

In the FSEIS, the NRC simply deleted the first statement which indicated that the plant operates in open-cycle or hybrid mode during the peak period of ichthyoplankton abundance. In its response to our comment, the NRC states only that the text had been changed to correct the conflicting comments. EPA's review of the river temperature data for the period when fish eggs and larvae (commonly referred collectively as "ichthyoplankton") are most abundant suggests that the plant would likely be running in open-cycle or hybrid mode for much of this time period. Therefore, it appears the NRC simply deleted an accurate statement from the FSEIS that conflicts with its conclusion that impacts from entrainment at VYNPS are small.

2. The NRC's conclusion related to entrainment potential over the 20-year renewal period suggests that plant operations will continue as they have historically. According to the FSEIS (page 2-6) VYNPS requested and received authorization from the NRC for a power uprate to increase the gross electrical output of the facility from 540MW to 650MW. In response to EPA's comments on the DSEIS, the NRC stated that such an increase in electrical output would not result in an increase in river water withdrawal. However, it suggested that the cooling towers may need to be operated more often to meet thermal discharge impacts set forth in the NPDES permit. Yet, at the same time, VYNPS has been seeking permission to run its cooling towers less than currently required. The FSEIS should have addressed the extent to which cooling water withdrawals and thermal discharges would increase as a result of the facility's uprate if it also was given permission to run the cooling towers less often. In addition, recent articles in the press have indicated that VYNPS has had a recent failure of certain of its cooling tower cells. The NRC assumes that technologies established at VYNPS to minimize environmental impacts will be properly maintained over the 20-year renewal period, but that assumption needs to be explored in light of these facts. The extent of the cooling tower problems should be assessed,

and maintenance or upgrade needs should be evaluated. These issues are relevant to determining the soundness of the NRC's 20-year projection for the license renewal and should be addressed in the Record of Decision.

3. EPA requested in comments on the DSEIS that the NRC include in the FSEIS total entrainment estimates for the species listed in Table 4-3 (Pg. 4-17 in the FSEIS). Table 4-3 presents percentages and numbers of fish eggs and larvae entrained at Vermont Yankee. According to the DSEIS (pg. 4-15), sampling for eggs and larvae is conducted weekly from early May through mid-July. While Table 4-3 includes quantities of eggs and larvae collected during the sampling period, it does not provide an estimate the total number of eggs and larvae that are actually entrained. The DSEIS does not describe the sampling procedures so it is unclear what these numbers represent. To develop representative estimates of entrainment, time and flow rates would have to be factored in with larval concentrations on a weekly basis. Entrainment rates may indeed be small compared to the number of ichthyoplankton in the Vernon Pool. However, listing only the number of eggs and larvae collected during sampling does not provide sufficient information for determining how many eggs and larvae are lost during the continuous operation of the plant when these early lifestages of fish are most vulnerable to entrainment. For example, if each weekly sample takes 30 minutes to collect, the annual numbers provided in Table 4-3 could represent 10 weekly sampling events (May 1 to mid-July), or just 5 out of the 1,680 hours (0.3 percent) the plant is operating during that time period.

By omitting basic information needed to assess entrainment mortality, the NRC has failed to support its conclusion in the FSEIS that entrainment impacts are small. Therefore, this analysis is inadequate.

4. In response to comments from EPA and others concerning the absence of any descriptive information in the DSEIS on the cooling water intake structure (CWIS) at VYNPS, the NRC included a description of the CWIS in the FSEIS, as well as information pertaining to the intake velocities under various river levels. According to this new information, intake velocities at the CWIS range from 1.57 feet per second (fps) at normal river levels to a high of 1.96 fps under extreme low flow conditions. These velocities are considerably higher than the industry standard of 0.5 fps. In addition, the CWIS has no fish return system so every fish that is impinged is killed. Despite the high potential for impingement mortality, the NRC has concluded that the potential impacts of impingement on fish and shellfish by VYNPS would be "SMALL." According to the FSEIS, the NRC reached this conclusion because no observable impacts to any fish species or to the overall fish community of the Vernon Pool attributable to impingement has been demonstrated.

It appears that only the total numbers collected during impingement sampling for each year are provided in Table 4-4. EPA requested that impingement estimates be included in the FSEIS for the years listed in Table 4-4, but none were provided. The NRC does include some estimates for daily impingement based on earlier studies. According to the FSEIS, about 40,000 fish were collected in sampling that took place between 1981 and 1989 for an average of nearly 26 fish impinged per 24-hour period. Again, this figure appears to only represent sampling effort, not the estimated number of fish impinged every day that the plant is operating.

As with entrainment impacts, NRC has not supported its conclusion in the FSEIS that impingement impacts are small. Clearly, the information provided in the FSEIS demonstrates that impingement impacts are indeed occurring. A conclusion that impingement impacts are small should not be predicated on the inability to identify a population-level decline of one or more species that is directly attributable to impingement losses. Such a demonstration is not a threshold established under NEPA or the CWA as it applies to impingement mortality.

5. In addition to our questions regarding both the NRC's estimates of entrainment and impingement impacts and the NRC's conclusions that entrainment and impingement impacts should be characterized as "small," we also believe that NEPA requires an evaluation of alternatives (whether as alternative actions or as alternative mitigation options) for reducing entrainment and impingement impacts. Notwithstanding that leaves the decision of whether such steps would be needed to the NPDES permit process, the NRC's EIS should assess the available options, especially the extent of their compatibility with VYNPS's planned nuclear power generation operation.

Comments related to the assessment of environmental impact from Thermal Discharge

6. EPA recommended that the NRC provide more discussion in the FSEIS on the stressors that may be affecting the poor returns of anadromous species such as Atlantic salmon and American shad, and provide a range of alternatives for VYNPS to further reduce impacts to these species. The NRC responded that thermal discharges may result in some slight incidental stress to certain species, but such stress would be inconsequential when compared to other stresses due to human activities on the Connecticut River. Further, the FSEIS states that the NRC's regulatory jurisdiction is limited to the characterization of impacts in accordance with NEPA. Impacts to migrating fish associated with thermal effects from VYNPS may or may not be as significant as other stressors. However, under NEPA, the NRC should be assessing the cumulative effect of all stressors combined, not only comparing one stressor to another. EPA agrees with the NRC that its responsibility is to characterize impacts, but would add that they be accurately and adequately characterized. We also believe that identifying a range of potential alternatives to minimize impacts is required under NEPA. Indeed, identifying such alternatives for minimizing or mitigating these impacts--even though the ultimate decisions about them would be left to the Clean Water Act permitting process-- is a part of characterizing the potential impacts of the facility's operations.

7. EPA requested that the FSEIS include temperature data that graphically depicts the spatial extent of the thermal plume below the Vernon Dam, and its behavior within the water column, under various seasonal and flow conditions. This information would provide important information on when and how much habitat may be unsuitable to certain fish species less tolerant of heat. The NRC has not provided this information in the FSEIS.

8. The FSEIS primarily focused on thermal impacts associated with acute thermal stress, which it referred to as "heat shock." As we commented on the DSEIS, the use of the term "heat shock" implies a fairly limited scope of review for a pollutant (i.e., heat) that can affect aquatic organisms and their habitats in many ways other than "shock." We recommended that the discussion in FSEIS on this subject be expanded to address heat's less conspicuous ability to: 1)

prevent the use of affected areas by temperature-sensitive species; 2) attract and expose organisms to areas of elevated temperature during spawning periods; and 3) expose eggs and larvae to water temperatures above levels that are optimal for the affected species and life stage or would be typical in the absence of the thermal discharge. This information was not included in the FSEIS. Without this information, the NRC's conclusions related to the impacts on fish associated with VYNPS thermal discharge are not sufficiently supported.