UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OFFICE OF THE
REGIONAL ADMINISTRATOR

March 2, 2005

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

Re: Draft Supplemental Environmental Impact Statement (DSEIS) for License Renewal of Nuclear Plants at the Millstone Power Station, Units 2 and 3, NUREG-1437, Supplement 22 (EPA ERP #NRC-B06005-CT)

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) Draft Supplemental Environmental Impact Statement (DSEIS) for relicensing of Units 2 and 3 of the Millstone Nuclear Power Station in Waterford, Connecticut.

As described in the DSEIS, Dominion Nuclear Connecticut, Inc. (Dominion) as submitted an application to NRC for renewal of the operating licenses for an additional 20 years. The current operating licenses expire in 2015 for Unit 2 and 2025 for Unit 3. The DSEIS was prepared to provide site specific information to supplement NRC's 1996 Generic EIS for License Renewal of Nuclear Plants. It contains the NRC staff's preliminary recommendation that adverse environmental effects of license renewal at Millstone are not so great that preserving the option of license renewal would be unreasonable.

Our comments on the DSEIS, 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 the Millstone facility. Specifically, these comments address the environmental impacts of operation, including entrainment and impingement of fish and shellfish, impacts from heat shock, and cumulative impacts. We encourage the NRC to address these issues prior to the close of the NEPA process. We also recognize that the intake and discharge of water at Units 2 and 3 are regulated under the Clean Water Act's National Pollutant Discharge Elimination System (NPDES) permit, administered in Connecticut by the Connecticut Department of Environmental Protection (CTDEP). As discussed in the DSEIS, Dominion has submitted an application to the CTDEP for renewal of the NPDES permit. The comments in this letter are based solely on our review of the information in the NRC's 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.

For the reasons discussed above (and in the attachment which 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 Final Supplemental Environmental Impact Statement (FSEIS). My staff 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 me or 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

cc:

Gina McCarthy, Commissioner, Connecticut Department of Environmental Protection

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.

Additional Detailed Comments
Draft Supplemental Environmental Impact Statement (DSEIS) for
License Renewal of Nuclear Plants at the Millstone Power Station, Units 2 and 3,
NUREG-1437, Supplement 22

Comments on Chapter 2 - Description of Nuclear Power Plant and Site, and Plant Interaction with the Environment

Pg. 2-1. The DSEIS identifies the years when construction began for each of Millstone's three units, but does not mention when the units came on line for commercial production of electricity. These dates, as well as dates when each unit was offline for extended periods, would be helpful in reviewing fish impingement and entrainment data, and should be included in the FSEIS.

Pg. 2-7. Intake velocity is estimated to be about 0.2 meters per second in front of the Unit 2 structure. The DSEIS does not state at what distance from the intake screen the velocity was measured. Intake velocity should be presented in feet per second and should be estimated as through-screen velocity, not in front of the screen, which estimates approach velocity. Additionally, no intake velocity data are provided for Unit 3. This information is important for assessing the potential of the intake structure to impinge organisms, and should be provided in the FSEIS.

Pg. 2-7. The DSEIS identifies some features of the intake structure (e.g., traveling screens, fish return trough), but additional information is needed to assess the adequacy of the system for returning fish and other organisms in good condition, as well as the potential to re-impinge organisms that have been discharged from the fish return troughs. We recommend that the FSEIS include information on the water pressure(s) of the spray wash system used to remove fish and debris from the traveling screens, the frequency at which the traveling screens are rotated, a spatial-view diagram that includes the location of the intake structures and fish return troughs of each unit, and any other information pertaining to system design or operation that may affect the impingement of organisms and the likely condition of those that are impinged.

B5
Aquatic returns
Info on fish return
mechanisms

Comments on Chapter 4 - Environmental Impacts of Operation

Among the various potential impacts to the environment associated with the operation of a power plant that utilizes once-through cooling water technology, the NRC identifies three issues that warrant a site-specific review at Millstone, identified in the DSEIS as Category 2 issues. These are 1) entrainment of fish and shellfish, 2) impingement of fish and shellfish, and 3) "heat shock". The following comments identify information that we believe should be provided in the FSEIS.

Entrainment

In Section 4.1.1 entitled "Entrainment of fish and shellfish in Early Lifestages," we could not find data or discussion about shellfish resources. While shellfish larvae may represent a small fraction of the total composition of all larvae entrained, we recommend that the FSEIS include a discussion about species such as lobster, which has suffered significant declines throughout Long Island Sound. Larval lobster are entrained at other coastal plants, and it is likely that there is some loss occurring at Millstone associated with the daily withdrawal of up to 2.1 billion gallons of water. We recommend that the FSEIS address the entrainment of larval lobster, blue crab, and other shellfish of commercial and recreational interest.

Pg. 4-12. Table 4-3 (Percent Composition of Fish Larvae and Eggs) is unclear on what the significance of the dates is for each column, and why dates for larvae differ from those for eggs. In addition, it is unclear why a 26-year average of percent composition data for larvae is compared to data from one year (2002-03). We believe it would be more useful to provide a graph that depicts how percent composition has changed annually over the past 27 years. We recommend that the graph include, at minimum, bay anchovy, winter flounder, Atlantic menhaden, American sandlance, grubby, tautog, and cunner.

Pg. 4-13. Table 4-4 presents larvae entrainment data for select species of fish. As presented, this table is not clear as to how many larvae are entrained on an annual basis. While knowing larval concentration (i.e., the number of larvae per volume of water sampled) is important in understanding the seasonal variations in larval abundance for each species, it does not in itself provide a clear sense of the annual loss of larvae from the plant's operation. We recommend that this table be replaced or accompanied by a table in the FSEIS that lists the estimated total larvae for each species entrained annually from1976 - 2003. While the entrainment numbers may reflect differences in operating schedules from year to year and such considerations should be noted where they exist, of greatest interest is the number of larvae for each species being removed from the system. We recommend that that number be provided in the FSEIS.

Pg. 4-14. Table 4-5 presents similar data to Table 4-4, but for eggs of three fish species. However, Table 4-5 presents what appears to be the total numbers of eggs entrained annually and a volume that corresponds with the volume withdrawn during the period when these eggs were likely to be entrained. This may be what the DSEIS was intended to illustrate in Table 4-4 (the number listed multiplied by 1 million), but it was not noted on the headers of each column.

While an understanding of how many eggs and larvae are entrained annually is important, the significance of those numbers varies from species to species based on a number of variables including species fecundity, age to maturity, estimated annual mortality, recruitment, and status of the local population. Another consideration that we recommend be addressed is whether a species is an important forage source to local predatory species, and what the loss of their eggs and larvae represent in terms of foregone productivity to the local ecosystem. These analyses were likely performed by Millstone, and we recommend that the FSEIS provide additional information on what the loss of eggs and larvae represent in terms of adult equivalents, and the amount of

production foregone for forage species. Additionally, for species that are exhibiting depressed local stocks, such as winter flounder and cunner, we recommend that information on spawning stock biomass forgone also be provided. The loss of one adult winter flounder could represent the cumulative loss of future egg production for 14 years, or more.

Pg. 4-21. The DSEIS concludes that impacts to the Niantic River winter flounder population from entrainment is "moderate," though it suggests fishing mortality plays a much more significant role. Other stressors, including rising water temperatures, are also cited as possible contributing factors. According to the DSEIS (pg.1-4), "moderate" is defined as "Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource." From our review of the DSEIS, there seems to be general agreement that the Niantic River winter flounder stock has been destabilized, that multiple stressors are contributing to this condition, and that the entrainment of larvae at Millstone (e.g., 492 million in 1992) is one of the contributing stressors.

The DSEIS concludes that the NRC has no role in mitigating for entrainment impacts since such impacts are regulated under the Clean Water Act. We agree that these impacts are regulated under CTDEP's NPDES permit. However, we believe that under NEPA, the FSEIS needs to fully evaluate and disclose the potential environmental impacts from this operation, and identify possible operational and technology alternatives that could effectively mitigate for the loss of aquatic resources. The DSEIS correctly identifies the unique vulnerabilities associated with the winter flounder's habitat of returning to natal systems to spawn, suggesting that localized impacts could dramatically influence local population dynamics. However, the DSEIS includes only a very limited discussion on mitigation alternatives, and suggests that any reduction in entrainment losses would lessen the impact of the plant on the Niantic River winter flounder population. This assessment does not fully document the plant's impact on the decline of local winter flounder stocks.

Pg 4-20. The DSEIS concludes that there is no clear evidence of entrainment impact on species other than winter flounder. While other species may not exhibit the same site fidelity for spawning that winter flounder exhibit, data presented in the DSEIS indicate there is a potential cause for concern that additional losses associated with entrainment to already depressed fish stocks, such as bay anchovy and cunner, could impede stock recovery, at least locally. We believe that entrainment impacts to fish populations that are regionally depressed should receive closer scrutiny in the FSEIS.

The DSEIS notes that populations of sandlance, bay anchovy, and cunner have been depressed for decades. Anchovy populations reached a 27-year low in 2002. On pg. 4-27, the DSEIS states that anchovy declines appear to be reflecting a regional decline in the stock, but on pg. 2-28 it states that population data for anchovy are not available for Long Island Sound or the Mid-Atlantic region, and therefore "...it is not possible to assess whether decreasing abundance of this species near Millstone is a reflection of regional populations". For the FSEIS, we recommend that Millstone's potential impacts to anchovy populations be reassessed and clarified.

Impingement

Pg. 4-24. Table 4-6 provides impingement data for Units 1 and 2. Apparently, no data was collected for Unit 3 based on survival studies that indicated high survival rates for demersal species during cool and cold water periods. Pelagic species, including long-finned squid, bay anchovy, and Atlantic silversides, had poor rates of survival year-round. While these studies may provide some sense of the fish return system's effectiveness for demersal species in cool or cold water conditions, it also clearly demonstrates that some species such as bay anchovy and menhaden are not likely to survive impingement. In addition, it does not indicate what the survival rate is during the warm water months of summer and early fall when the newest year class of some species such as winter flounder are likely to be present in the vicinity of the intakes, and vulnerable to impingement. We recommend that Information on survival rates of demersal species during warmer periods be included in the FSEIS.

The DSEIS states (pg. 4-23) that the highest annual impingement of winter flounder for Unit 2 and 3 combined was 2,446 fish, in 1986. However, Table 4-6 indicates that the largest annual impingement of winter flounder was estimated to be 23,554. The table does not mention whether the number reflects impingement rates for Unit 3. The FSEIS should clarify the estimate of total annual impingement for winter flounder and other species listed in Table 4-6 that reflects impingement numbers for all units together.

The DSEIS states (pg. 4-27) that the measures in place at Millstone Units 2 and 3 provide mitigation for impacts related to impingement, and no new measures are warranted. This conclusion is a departure from NRC's approach taken for entrainment which is to defer the issue of mitigation to the CTDEP. It is unclear why the DSEIS advises that no further mitigation is warranted for impingement, but for entrainment impacts which the NRC believe are moderate, the question of need for, and alternative ways to accomplish, mitigation is largely deferred. As noted above, we believe that under NEPA, a discussion of appropriate mitigation alternatives should be in the FSEIS. In addition, we recommend that the FSEIS not view entrainment and impingement as mutually exclusive impacts, but instead assess the combined effects of entrainment, impingement, and the thermal plume on species such as winter flounder and anchovy that are vulnerable to two or all of these stressors.

Heat Shock

Pg 4-27. This section of the DSEIS provides a limited discussion of some potential environmental impacts associated with the discharge of heated effluent. 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. We recommend that the FSEIS's discussion be expanded to address heat's less conspicuous ability to: 1) preclude 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 well above levels that are typical under ambient conditions.

While thermal plumes tend to remain near the surface during most of the year, they have been known to become negatively buoyant during the colder winter periods. If this is the case at Millstone, or if the thermal plume affects the entire water column in shallow areas of Niantic Bay, we recommend that the FSEIS address how the plume might affect adult winter flounder entering Niantic Bay in the winter months en route to spawning grounds in the Niantic River. The 8,000 foot thermal mixing zone, in which temperatures are permitted to exceed ambient levels by 4°F, appears to cover most of Niantic Bay. We recommend that the FSEIS provide a spatial-view graphic depicting maximum temperatures of the thermal plume under various tidal conditions and seasons, and a more comprehensive analysis of the potential sub-lethal effects caused by the thermal plume.

The DSEIS contains a preliminary conclusion that potential impacts to fish and shellfish due to heat shock are small, and that no new mitigation measures are warranted (pg. 4-29). As stated above, EPA believes that the FSEIS should provide a broader review to ensure that all of the possible thermal effects associated with Millstone's daily discharge of up to 2.1 billion gallons of heated water are adequately assessed. We recommend that the FSEIS re-evaluate Millstone's thermal impacts, at least for winter flounder, before reaching a final conclusion on this issue.

Cumulative Impacts

The DSEIS (pg. 4-57) identifies fishing mortality, entrainment from Millstone water withdrawals, environmental changes associated with regional increases in water temperature, and predator-prey interactions as the primary stressors contributing to continuing low winter flounder population levels in the Niantic River area. EPA agrees that there are multiple stressors affecting winter flounder, but we believe that other impacts from Millstone besides entrainment may be helping to impede stock recovery, if not contributing to the population decline.

Impacts from impingement on winter flounder and other depressed stocks have an additive effect to entrainment losses, and we recommend that they be discussed in the assessment of cumulative impacts. In addition, while the thermal plume from Millstone may not be causing acute mortality to winter flounder and other species, non-lethal effects may have a significant effect to the Niantic Bay area. According to the DSEIS, water temperatures in Long Island Sound (LIS) have increased over a 25-year period by 2.8°F/1.8°F (daily/annual mean). Temperatures in Millstone's mixing zone are permitted to be up to 4.0°F higher than ambient. The DSEIS states that elevated water temperatures in LIS may be a major contributing factor to the flounder's decline, but the report does not address possible effects elevated temperature from Millstone's thermal plume has on Niantic Bay, most of which is contained within the designated thermal mixing zone. If there is information supporting a conclusion that thermal effects are not having any adverse impacts on winter flounder behavior, spawning success, habitat use, young-of-year survival, changes in trophic dynamics or forage opportunities, we recommend that it be included in the FSEIS.

We recommend that the FSEIS provide maps with depictions of the thermal plume on multiple stages of the tide. These maps should include known aquatic resources, such as shellfish beds, fish spawning and nursery habitats and fish migration routes.