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U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Serial No.	13-213
MPS Lic/GJC	R0
Docket No.	50-423
License No.	NPF-49

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3
2012 ANNUAL ENVIRONMENTAL PROTECTION
PLAN OPERATING REPORT

In accordance with Section 5.4.1 of the Environmental Protection Plan (EPP), Appendix B to the Millstone Power Station Unit 3 Operating License, Dominion Nuclear Connecticut, Inc. hereby submits the Annual Environmental Protection Plan Operating Report (AEPPOR), describing implementation of the EPP for the previous year. Enclosure 1 transmits information for the period of January 1, 2012 to December 31, 2012.

Should you have any questions regarding this report, please contact Mr. William Bartron, at (860) 444-4301.

Sincerely,

R. K. MacManus
Director, Nuclear Station Safety and Licensing

IE25
NRR

Enclosures: 1

Commitments made in this letter: None.

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Serial No. 13-213
Docket No. 50-423
License No. NPF-49

Enclosure 1

MILLSTONE POWER STATION UNIT 3
2011 ANNUAL ENVIRONMENTAL PROTECTION PLAN OPERATING REPORT
JANUARY 1 – DECEMBER 31, 2012

MILLSTONE POWER STATION UNIT 3
DOMINION NUCLEAR CONNECTICUT, INC. (DNC)

2012 Annual Environmental Protection Plan Operating Report (AEPPOR)

1. Introduction:

   This report covers the period January 1, 2012 through December 31, 2012. During 2012, Millstone Power Station Unit 3 (MPS3) operated at a capacity factor of 100.5%, with only short, partial downpowers (e.g., to backflush condensers due to storm debris); from the end of refueling outage 3R14 in November 2011 through the end of 2012, MPS3 has operated at an overall capacity of 100.2%.

   As required by the MPS3 Environmental Protection Plan (EPP), Appendix B to the MPS3 Operating License, this AEPPOR includes:

   - summaries and analyses of the results of environmental protection activities,
   - a list of EPP noncompliances,
   - a list of all changes in station design or operation which involved a potentially significant unreviewed environmental question, and
   - a list of non-routine reports, describing events that could have resulted in significant environmental impact.

2. Environmental Protection Activities:

   2.1 Annual National Pollutant Discharge Elimination System (NPDES) Report of Ecological Monitoring (EPP Section 4.2).

   Section 10(A) of Millstone Power Station's (MPS) NPDES permit, as issued to Dominion Nuclear Connecticut, Inc. (DNC) by the Connecticut Department of Environmental Protection (now the Department of Energy and Environmental Protection, or DEEP) on September 1, 2010 (the Permit), requires continuation of biological studies of supplying and receiving waters, entrainment, and intake impingement monitoring. These studies include analyses of intertidal and subtidal benthic communities, finfish communities, entrained plankton, lobster populations, and winter flounder populations. Section 10(A)(2) of the Permit requires an annual report of these studies to be sent to the DEEP Commissioner on or before July 31 of each year. The latest report that fulfills these requirements, "Annual Report 2011 - Monitoring the Marine Environment of Long Island Sound at Millstone Power Station, Waterford, Connecticut" (Annual Report), dated July 2012, presents results from studies performed during construction and operation of MPS, emphasizing those of the latest sampling year. Changes to the biological communities noted in these studies are summarized in the Executive Summary section of the Annual Report, which is attached as part of this report.

   2.2 Effluent Water Quality Monitoring:

   Sections 1 and 5 of the Permit require monitoring and recording of various water quality parameters at MPS intakes and at multiple monitoring points within the plant, including outfalls of each unit to the effluent quarry, and outfall of the quarry to Long Island Sound. Section 8 of the Permit requires that a monthly report of this monitoring be submitted to the DEEP. The report that fulfills these requirements, the "Monthly Discharge Monitoring Report" (DMR), includes discharge data from all MPS units. Consistent with prior annual

AEPPOR submissions, water flow, temperature, pH, and chlorine data pertaining to MPS3 are summarized in Table 1.

Each monthly DMR identifies NPDES permit exceedances (i.e., events where a parameter value was beyond permitted limits) or exceptions (i.e., events where Permit conditions were not met) for the month. During 2012, there were no MPS3 events that were reported as NPDES exceedances. However, one event, although not originating at MPS3, involved an oil sheen to navigable water via a discharge point that is shared by MPS3 (discharge serial number (DSN) 006), and is included for information; the description below is summarized from the September DMR.

a) *Oil Sheen to Navigable Water*

On September 5, 2012, at 1535 hours, a verbal notification to the DEEP Oil and Chemical Spill Section (DEEP Report Number 2012-4848) was made regarding a hydraulic oil spill at MPS which resulted in observed oil sheens in Niantic Bay and Jordan Cove. The total amount of oil spilled was less than one quart.

The oil spill was discovered on September 5, 2012 at 1325 hours, when station personnel found small oil sheens on the roadway and traced them to a forklift truck. Upon further investigation, it was discovered that the forklift truck experienced a mechanical malfunction (steering system hydraulic oil leak) during transit, resulting in the deposition of small droplets of oil along the roadway. Station spill response personnel were called to place sorbent pads to the areas where the oil was observed. Because it was raining, some of the oil moved from the roadway to station stormwater drains that discharge to Niantic Bay and Jordan Cove. Small oil sheens were discovered at the discharges of DSN 006, DSN 009, and DSN 012.

Written follow-up to the Oil and Chemical Spill Section of the DEEP, including a discussion of the corrective actions performed, was forwarded on September 7, 2012.

3. Environmental Protection Plan (EPP) Noncompliances:

   No EPP noncompliances were identified for MPS3 in 2012.

4. Environmentally Significant Changes to Station Design or Operation:

   No MPS3 design change records or system operating procedure changes met the criteria for inclusion in this report, i.e.,

   - No changes were initiated during the report year, or
   - No changes included a determination that a significant unreviewed environmental impact could occur.

5. Non-Routine Reports of Environmentally Significant Events:

   No MPS3 events met the criteria for inclusion in this year's report, i.e.,

   - No events required the submittal of a Licensee Event Report (LER), or
   - No events involved a situation that could result in a significant environmental impact.

Table 1. MPS3 NPDES data summary, Jan 1-Dec 31, 2012. Selected water quality parameters for MPS3[(1)].

2012	Maximum Discharge Flow (10^6 gpd)	Discharge pH Range		Discharge Temp. Range (°F)		Average Discharge Temp. (°F)	Average Delta T (°F)	Maximum FAC (ppm)	Maximum TRC (ppm)	Maximum SWS FAC (ppm)
		Min	Max	Min	Max					
January	1352.3	7.8	8.0	60.3	76.6	65.8	20.4	0.11	<0.02	0.18
February	1362.7	7.8	8.2	57.9	67.1	63.6	20.1	0.09	0.03	0.18
March	1362.6	7.6	8.1	60.9	69.9	63.9	17.9	0.15	0.03	0.19
April	1360.5	7.6	8.2	64.2	90.5	77.1	26.5	0.10	<0.02	0.22
May	1360.4	7.7	8.2	69.4	88.4	79.1	23.3	0.11	0.03	0.18
June	1360.9	7.9	8.2	75.5	86.6	80.7	16.6	0.11	0.05	0.18
July	1360.8	7.9	8.2	82.8	90.2	86.5	16.1	0.10	0.05	0.18
August	1361.1	6.8	8.2	86.2	94.2	89.7	16.5	0.14	0.05	0.18
September	1361.1	7.7	8.1	83.4	93.2	88.3	17.8	0.12	0.03	0.22
October	1360.8	7.8	8.1	71.0	87.0	81.3	17.3	0.09	<0.02	0.19
November	1360.8	7.8	8.0	65.7	78.2	71.9	17.8	0.11	0.02	0.19
December	1360.5	7.8	7.9	61.5	74.1	67.4	19.1	0.13	0.04	0.19

Notes:

(1) Parameters are measured at MPS3 discharge (DSN 001C), except for TRC (total residual chlorine), which is measured at MPS discharge (quarry cuts; DSN 001-1), and SWS FAC (service water system free available chlorine; DSN 001C-5).

Attachment to the
2012 Annual Environmental Protection Plan Operating Report
January 1 – December 31, 2012

Executive Summary Section of
"Annual Report 2011 - Monitoring the Marine Environment of Long Island Sound at Millstone Power Station, Waterford, Connecticut"
dated July 2012

Executive Summary – 2011 Environmental Monitoring Annual Report

Rocky Intertidal Studies

Rocky intertidal monitoring studies during 2011 continued to document ecological changes to the shore community near, and associated with, the Millstone Power Station (MPS) thermal discharge. These changes are not widespread, and remain restricted to approximately 150 m of shore-line on the east side of the power station discharge to Long Island Sound (LIS).

Seasonal shifts in occurrence of annual algal species were noted at Fox Island-Exposed (FE) during 2011. These shifts included abbreviated season for cold-water species (e.g., *Monostroma grevillei, Spongomorpha arcta,* and *Dumontia contorta*) and extended season for warm-water species (e.g., *Grinnellia americana, Dasya baillouviana,* and *Bryopsis hypnoides*). Similar shifts have been observed in most years since Unit 3 began operation (1986), with the exception of the extended shutdown of all MPS Units from March 1996 to June 1998 when seasonality of these species at FE was more typical of other sites.

Thermal effects on dominant species abundance and distribution patterns were also evident at FE in 2011 and most apparent in the low intertidal zone. Seasonally high abundance of *Hypnea musciformis*, a species observed for the first time in 2001, and expanded populations of *Sargassum filipendula, Corallina officinalis*, and *Gelidium pusillum* now characterize the lower shore community at FE. *Neosiphonia* (formerly *Polysiphonia*) *harveyi* maintained a perennial population at FE in 2011, but occurred mainly as a summer annual at sites unaffected by MPS.

Ascophyllum nodosum growth monitoring during 2011-12 continued to demonstrate no clear relationships among monitoring stations, or correlation with station operating conditions, indicating that the thermal plume from MPS has had little effect on local populations. Natural influences of other factors, such as ambient temperature conditions, storms and wave action, nutrients and light, play the dominant role in determining *Ascophyllum* growing conditions in the Millstone area.

The rocky intertidal monitoring program has also documented regional patterns and modifications to shore communities unrelated to MPS operation. These include the introduction to the region of three exotic red algae (*Antithamnion pectinatum* in 1986, *Grateloupia turuturu* in 2004, and *Heterosiphonia japonica* in 2010), decreases in barnacle abundance in recent years, and long-term increases in abundance of the common seaweeds *Fucus vesiculosus* and *Chondrus crispus.*

Eelgrass Studies

Eelgrass (*Zostera marina* L.) populations were monitored from 1985 to 2011 at three locations in the vicinity of MPS. Data from 2011 surveys indicated that at all three study sites supported healthy and expansive eelgrass populations, consistent with results from the past 8-9 years. These populations have also exhibited variability in population parameters (e.g., shoot density, shoot length, and standing stock biomass) and distribution over the entire study period, but this variability was not related to MPS operation. Eelgrass populations at two monitoring sites to the east of MPS (Jordan Cove and White Point) near the fringes of the thermal plume (< 1.5 km from the MPS discharge to LIS) have exhibited moderate variability and subtle declines in some population parameters since 1985. However, both predicted and measured thermal input from the cooling water discharge to these sites is at most minimal (< 1°C above ambient conditions) and well below levels considered stressful to eelgrass.

By comparison, high eelgrass population variability has been observed in the Niantic River, where complete and often sudden eelgrass bed losses were documented on five separate occasions prior to 2000. This estuary is located well beyond (> 2 km) the influence of the MPS discharge. With the exception of a moderate, short-term decline in 2010, eelgrass distribution in the Niantic River has expanded, with a gradual increase in shoot density through 2011. Ongoing extensions of municipal sewerage lines in the Niantic River watershed, possibly coupled with depletion of nutrient inputs from old septic systems no longer in use, may be contributing to population recovery during the last decade, as US Geological Survey studies have noted a general decline in nitrogen loading.

Lobster Studies

Impacts associated with recent MPS operations on the local lobster population were assessed by comparing results of the 2011 study year to data collected from 1978 through 2010. Emphasis has been placed on assessing long-term trends in the abundance and population characteristics of lobsters collected in the Millstone Point area.

Throughout LIS, the lobster population was stable or increasing from 1978 through 1999. The abundance of lobsters in LIS was lower from 2000 to 2011. This decline was unrelated to MPS operations. Rather, the lobster abundance declines were attributed to a significant mortality event in western LIS from which

the lobster population has still not recovered, and to an outbreak of shell disease affecting lobster populations from eastern LIS to the Gulf of Maine. In the MPS area, significant long-term declines were identified in the annual catch-per-unit-effort (CPUE) of lobsters (combined over all sizes and stations) collected both in pots and by trawl. Annual CPUE of legal-size lobster has exhibited significant declining trends at all three sampling stations. Significant declines in the abundance of legal-size lobsters were attributed in part to shell disease and to a 4.7 mm increase in the minimum legal size since 1978.

Long-term trends observed in lobster population characteristics over the past three decades (growth, female maturity and egg-bearing lobsters) appear related to warmer ambient seawater temperatures and/or the recent outbreak of shell disease, and not MPS operation. Increased ambient water temperature may be responsible for the increased susceptibility and transmission of diseases affecting lobsters in LIS, which is at the southern boundary of their range of distribution in nearshore waters.

The number of lobster larvae entrained through the MPS cooling water systems was highly variable and low in recent years due to low adult lobster abundance throughout LIS. Impacts associated with entrainment and impingement of lobsters at MPS have been greatly reduced by the shutdown of Unit 1, which eliminated 23% of the cooling water used, and the installation of aquatic organism return systems at Units 2 and 3, which return impinged lobsters to Niantic Bay.

Benthic Infauna Studies

Benthic infaunal monitoring documented long-term trends in sediment characteristics at all the subtidal sites in the vicinity of MPS. At the effluent station (EF), the sedimentary environment remains coarse, with low silt/clay which is related to discharge of cooling water into LIS at the Quarry cuts. Sediments at the intake station (IN) were consistent with sediment characteristics prior to dredging during MPS Unit 3 construction. Sediments at Jordan Cove (JC) continue to show stabilization following an earlier siltation event when increased water flow from the discharge after startup of MPS Unit 3 scoured fine sediments surrounding EF and deposited them at JC. Sedimentary characteristics at the reference site at Giants Neck (GN) were similar to previous years' observations and continued to reflect natural variability unrelated to MPS.

The 2011 infaunal communities at all sampling sites continued to respond to sedimentary environments. Dominant taxa at all sites were reflective of climax communities that have undergone long-term successional development in response to more stable sedimentary environments. Surface deposit-feeding oligochaetes and polychaetes continued to be dominant organisms at all sites in 2011. Burrowing deposit-feeders and suspension feeders showed increased relative abundance in 2011 compared to previous years at EF. Multi-dimensional-scaling showed distinct separation of communities affected by construction (IN) and initial operation of Unit 3 (JC and EF). Changes in community structure and functional group dominance at subtidal benthic infaunal stations during the period 1980-2011 reflect not only effects related to construction and initial operation of MPS Unit 3, but other regional and/or local biotic and abiotic factors. Community changes at GN during the period 1980-2011 were attributed solely to these latter factors, and not to operation of MPS.

Winter Flounder Studies

Various life history stages of winter flounder have been monitored since 1976 to determine what effect, if any, MPS may have on the local Niantic River population, particularly through the entrainment of larvae. During the past 30 years, annual Niantic River adult winter flounder abundance represented an estimated 0.2 to 3.3% of the total LIS winter flounder resource (mean = 1.23%). Over the past 17 years, low winter flounder abundance levels have been found throughout LIS by the Connecticut Department of Energy and Environmental Protection (CTDEEP). During the same time period, adult winter flounder abundance in the Niantic River has remained low. A total of 22 adult flounder were captured in the 2011 winter flounder spawning survey, including one recapture from 2010. Reflecting these trends of record low abundances, CPUE in 2011 was 0.2 fish per trawl tow, the smallest value of the time-series.

Niantic River female spawner abundance in 2011 was estimated at only 462 fish that produced about 372 million eggs. Previous annual standardized catch estimates ranged from approximately 323 females in 2009 to 77 thousand in 1982 and corresponding total egg production estimates were 0.2 to 44.8 billion.

In 2011, larval abundance in Niantic Bay (Stations EN and NB combined) and Niantic River (Stations A, B, and C) was moderate and the highest at both sites since 2006. Relative to the Niantic River, larval abundance in Niantic Bay has increased in recent years, suggesting higher production in LIS rather than in estuaries such as the Niantic River. In most years since 1995, more Stage 1 larvae were found than expected from low adult spawner abundance,

suggesting a density-dependent compensatory mechanism during the egg stage that enhanced survival. An analysis suggested that mortality decreases with decreasing egg production (a measure of early larval abundance). Larval mortality is also influenced by prevailing water temperatures, with warmer springs allowing for faster development and lower mortality. As expected from low larval abundance in 2011, initial settled juvenile abundance from the juvenile beam trawl survey was low.

The number of larvae entrained at MPS is a measure of potential impact to winter flounder. Annual estimates of entrainment are related to both larval densities in Niantic Bay and MPS cooling-water volume. Avoided entrainment in 2011 can be attributed to the Unit 2 spring refueling outage, as well as from use of the variable frequency drives (VFDs) during the "Interval" (defined in the MPS NPDES permit as the period "from April 4 to May 14 or the first day after May 14 when the intake water temperature reaches 52 °F, whichever is later, but no later than June 5"). The 2011 entrainment estimate of 177.6 million reflected moderate Niantic Bay larval densities. Annual entrainment density (abundance index divided by total seawater volume) has varied without trend since 1976, indicating that larval production and availability in Niantic Bay remained relatively stable despite increased water use during the 1986-95 period of three-unit operation and reduced cooling-water use in 1995-97. Correlations between entrainment estimates and abundance indices of post-entrainment age-0 juveniles were positive. This implies no entrainment effect, as the more larvae that were available for entrainment, the more larvae metamorphosed and settled in Niantic River and Bay. This was also demonstrated by a comparison of annual entrainment and juvenile year-class abundance, which suggested that entrainment estimates were simply a measure of emerging year-class strength. Thus, entrainment is not an important factor in determining juvenile abundance.

Despite a small adult spawning stock in the river, there have nonetheless been relatively large numbers of larvae in several recent years, probably from population compensatory mechanisms and possibly greater contributions from spawners outside of the Niantic River. Processes that are unrelated to MPS operation and which occur after juvenile winter flounder leave shallow nursery waters during the fall of their first year of life seem to be operating to account for fewer adults. A bottleneck in recruitment may occur during the late juvenile life stage (ages-1 and 2), probably from predation. Environmental effects, including changes to the Niantic River habitat (e.g., increased eelgrass abundance), a warming trend in regional seawater temperature, and interactions with other species (e.g., predation), especially during early life history, are also important processes affecting winter flounder population dynamics.

Results from winter flounder studies through 2011 suggest that MPS operations have had minimal effects on winter flounder biomass in the Niantic River. Declines in stock size have been greatly evident on a regional basis, including Long Island Sound, Rhode Island and all other Southern New England waters. Entrainment during the larval life stages of winter flounder occurs, however there has been large variation in the amount of larval mortality and recruitment in recent years, both occurring independently of MPS operations.

Fish Ecology Studies

Monitoring during 2011 indicated that no long-term abundance trends in various life stages of seven selected taxa could be directly related to the operation of MPS. No long-term trend was identified in larval abundance of American sand lance. Since the late 1970s the densities of anchovy eggs and larvae collected in entrainment samples showed significant negative trends. Atlantic menhaden larvae showed a significantly increasing trend in abundance, as did juveniles taken by seine and trawl. No significant long-term trends were detected in populations of juvenile or adult silversides collected by trawl or seine. Grubby larval abundance is increasing and a significant decreasing trend was exhibited for grubby at the Intake trawl station. Although no significant trend was found for the abundance of cunner eggs and larvae, juveniles and adults have become less abundant at the Intake station since the late 1970s and early 1980s. Following the removal of the Unit 3 rock cofferdam, a preferred habitat for cunner, no significant trend was detected in their abundance at Intake. Significant decreasing trends in cunner abundance were also noted in Jordan Cove lobster pot and trawl catches. However, cunner abundance has increased at the Niantic River trawl station. No significant trend was found for tautog eggs but tautog larval abundance has significantly increased over the past 36 years. Juvenile tautog are increasing in abundance at the Niantic River trawl station, but are decreasing at the Intake trawl station, and adults are increasing in Jordan Cove lobster pot catches.

Changes in the species composition and temporal and spatial abundance of fishes and shellfishes collected by trawl over the past 36 years were unrelated to MPS operation. Shifts in the dominance of individual taxa were attributed to changes in

habitat, range extensions or contractions, and a warming trend in ambient seawater temperature that has occurred over the past three decades.

Cooling-water use at MPS was reduced 23% because of the shutdown of Unit 1 in November 1995, resulting in less entrainment and impingement. Fish return systems at Units 2 (2000) and 3 (1986) further reduce impingement mortality at MPS. Further reductions in cooling-water flows during the peak period of winter spawning taxa have been implemented with the use of VFDs during spring refueling outages in accordance with the NPDES permit issued on September 1, 2010. The overall proportion of increasing and unchanging long-term trends suggests that MPS has had minimal, if any, effect on local fish and shellfish assemblages.