**Dominion Nuclear Connecticut, Inc.** Millstone Power Station Rope Ferry Road Waterford, CT 06385



APR 1 2 2012

U.S. Nuclear Regulatory Commission Attention: Document Control Desk Washington, DC 20555-0001 Serial No.12-212MPS Lic/GJCR0Docket No.50-423License No.NPF-49

### DOMINION NUCLEAR CONNECTICUT, INC. MILLSTONE POWER STATION UNIT 3 2011 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, 2011 to December 31, 2011.

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

Sincerely,

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



Enclosures:

Commitments made in this letter: None.

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Serial No. 12-212 Docket No. 50-423 License No. NPF-49

Enclosure 1

## <u>MILLSTONE POWER STATION UNIT 3</u> 2011 ANNUAL ENVIRONMENTAL PROTECTION PLAN OPERATING REPORT JANUARY 1 – DECEMBER 31, 2011

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

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## 2011 Annual Environmental Protection Plan Operating Report (AEPPOR)

1. Introduction:

This report covers the period January 1, 2011 through December 31, 2011. During 2011, Millstone Power Station Unit 3 (MPS3) completed refueling outage 3R14 (October 8 – November 23). Since the refueling outage (through December 31, 2011), MPS3 has operated at a capacity factor of 97.6%; overall capacity for 2011 was 87.6%.

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<sup>st</sup> of each year. The latest report that fulfills these requirements, "Annual Report 2010 - Monitoring the Marine Environment of Long Island Sound at Millstone Power Station. Waterford, Connecticut" (Annual Report), 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 2011, there were no MPS3 events that were reported as NPDES exceedances. However, one event, although originating at Millstone Power Station Unit 2 (MPS2), involved a discharge point that is shared by MPS3, and is included for information; the description below is summarized from the monthly DMR for May.

# a) MPS2 and MPS3 Non-Contaminated Floor Drains (Discharge Serial Number (DSN) 006)

On May 4, 2011 at 1904 hours, the MPS3 Control Room received a computer priority alarm from the continuous pH monitor associated with DSN 006. The pH reading recorded at the time was 8.52 standard units (su). The alarm set point is 8.5 su. DSN 006 is an outfall at MPS, discharging both process water from the plant, and surface water runoff from the yard drain system. Station Chemistry was dispatched to the monitoring point and verified through the grab sample analysis at 1912 hours that the pH had exceeded the Permit limit of 6.0 to 9.0 su. The grab sample result was 9.15 su. At no time during the entire event did the continuous pH monitor associated with DSN 006 exceed the Permit limit, with a highest recorded pH of 8.96 su.

Subsequent pH samples obtained at key inputs to DSN 006 discharge traced the source of the high pH back to the MPS2 East Turbine Building (TB) Sump. During this time, MPS2 was in the process of returning to 100% power after a scheduled refueling outage that ended on May 2, 2011. Earlier in the day, to further enhance condenser vacuum, MPS2 had shifted from the mechanical vacuum pump system to the steam jet air ejector system ("A" train). Initially, the steam trap drain line for the steam jet air ejector (which was later to be discovered to have a faulty steam trap) was aligned to the East TB sump instead of the condenser, as permitted by procedure. An initial pH reading in the East TB sump yielded result of 10.33 su, and at 1948 hours, the associated sump pump was removed from service. To make room in the isolated sump, Operations personnel commenced pumping the East TB sump to totes, with a total of eight totes (approximately 275 gallons each) filled. At 2115 hours, Operations removed from service the "A" steam jet air ejector and placed into service "B" steam jet air ejector. The apparent leakage to the East TB sump was reduced substantially.

After removing the East TB sump from discharging to DSN 006, and allowing for accumulated waters in the yard drain system to slowly drain to DSN 006, the pH gradually returned to its normal range of approximately 7.0 - 7.2 su by 2300 hours. On May 5, 2011, based on updated pH results of the East TB sump, the East TB sump was placed back into service for discharge to DSN 006. Additionally, after testing each of the totes for pH, a determination was made to drain four of the totes back to the MPS2 East TB sump and to process the other four totes for offsite disposal.

The root cause evaluation of this event determined that "system design" does not prevent high pH system water from draining to DSN 006, given that the steam trap associated with the steam jet air ejector had failed during startup of the system, leading to excessive amount of elevated pH (greater than 9.0 su) water to be directed to the East TB sump, and ultimately to DSN 006. Corrective actions for this event include enhancing procedures when starting up the steam jet air ejectors to check for excessive leakage and, if found, to remove the MPS2 East TB sump from discharging to DSN 006; additionally, the MPS3 priority alarm procedure is to be enhanced to ensure all priority alarm notifications are made to the responsible departments in a timely manner.

3. Environmental Protection Plan (EPP) Noncompliances:

No EPP noncompliances were identified for MPS3 in 2011.

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.

Only three licensee events that constituted a reportable occurrence at MPS3 occurred in 2011; none were determined to cause a significant environmental impact.

## Table 1.

MPS3 NPDES data summary, Jan 1-Dec 31, 2011. Selected water quality parameters for MPS3<sup>(1)</sup>.

	Discharge Flow (max) (10 <sup>6</sup> gpd)	Discharge pH Range	Discharge Temp. Range (°F)	Discharge Temp. (avg) (°F)	Avg ∆ T (°F)	Max FAC (ppm)	Max TRC (ppm)	Max SWS FAC (ppm)
Jan.	1360.6	7.8 - 8.1	54.5 - 64.2	58.5	21.2	0.10	0.04	0.20
Feb.	1362.4	7.9 - 8.1	52.6 - 67.7	56.8	21.1	0.11	0.02	0.17
Mar.	1362.5	7.5 - 8.1	53.5 - 64.1	57.9	18.9	0.08	0.02	0.18
Apr.	1360.4	7.6 - 8.1	56.9 - 77.2	69.3	25.5	0.08	0.03	0.22
Мау	1360.0	7.8 - 8.1	69.4 - 85.3	74.0	21.9	0.10	0.03	0.20
June	1361.1	7.3 - 8.5	60.3 - 85.1	78.9	17.6	0.07	0.03	0.18
July	1361.9	7.8 - 8.1	80.6 - 89.0	84.9	16.9	0.06	< 0.02	0.20
Aug.	1361.4	7.7 <b>-</b> 8.1	81.1 - 92.7	87.1	17.2	0.08	0.02	0.22
Sep.	1359.9	7.8 - 8.7	84.4 - 89.8	86.8	18.4	0.07	0.03	0.22
Oct.	1360.4	6.7 - 8.1	54.3 - 86.9	69.0	6.5	0.09	< 0.02	0.17
Nov.	1350.7	7.6 - 8.1	53.4 - 75.5	60.0	5.5	0.07	0.02	0.19
Dec.	1352.3	7.9 - 8.1	65.9 - 79.0	70.5	18.9	0.08	< 0.02	0.19

### Notes:

<sup>(1)</sup> 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).

## Abbreviations Used:

Temp. = Water Temperature

- $\Delta T =$  Delta-T (difference between discharge and intake water temperature)
- FAC = Free Available Chlorine
- TRC = Total Residual Chlorine
- SWS = Service Water System

Attachment to the 2011 Annual Environmental Protection Plan Operating Report January 1 – December 31, 2011

Executive Summary Section of "Annual Report 2010 - Monitoring the Marine Environment of Long Island Sound at Millstone Power Station, Waterford, Connecticut" dated July 2011

## Executive Summary – 2010 Environmental Monitoring Annual Report

### Winter Flounder Studies

Various life history stages of winter flounder have been monitored since 1976 to determine what effect, if any, Millstone Power Station (MPS) may have on the local Niantic River population, particularly through the entrainment of larvae. During the past 29 years, annual Niantic River adult winter flounder abundance represented an estimated 0.4 to 3.3% of the total LIS winter flounder resource (mean = 1.34%). Over the past 16 years, low winter flounder abundance levels have been found throughout Long Island Sound (LIS) by the Connecticut Department of Environmental Protection (CTDEP). During the same time period, adult winter flounder abundance in the Niantic River Reflecting these has remained low. trends, catch-per-unit-effort (CPUE) in 2010 was 0.3 fish per trawl tow, tied with 2009 as the smallest value of the timeseries.

An absolute abundance estimate of the 2009 spawning population (the latest year for which an estimate could be made) using the Jolly model was not calculated due to a lack of recaptures of previously marked fish. Similarly, a lack of recaptures in 2007 precluded an absolute abundance estimate in 2008. The last three absolute abundance estimates from 2004 to 2007 were imprecise, having large 95% confidence intervals, and are not considered reliable.

Using another methodology termed standardized catch, female spawner abundance in 2010 was estimated at only 801 fish that produced about 428 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 2010, overall abundance of winter flounder larvae in the Niantic River was the fifth lowest since 1983 and the Niantic Bay abundance index was the third lowest for the same time series. In most years since 1995, more Stage 1 larvae were found than expected from low adult abundance. suggesting spawner а density-dependent compensatory mechanism during the egg stage that enhanced survival. **Density-dependent** mortality occurs throughout the larval period of life. An analysis suggested that mortality decreases with decreasing egg production (a measure of early larval abundance). Larval mortality is also influenced prevailing water by temperatures, with warmer sprinas allowing for faster development and lower In 2010, Stage 2 larval mortality. abundance was particularly low, indicating high mortality in that stage. In each of the past 3 years, both egg production and Stage 1 larval abundance were low as were the numbers of metamorphosing larvae. However, 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.

Densities of age-0 young in the Niantic River following larval metamorphosis and settlement were linearly related to Stage 4 larval abundance at low to moderate levels. However, at higher larval abundance juvenile densities apparently reached an asymptote of about 250 young per 100 m<sup>2</sup> of bottom, which could represent the carrying capacity of the river As expected from low larval habitat. abundance in 2010, initial settled juvenile abundance was very low.

The number of larvae entrained at MPS is a measure of potential impact to winter flounder. In most years, Stage 3 larvae dominated entrainment collections. Annual estimates of entrainment are related to both larval densities in Niantic Bay and MPS cooling-water volume. With Unit 3 in a spring refueling outage in 2010, the 2010 entrainment estimate of 56.1 million reflected low 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 threeunit operation and reduced cooling-water 1995-97. demand in 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 yearclass 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.

larval The potential impact of entrainment on the Niantic River stock depends upon the fraction of the annual winter flounder reproduction entrained each year (termed production loss in this report), which was calculated as equivalent eggs removed by entrainment. Previous empirical mass-balance model calculations showed that a large number of entrained larvae came from a number of sources in LIS besides the Niantic River. These estimates attributed anywhere from 7 - 61% of entrained larvae to the Niantic River stock.

Despite a small adult spawning stock in the river, there have nonetheless been relatively large numbers of larvae and young fish in several recent years, probably from population compensatory mechanisms and greater possibly contributions from spawners outside of the Niantic River. Relatively good abundance of age-0 winter flounder (a life stage not entrained) occurred in some recent years. yet significant recruitment to the adult spawning population did not occur. Processes that are unrelated to MPS operation and which occur after iuvenile 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 appears to be occurring 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 eelarass abundance), a warming trend in regional seawater temperature, and interactions with other species (e.a., predation), especially during early life history, are also important processes affecting winter flounder population dynamics. Weak year-classes produced in 2006-10 are indications of likely continued low recruitment to the Niantic River spawning population in forthcoming vears.

Results from winter flounder studies through 2010 that MPS suggest 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 amount of larval mortality the and recruitment in recent years, both occurring independently of MPS operations.

#### Fish Ecology Studies

Monitoring during 2010 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. No significant long-term trends were detected in populations of juvenile or adult silversides collected by trawl or seine. Similarly, no long-term trends were found for cunner eggs and larvae, and for tautog Tautog larval abundance has eggs. significantly increased over the past 35 years. Juvenile tautog are increasing in abundance at the Niantic River trawl station, decreasing at the Intake trawl station, and adults are increasing in Jordan Cove lobster pot catches. Juvenile adult cunner have significantly and decreased at the Intake trawl station, but the decline was attributed to the 1983 removal of the Unit 3 intake cofferdam, a preferred reef-like habitat for this species. Since that time, no significant abundance trend was found from 1984 through 2010. Cunner abundance significantly increased at the Niantic River trawl station and continued to fluctuate without trend in Jordan Cove trawls, but decreased in Jordan Cove lobster pots. Grubby larval abundance is increasing and no long-term trend was exhibited in the grubby trawl data. Atlantic menhaden larvae showed a significantly increasing trend in abundance, as did juveniles taken by seine and trawl. Since the late 1970s the densities of anchovy eggs and larvae collected in entrainment samples showed significant negative trends.

Changes in the species composition and temporal and spatial abundance of fishes and shellfishes collected by trawl over the past 35 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 have been implemented at MPS during the peak period of winter flounder annual spawning in accordance with the NPDES permit issued on September 1, 2010. Increasing trends in abundance or the lack of decreasing trends suggests that MPS has had minimal, if any, effect on local fish and shellfish assemblages.

#### **Lobster Studies**

Impacts associated with recent MPS operations on the local lobster population were assessed by comparing results of the 2010 study year to data collected from 1978 through 2009. 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 2010, but unrelated to MPS operations. Rather, the lobster abundance declines were attributed to a significant mortality event in western LIS 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 trends were no identified in the annual CPUE of lobsters (combined over all sizes and stations) collected either in pots or by trawl. The total pot-CPUE of lobsters at the three monitoring stations has varied without trend since 1978. However, annual CPUE of legal-size lobster has exhibited a significant declining trend at the Jordan Cove and Twotree stations, but not at the Intake station located nearby MPS. 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 for the responsible increased susceptibility and transmission of diseases affecting lobsters in LIS, which are near their southern range of distribution in nearshore waters.

The number of lobster larvae entrained through the MPS cooling water systems was highly variable and has not resulted in a decrease in local lobster abundance. 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.

#### **Rocky Intertidal Studies**

Rocky intertidal monitoring studies during 2010 continued to document ecological changes to the shore community near, and associated with, the 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 LIS.

Seasonal shifts in occurrence of annual algal species were noted at Fox Island-Exposed (FE) during 2010. These shifts included abbreviated season for coldwater species (e.g., Monostroma grevillei, Spongomorpha arcta. Dumontia and contorta) and extended season for warmwater species (e.g., Grinnellia americana, baillouviana. Dasva and Brvopsis 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 reactors from March 1996 to June 1998 when seasonality of these species at FE during the recent shutdown period was more typical of other sites.

Thermal effects on dominant species abundance and distribution patterns were also evident at FE in 2010 and most apparent in the low intertidal zone. Seasonally high abundance of Hypnea musciformis, a species observed for the 2001. first time in and expanded populations of Sargassum filipendula, Corallina officinalis, and Gelidium pusillum characterize lower now the shore community at FE. Neosiphonia (formerly Polysiphonia) harveyi maintained а perennial population at FE in 2010, but occurred mainly as a summer annual at sites unaffected by MPS.

Ascophyllum nodosum growth monitoring during 2009-10 continued to demonstrate no clear relationships among monitoring stations, or correlation with plant 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 Ascophyllum determining arowina in 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**

Eelgrass (Zostera marina L.) populations were monitored from 1985 to 2010 at three locations in the vicinity of MPS. Data from 2010 surveys indicated that at all three study sites supported healthy and expansive eelgrass populations, consistent with results from the past 7-8 These populations have also vears. exhibited variability in population parameters (e.g., shoot density, shoot length, and standing stock biomass) and distribution over the entire 26-year study period, but this variability was not related to MPS operation. Eelgrass populations at two monitoring sites to the east of MPS (Jordan Cove - JC and White Point - WP) 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 eelarass.

By comparison, high eelgrass population variability has been observed in the Niantic River (NR), 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. Since 2001. eelgrass distribution in the Niantic River has expanded, with a gradual, steady increase in shoot density through 2009, followed by a moderate decline observed in 2010. extensions of municipal Ongoing 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 9 years.

#### **Benthic Infauna**

Benthic infaunal monitoring documented long-term trends in sediment characteristics at all the subtidal sites in the vicinity of MPS. At the effluent station sedimentary (EF), the 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 MPS Unit 3 construction. durina 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 2010 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 longterm successional development in response to more stable sedimentary

Surface deposit-feeding environments. oligochaetes and polychaetes continued to be dominant organisms at all sites in Multivariate analyses showed a 2010. higher degree of among-station similarity in 2010 than previously observed, but also showed distinct separation of communities when they were affected by construction and initial operation of Unit 3. Changes in community structure and functional group dominance at EF, JC, and IN during the period 1980-2010 reflected a combination of effects related to construction and initial operation of MPS Unit 3 and other regional and/or local biotic and abiotic factors. Community changes at GN the period 1980-2010 durina were attributed solely to these latter factors, and not to operation of MPS. The 2010 benthic corroborate data previous conclusions that operation of the Millstone Power Station does not perturb local benthic infaunal communities.