

Annual Environmental Protection Plan Operating Report
January 1 - December 31, 1987

Millstone Unit 3 Environmental Protection Plan

prepared by
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1. Introduction

This report covers the period January 1 - December 31, 1987. During 1987, Unit 3 was shut down from mid-March to mid-April, for maintenance and snubber inspection, and a refueling outage began on October 31 (completed in February 1988). Except for occasional down-powers, Unit 3 was at nominal full power for the rest of 1987, operating at an annual capacity factor of 67.3% (the overall first-cycle capacity factor was 82%).

As required by Millstone Unit 3 EPP, this Annual Environmental Protection Plan Operating Report (AEPPOR) includes:

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

2. Environmental Protection Activities

2.1 Annual NPDES Report of Ecological Monitoring (EPP Section 4.2)

Paragraph 5 of the referenced NPDES permit requires continuation of biological studies of MNPS supplying and receiving waters, entrainment studies, and intake impingement monitoring. These studies include analyses of intertidal and subtidal benthic communities, finfish communities, entrained plankton, lobster populations, and winter flounder populations. Paragraph 13 of the permit requires an annual report of these studies to the Commissioner of Environmental Protection. The report that fulfills these requirements for 1987, Monitoring the Marine Environment of Long Island Sound at Millstone Nuclear Power Station, Waterford, Connecticut - Annual Report, 1987, presents results from studies performed during 3-unit operation, and compares them to those from 2-unit operation. The added cooling water flow for Unit 3 affects impingement and entrainment, causes sediment scouring near the MNPS discharges, and alters the characteristics of the thermal effluent plume. The biological effects of these changes are discussed in the above-named report (Attachment 1).

2.2 Effluent Water Quality Monitoring

Paragraph 6 of the referenced NPDES permit requires monitoring and recording of many water quality parameters at MNPS intakes and at 37 discharge points within the plant, including outfalls of each unit to the effluent quarry, and outfall of the quarry to Long

Island Sound. Paragraph 11 of the permit requires a monthly report of this monitoring to the Commissioner of Environmental Protection. The report that fulfills these requirements, Monthly Discharge Monitoring Report, includes data from all three Millstone units. Those data that pertain to Unit 3 are summarized in Table 1. The only exception to NPDES permit limits was an oil and grease sample, collected from Discharge Serial No. 006 (combined Unit 2 and Unit 3 non-contaminated floor drains) in January 1987. The reported oil and grease concentration of 20.1 mg/l exceeded the permitted maximum of 20.0 mg/l. This incident will be discussed in further detail in Section 5, Non-Routine Reports.

Sampling for hydrazine (N_2H_4), biological oxygen demand (BOD), and chemical oxygen demand (COD) is required only when discharging wastewater containing hydrazine; these discharges are summarized in Table 2. The major hydrazine discharges at Unit 3 are releases following wet lay-up of steam generators; these occurred in April and November 1987. Some of the values for hydrazine concentration exceeded the administrative target of 125 mg/l, but all were below the NPDES permit level of 200 mg/l. The tests for BOD and COD are unreliable in seawater and it is felt that the reported values for these parameters are not representative of MNPS effluent water quality. NU is investigating the possibility of requesting that CT-DEP eliminate the NPDES monitoring requirements for BOD and COD at MNPS discharges.

3. Environmental Protection Plan Noncompliances

During 1987, no EPP noncompliances were identified for Unit 3. Northeast Utilities has established an Environmental Review Board (ERB), to provide an independent nonrad'ological environmental review of corporate nuclear activities. The ERB responsibilities include an annual audit to assure compliance with the EPP; the reporting deadline for this audit is May 31. If the ERB determines that an audit item constitutes a noncompliance, a supplement to this Annual Environmental Protection Plan Operating Report will be submitted, with a format similar to that of the August 11, 1987 letter, from NNECo to NRC, Supplement to 1986 Annual Environmental Operating Report for Millstone Nuclear Power Station, Unit No. 3. This letter identifies the failure of NNECo to inform NRC within 30 days of the approval for NPDES permit modifications, granted on September 19, 1986, as a 1986 EPP noncompliance. To ensure that similar errors will not occur in the future, procedural changes have been implemented so that copies of all NPDES modification correspondence are sent directly to NRC.

4. Environmentally Significant Changes to Station Design or Operation

During 1987, no Unit 3 Plant Design Change Records (PDCRs) met the acceptance criteria for inclusion in this report, i.e., required an environmental review and received Plant Operation Review Committee (PORC) approval for implementation in 1987. Of the 68 PDCRs initiated during 1987, 37 received PORC approval; none of these involved unreviewed environmental issues. An additional 53 PDCRs, that had been initiated in past years, received PORC approval in 1987; none of these involved

unreviewed environmental issues, either.

Unit 3 has 166 General Operating or System Operating Procedures; of these, 70 were added or revised during 1987. Only 1 required an environmental review: OP 3328B, Chlorination of Circulating Water System. This procedure deals with the injection of sodium hypochlorite solution into the circulating water bays to control microfouling of the condensers; the environmental review and environmental evaluation are attached (Attachment 2). Since the possible need for chlorination was anticipated in the Unit 3 Environmental Report, and provisions to allow it were incorporated into the NPDES permit, it was determined that no unreviewed environmental impact occurred.

5. Non-Routine Reports of Environmentally Significant Events

During 1987, no events occurred at Unit 3 that met the acceptance criteria for inclusion in this report, i.e., required submittal of a Licensee Event Report (LER) from Unit 3, and involved a situation that could result in a significant environmental impact. Of the 51 events that constituted reportable occurrences, none were determined to cause a significant environmental impact. The annual ERB audit will also include review of LERs; if the ERB determines that an unreviewed impact did occur, a supplement to this Annual Environmental Protection Plan Operating Report will be submitted, along with an assessment of the impact.

Although not of sufficient magnitude to require issuance of an LER, two environmentally related incidents occurred during 1987. On January 22, an oil film was noticed near the Unit 3 intakes, and traced to water in the west condenser pit that was pumped out through an oil-water separator at a rate which caused carry-over through the separator. On September 30, a similar sheen was traced to oil found in the Unit 3 turbine building sump. In both cases, the U.S. Coast Guard was notified, as per 10 CFR 50.72 (b)(2)(vi), and on-site materials were used to contain and absorb the spills. No adverse environmental impact occurred.

Table 1. Millstone Unit 3 NPDES Data Summary, Jan. 1 - Dec. 31, 1987¹.

	discharge flow range (10 ³ gpm)	discharge pH range	discharge temp. range (°F)	discharge temp. (avg) (°F)	avg ΔT (°F)	max FAC (ppm)	max TRC (ppm)	settle. solids (mg/l)
Jan.	790-942	7.6-7.9	41.0-65.7	58.8	18.0	< 0.05	< 0.05	< 0.05
Feb.	790-948	7.2-8.0	51.4-57.9	54.8	18.0	< 0.05	< 0.05	< 0.05
Mar.	21-942	6.9-8.1	37.8-59.9	45.8	6.8	< 0.05	< 0.05	< 0.05
Apr.	30-942	6.9-8.0	41.2-69.4	55.3	11.4	< 0.05	< 0.05	< 0.05
May	486-942	7.8-8.0	47.1-75.7	66.0	15.1	0.07	< 0.05	< 0.05
June	638-942	7.7-7.9	55.8-82.0	72.3	13.5	< 0.05	0.08	< 0.05
July	790-942	7.6-7.9	77.7-87.4	82.6	17.9	0.10	0.10	< 0.05
Aug.	790-948	7.3-8.2	82.0-89.6	85.1	17.7	0.08	< 0.05	< 0.05
Sep.	790-948	7.7-7.9	65.5-87.1	82.4	16.7	< 0.05	0.08	< 0.05
Oct.	790-942	7.7-7.9	55.9-82.6	76.4	16.7	0.10	< 0.05	< 0.05
Nov.	15-790	7.4-7.8	44.2-58.5	51.7	0.0	< 0.05	< 0.05	< 0.05
Dec.	182-638	7.7-7.8	33.8-49.6	44.6	0.0	< 0.05	< 0.05	< 0.05

No. of exceptions in year ³	pH	temp.	FAC	TRC	Set. Sol.	Susp. Sol.	BOD ²	COD ²	hydrazine ²	boric acid	conduct.	lithium	oil & grease
0	0	0	0	0	0	0	0	0	0	0	0	0	1

¹ Parameters are measured at Unit 3 discharge, except for TRC and settleable solids, which are measured at MNPS discharge (quarry cuts).

² Sampling for BOD, COD, and hydrazine required only when discharging wastewater containing hydrazine; data for these events are presented in Table 2.

³ Some parameters are measured at more than one point within Unit 3 or only under certain operating conditions. Values represent number of NPDES exceptions for all discharge points.

Table 2. Summary of hydrazine discharges from Unit 3 steam generators, Jan. 1 - Dec. 31, 1987.

Date	Sample pt.	N ₂ H ₄	BOD	COD	(all mg/l)
15 Mar 87	S/G #2	49.0	4.5	5.0	
15 Mar 87	S/G #3	45.0	7.5	10.0	
1 Apr 87	S/G #1	62.5	10.8	34.0	
1 Apr 87	S/G #2	161.5	15.6	104.0	
2 Apr 87	S/G #3	167.0	15.6	121.0	
2 Nov 87	S/G #1	137.0	132.0	165.0	
2 Nov 87	S/G #4	144.0	126.0	97.1	
2 Nov 87	S/G #2	149.0	150.0	77.7	
3 Nov 87	S/G #3	163.0	132.0	< 20.0	

Attachment 2

Environmental Review

OP 3328B

OP 3328B adds a 12.5% sodium hypochlorite (NaOCl) solution at the suction side of each circulating water pump, one at a time, at a flow rate not to exceed 2.6 gpm. The solution will be added at each pump by lifting the deck plate located immediately at the suction side of the pumps and inserting a hose just below the water surface in the intake bay to be treated.

The expected result of the circulating water system (CWS) sodium hypochlorite treatment is that microfouling of the condenser tubes will be reduced. As a result of this tube cleaning process, an improvement in heat transfer capability of the condenser should be observed. The improved heat transfer capability would result in increases in both discharge temperature and temperature difference between intake and discharge. However, the increases only would be to the point of restoring the parameters closer to the original design values. Therefore, the effect on temperatures resulting from the performance of this OP will not change the water temperatures as regulated by the NPDES permit. Chlorine discharges from Millstone are regulated by the station NPDES permit and EPA guidelines (40 CFR 423.13). The NPDES permit limits Unit 3 to a maximum daily concentration of 0.25 ppm free available chlorine (FAC) in the circulating water discharge and the combined effluent from the station cannot exceed 0.10 ppm total residual chlorine (TRC) at the quarry cut. The federal guidelines prohibit discharge of residual chlorine for more than 2 hours per unit per day unless a longer discharge period is demonstrated to be needed for macroinvertebrate (e.g., mussel) control. The latter provision allows continuous chlorination of the service water system but does not allow it for the circulating water system.

To ensure that discharge concentrations are below permit limits, the procedure limits the sodium hypochlorite injection rate to the calculated flow rate (2.6 gpm) to achieve an input concentration of 1.5 ppm FAC in the bay being treated (Reference memo dated August 6, 1987, from J. Foertch to S. Scace, J. Stetz, J. Keenan and C. Clement). By specifying that only one intake bay at a time may be treated and all 6 circulating water pumps must be operating, the dilution factor alone from the other 5 bays will reduce the FAC level to 0.25 ppm. The calculation is conservative in that it assumed no chlorine demand and no formation of combined residual chlorine. Further, the OP specifies that chlorine cannot be discharged from the circulating water system for greater than 2 hours in an 24 hour period to ensure the 40 CFR limit is not exceeded.

As additional assurance that the NPDES limits will not be exceeded, the results of IST 3-87-018 were reviewed. This IST injected sodium hypochlorite into the circulating water system at various controlled flow rates while monitoring FAC and TRC concentrations at the Unit 3 discharge and at the quarry cut to Long Island Sound. The results of the IST verify

that a flow rate not to exceed 2.6 gpm will ensure that FAC and TRC concentrations will remain below the NPDES permit limits.

Based on the preceding discussion, this procedure will not affect the thermal component of the plant discharge or the rate or quantity of radioactive or hazardous materials discharged beyond the limits specified by the NPDES permit. Further, this procedure has no effect on the emissions of air pollutants regulated by the Department of Environmental Protection. Therefore, the implementation of OP 3328B will not constitute an adverse environmental impact.

ENVIRONMENTAL EVALUATION SUMMARY
(Reference NEO 5.14)

<u>Yes</u>	<u>No</u>	
—	<u>✓</u>	1. Will this change affect the water quality characteristics regulated by the NPDES permit.
—	<u>✓</u>	2. Will new discharges regulated by the NPDES permit ^{ba} introduced by this change.
—	<u>✓</u>	3. Will this change introduce a new source or change in the amount or type of fossil fuel burned which would result in a variation of emission of air pollutants under the Regulations of the Connecticut Department of Environmental Protection.
—	<u>✓</u>	4. Will this change cause other adverse environmental impact not currently regulated by NPDES or air pollution regulation (i.e., intake water velocity, wildlife habitat, disruption by construction, etc.)

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