

METROPOLITAN EDISON COMPANY
THREE MILE ISLAND NUCLEAR STATION
1978
ANNUAL ENVIRONMENTAL OPERATING REPORT

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This document and the referenced reports were prepared by the staff of Metropolitan Edison Company and their consultants to fulfill the requirements for an Annual Environmental Operating Report as described in the Three Mile Island Nuclear Station, Unit 2, Environmental Technical Specifications, dated February 8, 1978.

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* "An Ecological Study of the Susquehanna River in the Vicinity of the Three Mile Island Nuclear Station - Annual Report for 1978", Ichthyological Associates, Inc., April 1979.

** "1978 Monitoring of Cooling Tower Operational Effects on Vegetation in the Vicinity of the Three Mile Island Nuclear Station", NUS Corporation, December 1978.

*** "Hydraulic Survey, Three Mile Island Nuclear Station, June 1978", Gilbert Associates, Inc., August 1978.

3.1.1.a.(1) THERMAL CHARACTERISTICS OF COOLING WATER DISCHARGE

In 1978, during normal operation of Three Mile Island Nuclear Station, the temperature of the ambient intake water, the temperature of the discharge water at outfall 001, and the flow rate of the discharge water were continuously monitored. The date, time, temperature, and flow rate were recorded at the station. The minimum, average, and maximum of these temperatures and flow rates are summarized and reported below:

Temperature (°F) of Intake Water

<u>Month</u>	<u>Min.</u>	<u>Ave.</u>	<u>Max.</u>	<u>Month</u>	<u>Min.</u>	<u>Ave.</u>	<u>Max.</u>
Jan.	31.2	34.1	42.5	July	63.5	77.2	87.7
Feb.	32.0	33.0	37.4	Aug.	71.5	77.0	82.9
March	32.5	36.2	42.9	Sept.	63.1	70.8	78.7
April	41.4	48.2	59.1	Oct.	51.2	56.7	63.5
May	52.0	60.5	76.1	Nov.	36.5	47.5	52.3
June	56.9	74.2	82.0	Dec.	31.8	36.1	44.4

Temperature (°F) of Discharge Water

<u>Month</u>	<u>Min.</u>	<u>Ave.</u>	<u>Max.</u>	<u>Month</u>	<u>Min.</u>	<u>Ave.</u>	<u>Max.</u>
Jan.	32.1	36.0	44.6	July	64.8	78.1	89.1
Feb.	32.7	35.7	42.9	Aug.	71.5	78.1	84.5
March	32.6	38.5	46.4	Sept.	59.3	71.5	80.9
April	45.8	50.3	60.7	Oct.	48.8	57.7	68.8
May	52.0	62.5	79.0	Nov.	37.4	49.9	62.1
June	49.6	75.2	83.2	Dec.	33.4	39.9	58.4

Flow Rate (Millions of Gallons Per Day) of Discharge Water

<u>Month</u>	<u>Min.</u>	<u>Ave.</u>	<u>Max.</u>	<u>Month</u>	<u>Min.</u>	<u>Ave.</u>	<u>Max.</u>
Jan.	41.5	52.7	61.9	July	54.5	66.4	75.9
Feb.	41.4	52.7	81.7	Aug.	44.1	53.9	72.9
March	46.3	65.5	96.3	Sept.	27.3	51.7	68.2
April	60.4	70.7	83.9	Oct.	44.3	58.1	75.5
May	52.2	63.3	79.3	Nov.	44.1	72.1	92.2
June	24.1	70.1	96.0	Dec.	47.9	67.2	95.1

An analysis of the thermal data showed that with the exception of one previously reported noncompliance, all of the values (except two) were within the required limits. Two (2) discharge water maximum temperature values appeared to be noncompliances that were not reported. The maximum effluent temperature was 88.0°F ($\Delta T = + 2.4$) on July 21 and 89°F ($\Delta T = + 1.4$) on July 23. The main discharge temperature is not to exceed 87°F except when the ambient river temperature exceeds 87°F in which case the ambient river temperature cannot be exceeded.

In 1978, the date of temperature instrument calibration and the accuracy and sensitivity of the temperature sensors were recorded. There were no occurrences recorded when the sensor system was not functioning or out of calibration.

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3.1.1.a.(2) pH

During 1978, prior to each release or discharge of the contents of the Three Mile Island Nuclear Station, Unit 2, Neutralizer Tank, a sample was taken to the chemistry laboratory where the pH was determined according to an accepted method as described in Standard Methods for the Examination of Water and Waste Water. The date, time, and pH of all samples were recorded on Waste Neutralizing Tank Release Permits. The minimum, average, and maximum of these pH values plus the frequency (number of discharges per month) are summarized and reported below:

<u>Month</u>	<u>Min.</u>	<u>Ave.</u>	<u>Max.</u>	<u>Freq.</u>	<u>Month</u>	<u>Min.</u>	<u>Ave.</u>	<u>Max.</u>	<u>Freq.</u>
Jan.	7.47	8.02	8.53	7	July	No Releases Entire Month			
Feb.	6.78	7.66	8.31	11	Aug.	7.11	7.82	8.33	5
March	7.41	8.06	8.49	27	Sept.	6.81	7.85	8.41	13
Apr.	6.95	7.82	8.46	21	Oct.	7.18	7.99	8.48	17
May	6.75	7.59	8.18	9	Nov.	6.89	7.84	8.50	14
June	7.47	7.60	7.90	3	Dec.	6.93	7.72	8.29	13

An analysis of the data presented showed that all 140 pH values were within the specification range of 6.0 to 9.0.

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3.1.1.a.(3) BIOCIDE

During 1978, when chlorination was being practiced at Three Mile Island Nuclear Station, a grab sample was taken of the station discharge from outfall 001 at a time during the chlorination when the maximum residual chlorine concentration was expected to be present. The sample was taken to the chemistry laboratory where the total residual chlorine concentration in mg/l was determined utilizing an accepted method of the amperometric titration technique as described in Standard Methods for the Examination of Water and Waste Water. The date, time, and total residual chlorine concentration were recorded in the chemistry laboratory log book. The minimum, average, and maximum of these total residual chlorine measurements in mg/l, plus the frequency (number of measurements per month), are summarized and reported below:

<u>Month</u>	<u>Min.</u>	<u>Ave.</u>	<u>Max.</u>	<u>Freq.</u>	<u>Month</u>	<u>Min.</u>	<u>Ave.</u>	<u>Max.</u>	<u>Freq.</u>
Jan.	No Chlorinations	Entire Month			July	0.00	0.00	0.00	5
Feb.	No Chlorinations	Entire Month			Aug.	0.00	0.00	0.00	9
March	No Chlorinations	Entire Month			Sept.	0.00	0.00	0.00	45
Apr.	No Chlorinations	Entire Month			Oct.	0.00	0.00	0.00	90
May	No Chlorinations	Entire Month			Nov.	0.00	0.0015	0.02	54
June	No Chlorinations	Entire Month			Dec.	No Chlorinations	Entire Month		

An analysis of the data presented showed that all of the 203 total residual chlorine measurements resulted in values that were below the limit of 0.2 mg/l.

3.1.1.a.(5) CHEMICAL RELEASE INVENTORY

During 1978, the chemicals used at Three Mile Island Nuclear Station, Unit 2, and discharged to the Susquehanna River aquatic environment, excluding chemicals used in laboratories, were tabulated from station inventory and operating records. The chemical name, the system from which the chemical was released, and the amount of chemical used during the year are summarized and reported below:

<u>Chemical Name</u>	<u>System Released From</u>	<u>Amount Used</u>
Sulfuric Acid (95% by Weight)	Coagulator Building Acid Storage Tank, WT-T-7	424,949 Pounds
Sulfuric Acid (95% by Weight)	Circulating Water Chlorination House Chemical Treatment Acid Storage Tank, CL-T-1	127,047 Pounds
Sodium Hydroxide (50% by Weight)	Coagulator Building Caustic Storage Tank, WT-T-8	203,826 Pounds
Chlorine	Circulating Water Chlorination House Chemical Treatment Chlorine Containers, CL-T-1A through J and CL-T-2A through J.	6,000 Pounds

The amounts of the chemicals used and discharged were less than those addressed in the Final Supplement to the Final Environmental Statement related to operation of the Three Mile Island Nuclear Station, Unit 2, dated December 1976, Docket No. 50-320, U. S. Nuclear Regulatory Commission.

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4.1 RESIDUAL CHLORINE STUDY PROGRAM

During 1978, the Three Mile Island Nuclear Station (TMINS) did not chlorinate above a discharge concentration of 0.2 mg/l total residual chlorine. A residual chlorine study program was not required or performed.

4.4 EROSION CONTROL INSPECTION

On April 18, 1978, May 2, 1978, and May 8, 1978, foot patrol inspections were performed on the transmission line corridors associated with the Three Mile Island Nuclear Station (TMINS). These corridors run from TMINS to the Middletown and Hosensack Substations. No evidence of erosion conditions, associated with transmission line maintenance activities, was found.

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4.5 HERBICIDE APPLICATIONS

During 1978, herbicides were not used in the transmission line corridors associated with the Three Mile Island Nuclear Station.

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4.6.1 UNUSUAL OR IMPORTANT ENVIRONMENTAL EVENTS

All appropriate station and consultant personnel were instructed to notify designated members of the Generation Engineering staff if any unusual or important environmental events were observed. During 1978, no events resulting from the operation of the Three Mile Island Nuclear Station were reported.

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Section 4.6.2 EXCEEDING LIMITS OF OTHER RELEVANT PERMITS

During 1978, 26 noncompliance reports were submitted as required by Three Mile Island NPDES (National Pollution Discharge Elimination System) Permit No. 009920. In order to comply with the requirements of Section 4.6.2 of the TMI-2 Environmental Technical Specifications, copies of all the noncompliance reports, numbered 78-01 through 78-26, were sent to the NRC.

The IWFS (Industrial Waste Filter System), NPDES discharge 104, had 13 noncompliances. Five of these noncompliances (78-01, 78-03, 78-10, 78-12, and 78-14) occurred prior to the June 1, 1978 start-up of the IWFS. Despite the fact that interim treatment measures were being employed, the lack of an operational treatment system accounted for these noncompliances. Subsequent to the start-up of the IWFS, an additional eight noncompliances (78-17, 78-18, 78-19, 78-21, 78-22, 78-23, 78-25, and 78-26) occurred. Noncompliance incident numbers 78-21 and 78-22 occurred as a result of operator error. The necessary procedural/supervisory steps have been taken to preclude future occurrences of this nature. The remaining IWFS noncompliances all occurred as a direct result of the inordinate amount of problems encountered with the various components of the IWFS. Met-Ed has been, and still is, making every effort to resolve all operational problems with the IWFS vendor. It should be noted that since the June 1, 1978 IWFS start-up, numerous modifications to the system have been made, and will continue to be made, until all problems are overcome.

The IWTS (Industrial Waste Treatment System), NPDES discharge 107 had eleven noncompliances (78-02, 78-04, 78-05, 78-06, 78-07, 78-08, 78-09, 78-11, 78-13, 78-15, and 78-16). With the exception of noncompliances 78-02 and 78-04, the IWTS noncompliances resulted from problems with the air floatation system and the pressure sand filters. These problems have been corrected by performing the necessary system modifications. Noncompliance 78-02 was caused by the inadvertent running of a temporary pump. As a corrective action, the temporary pump was removed. Noncompliance 78-04 was believed to have been caused by a rusty pipe. To preclude further such incidents, fire hosing, which does not rust, is being used instead of the pipe in question.

The Unit 1 Neutralizer Tank, NPDES discharge number 105, had one noncompliance which was numbered 78-20. This noncompliance occurred as a result of inadequate procedural control. The neutralizer tank operating procedure has since been modified accordingly.

The main plant discharge, NPDES discharge 001, exceeded thermal limits once, as reported in notification 78-24. This incident was caused by unusual atmospheric conditions rather than a deficiency with the Mechanical Draft Cooling Towers. This incident required no follow-up corrective actions. This occurrence was also reported separately to the NRC through the submittal of License Event Report 78-31/4T.

5.5.1 ENVIRONMENTAL PROGRAM DESCRIPTION DOCUMENT

The Environmental Program Description Document (EPDD) consists of portions of a series of procedures covering the programs required by Sections 3.1 and 4 of the Three Mile Island Station Unit 2 Environmental Technical Specifications. These procedures were developed in 1977 and first utilized in conducting the 1978 environmental monitoring program. After initial implementation, it was determined that some changes were necessary to clarify, edit, or improve these procedures. The following table lists these procedures and indicates which ones have been revised.

The majority of the EPDD changes that were approved in 1978 were editorial in nature. The remaining changes were made to clarify or improve the procedures.

Each change, prior to implementation, was reviewed to ensure that an unreviewed environmental question was not involved, the objectives of the present ETS were not changed, and program consistency with initially approved procedures was maintained. The revisions were also reviewed to ensure that sampling frequency and sample location, gear, and replication were not changed.

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ENVIRONMENTAL PROGRAM DESCRIPTION DOCUMENT

<u>Environmental Technical Specification Section</u>	<u>Procedure Title</u>	<u>Procedure Number</u>	<u>Current Revision Number</u>
3.1.1.a (1-3) & (5)	Temperature, pH, Biocide, and Chemical Release Inventory	GP 1448	0
3.1.1.a (4)	Water Quality Analysis	GP 1449	1
3.1.2.a (1) (a)	Benthic Macroinvertebrates	GP 1450	1
3.1.2.a (1) (b)	Ichthyoplankton	GP 1451	1
3.1.2.a (1) (c)	Fish	GP 1452	1
3.1.2.a (1) (c) (inpart)	Creel Survey	GP 1476	1
3.1.2.a (2)	Impingement of Organisms	GP 1453	1
3.1.2.a (3)	Entrainment of Ichthyoplankton	GP 1454	1
3.1.2.b (1)	Aerial Remote Sensing	GP 1456	1
4.1	Residual Chlorine Study Program	GP 1448 (page 6)	0
4.2	Thermal Plume Mapping	GP 1458	1
4.3	Hydraulic Effects	GP 1459	1
4.4	Erosion Control Inspection	GP 1460	0
4.5	Herbicide Applications	GP 1461	0
4.6.1	Unusual or Important Events	GP 1473	0
4.6.2	NRC Nonroutine Reports	GP 0004	0
Special Condition	Comparison of Ichthyoplankton Sampling Gear	GP 1474	0

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5.5.4 CHANGES IN PROCEDURES, STATION DESIGN, OR OPERATION

During 1978, all proposed changes in procedures, station design, or operation were reviewed for potential environmental impact under the direction of the Manager-Generation Quality Assurance. The reviews ensured that no changes, which could involve an adverse environmental impact, or which could change the findings of the FSFES, were implemented.

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5.7.1 CHANGES MADE TO ENVIRONMENTAL TECHNICAL SPECIFICATIONS

During 1978, only one change was made to the TMI-2 Environmental Technical Specifications (ETS). On May 19, 1978, Technical Specification Change Request (TSCR) No. 006 was forwarded to the Nuclear Regulatory Commission (NRC). Part A of TSCR #006 dealt with a change to page 2-3 of the TMI-2 ETS. The requested change involved the deletion of a comment which had been made during the time when the TMI-2 ETS were being developed. This comment had inadvertently been included in the body of the TMI-2 ETS. TSCR #006 indicated that the deletion of this comment would not change any effluent limitation, limiting condition for operation or operational procedure.

On September 5, 1978, the NRC issued Amendment No. 7 to the TMI-2 Operating License. This Amendment effected the change requested in TSCR #006A.

5.7.2 CHANGES IN PERMITS AND CERTIFICATIONS

During 1978, Pennsylvania Department of Environmental Resources (PaDER) Industrial Waste Permit No. 2277206 was issued. In addition, an application to amend NPDES Permit No. 009920 was sent to the Environmental Protection Agency.

The PaDER permit was issued in order that the thermal component of the Mechanical Draft Cooling Towers discharge would meet Pennsylvania Water Quality Criteria. It is our estimation that because this permit was issued by the proper regulatory authority, after the appropriate review, that the requirements of this permit will insure minimal environmental impact.

The application to amend the NPDES permit requests authorization to discharge wastewater from the construction runoff collection system. The application for this amendment is still pending final review. The fact that virtually no construction runoff has been discharged from this outfall indicates that there is little or no environmental impact. Also, issuance of a permit limitation will insure minimal impact to the environment.

Copies of both the permit and permit application were sent to the NRC.