

POOR ORIGINAL

U. S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT  
REGION I

Inspection Report No: 50-289/75-21 and 50-320/75-12

Docket No: 50-289  
50-320

Licensee: Metropolitan Edison Company

License No: DPR-50  
CPPR-66

P. O. Box 542

Priority: \_\_\_\_\_

Reading, Pennsylvania 19603

Category: C  
A

Location: Three Mile Island Nuclear Station - Units 1 and 2,  
(TMI-1, TMI-2) Middletown, Pennsylvania

Safeguards  
Group: \_\_\_\_\_

Type of Licensee: Unit 1 - PWR (B&W), 2535 MW(t)  
Unit 2 - PWR (B&W), 2772 MW(t)

Reason for Inspection: Unannounced, Environmental Monitoring  
Unit 1, Special - Unit 2, Routine

Date of Inspection: September 17-19, 1975

Dates of Previous Inspection: August 27-29, 1975

Reporting Inspector: *R. J. Bores*  
R. J. Bores, Radiation Specialist

10-10-75  
DATE

Accompanying Inspectors: NONE

DATE

DATE

DATE

Other Accompanying Personnel: NONE

DATE

Reviewed By: *J. P. Stehr*  
J. P. Stehr, Senior Environmental Scientist

10/16/75  
DATE

1586 059

7911110/37

SUMMARY OF FINDINGS

Enforcement Action (Environmental Monitoring)

A. Items of Noncompliance

1. Violations

None

2. Infractions

None

3. Deficiencies

Contrary to Section 5.6.c of the Appendix B, Technical Specifications (T.S.) for TMI-1, telephone and telegraph notifications were not made to the NRC within 24 hours on two occasions in which a Limiting Condition for Operation was exceeded, and the required written reports were not submitted within 7 days of the events. (Details, Paragraph 7)

B. Deviations

None

Licensee Action on Previously Identified Enforcement Action (Environmental Monitoring)

The licensee's corrective actions as submitted in a letter dated January 20, 1975, to the USNRC, Region I, in response to items of noncompliance identified in the AEC-RO:I letter of December 20, 1974 and in the AEC-RO Inspection Report No. 50-289/74-34 were reviewed during this inspection. The inspector had no further questions in these matters. (Details, Paragraph 4.a)

Design Changes

None

Unusual Occurrences

1. Total residual chlorine in the plant river discharge in excess of the limits specified by Section 2.2.1.a of the Appendix B, T.S. for

1586 060

TMI-1 was reported to the Commission by the licensee on the following occasions as Environmental Incidents:

EI 50-289/75-01	January 24, 1975	letter dated January 31, 1975
EI 50-289/75-02	April 13, 1975	April 18, 1975

(Details, Paragraph 6.a.)

2. Total residual chlorine at the plant river discharge in excess of 0.01 ppm for more than two hours on April 17, 1975, in noncompliance with Section 2.2.1.c of the Appendix B, T.S. for TMI-1 was reported by the licensee in a letter as EI 50-289/75-03, dated April 24, 1975. (Details, Paragraph 6.a.)
3. Suspended solids in the plant river water discharge on June 6, 1975, in excess of the Section 2.2.2 of the Appendix B, T.S. for TMI-1 limits during the release of a waste neutralizing tank was reported in a letter to the NRC as EI 50-289/75-04. (Details, Paragraph 6.b.)
4. Failure to monitor effluents prior to discharge as required by the Appendix B, T.S. TMI-1 Environmental Monitoring Requirements to ensure compliance with Sections 2.2.2 and 2.2.3 on August 2, 1975 was reported by letter to the NRC as EI 50-289/75-05 on August 9, 1975. (Details, Paragraph 6.b.)
5. Dissolved solids in the plant water discharge on August 4, 1975 in excess of the Section 2.2.2 Appendix B, T.S. TMI-1 limits was reported by letter to the NRC as EI 50-289/75-06 on August 9, 1975. (Details, Paragraph 6.b.)
6. Plant river water discharge temperatures in excess of the 30°F Section 2.1.9.(1) Appendix B, T.S. TMI-1 limit below the inlet water temperature was reported by letter to the NRC on the following occasions as Environmental Incidents:

EI 50-289/75-07	August 3, 1975	letter dated August 22, 1975
EI-50-289/75-08	August 26, 1975	September 3, 1975

(Details, Paragraph 6.c.)

The inspector examined the circumstances surrounding each of the above reported Environmental Incidents and reviewed the licensee's

1586 061

actions to correct the noncompliance and prevent its recurrence. The inspector had no further questions in these matters. (See Infractions and Deficiencies Identified by the Licensee, Deficiencies - Items 1-6).

7. Tritium concentrations in surface water samples collected downstream from the TMI-1 discharge in excess of four times or ten times the control station values were reported to the NRC by letter as required by Section 5.6.2.b of the Appendix B, T.S. TMI-1 on the following occasions:

Nonroutine 30-Day Environmental Report 74-02 dated December 24, 1974  
Nonroutine 30-Day Environmental Report 75-01 dated April 18, 1975  
Nonroutine 7-Day Environmental Report 75-01 dated May 23, 1975  
Nonroutine 30-Day Environmental Report 75-02 dated August 18, 1975

The inspector reviewed the licensee's sampling and analytical program as related to the above reports and also reviewed the liquid discharges from TMI-1 in conjunction with the sampling program. The inspector stated that he had no further questions with respect to the reported tritium levels at this time. (Details, Paragraph 4.b.)

Other Significant Findings (Environmental Monitoring)

A. Current Findings

1. Unresolved Items

None

2. Infractions and Deficiencies Identified by Licensee

a. Infractions

None

b. Deficiencies

- (1) Total residual chlorine in discharge in excess of Section 2.2.1.a Appendix B, T.S. limits. (Item 1, Unusual Occurrences)
- (2) Total residual chlorine greater than 0.01 ppm in discharge for more than two hours per day as limited

1586 062

by Section 2.2.1.c, Appendix B, T.S. (Item 2, Unusual Occurrences)

- (3) Suspended solids in discharge in excess of the Section 2.2.2 of Appendix B, T.S. limits. (Item 3, Unusual Occurrences)
- (4) Failure to monitor effluents prior to discharge as required to ensure compliance with Sections 2.2.2 and 2.2.3 of the Appendix B, T.S. (Item 4, Unusual Occurrences)
- (5) Dissolved solids in discharge in excess of the Section 2.2.2 Appendix B, T.S. limits. (Item 5, Unusual Occurrences)
- (6) Plant river discharge temperature in excess of the 30°F, section 2.1.a.(1), Appendix B, T.S. limit below plant intake water temperature. (Item 6, Unusual Occurrences)

B. Status of Previously Reported Unresolved Items

None Reported.

Management Interview

On September 19, 1975, following the inspection, a meeting was held at Three Mile Island Nuclear Station. The following individuals attended:

- R. J. Bores, Radiation Specialist, USNRC, Region I
- J. G. Herbein, Manager, Generation Operations - Nuclear, Met-Ed (TMI)
- J. J. Colitz, Station Superintendent - Unit 1, Met-Ed (TMI)
- J. E. Romanski, Supervisor - Radiation Protection & Chemistry, Met-Ed (TMI)
- T. A. Jenckes, Radiation Safety and Environmental Engineer (RS&EE), Met-Ed (TMI)
- M. R. Buring, RS&EE, Met-Ed (Reading)

During this meeting the following items were discussed:

A. General

The inspector stated that this was a special environmental inspection for TMI-1 to review the previously identified items of non-compliance and the reported Environmental Incidents since the last

1586 003

environmental inspection of the facility in December, 1974. The inspector stated that this inspection did not involve the statistical sampling portion of the Sandia Inspection Program at TMI-1. The inspection of TMI-2 which was conducted concurrently was part of the routine inspection program for that facility.

B. Reported Environmental Incidents (TMI-1)

The inspector stated that he reviewed each of the reported Environmental Incidents, EI 50-289/75-01 through EI 50-289/75-08 and examined the licensee's corrective actions with respect to each.

1. Chlorine

The licensee stated that the special chlorine study at TMI had just ended on September 15, 1975, and that the results of that program have not yet been reviewed. The licensee expected that some changes in the chlorination regime and/or monitoring requirements may result. (Details, Paragraph 6.a.)

2. Additional Training

The licensee stated that additional training was being given to personnel regarding the requirements of the Appendix B, Technical Specifications and the procedural modifications implemented to prevent recurrence of Environmental Incidents. The licensee stated that this training would be completed in October, 1975. (Details, Paragraphs 6.b. and 6.c.)

3. Timeliness of Reports

The inspector stated that two of the reported Environmental Incidents, EI 50-289/75-04 and EI 50-289/75-07, were not reported to the NRC by telephone and telegraph within the required 24 hours, nor were the corresponding 7-day written reports submitted within the required time frame. The inspector stated that this was in noncompliance with Section 5.6.c of the Appendix B, Technical Specifications. (Details, Paragraph 7)

C. Nonroutine Environmental Reports

The inspector stated that he reviewed the circumstances surrounding each of the four nonroutine environmental reports dealing with tritium concentrations downstream that were in excess of four times

1586 064

or ten times the control levels. The inspector stated that he also reviewed the liquid waste discharges during the periods of higher reported activities and the method of sampling the surface water. Further, the inspector stated that the present method of sampling did not appear to assure that the measured tritium levels were representative of the river flowing past the sampling location throughout the month. More frequent sampling at a location to give a larger number of samples per monthly composite was discussed as a method of obtaining more representative samples. The licensee stated that this would be evaluated.

The inspector also discussed with the licensee the method used by the licensee in establishing the "control station value" which was used to determine the reporting level for a given sample. The inspector stated that the "control station value" implied that level of activity measured at the upstream station during the sampling period as opposed to the "mean activity level for all samples measured to date". The licensee stated that the term "control station value" would be re-examined. (Details, Paragraph 4.b.)

D. Radiological Sampling, Analysis and Related Quality Control

The inspector discussed the following areas with the licensee:

1. The use of HCl and NaHSO<sub>3</sub> in water samples to prevent selective ion plate-out on container walls and to retain volatile components in the sample. The licensee stated that this area was evaluated but that would be reviewed in conjunction with a study program conducted by a Met-Ed vendor.
2. The acquisition and documentation of sufficient analytical data (background rates, chemical yields, and other pertinent parameters) to assure that required analytical sensitivities are met. The licensee stated that this would be pursued with their contractor.
3. The use of "low level spiked samples" supplied as "blind" samples for analysis. The licensee stated that at present the preparation of such samples is difficult because of lack of an adequate place to prepare them. The licensee stated that General Public Utilities (GPU) was building new laboratory facilities and the possibility of GPU supplying the Quality Control samples for all GPU served utilities was discussed. The licensee stated that this item would be evaluated with GPU.

(Details, Paragraph 5)

1586 065

E. Transformer Slag Pits

The inspector stated that during the TMI-1 and TMI-2 site tours, he noted that the station transformers were situated over slag pits surrounded by concrete vaults. The inspector inquired as to the method of routine drainage of rain water from these vaults to assure sufficient capacity to contain all the transformer oil in the event of a major spill. The licensee was not aware of any surveillance procedure in this matter, nor whether routine drainage was required. The licensee stated that this would be pursued and appropriate action would be taken. (Details, Paragraph 8)

1586 066



## DETAILS

### 1. Individuals Contacted

#### Metropolitan Edison

J. G. Herbein, Manager, Generation Operations - Nuclear, TMI  
J. J. Colitz, Station Superintendent - Unit 1, TMI  
J. E. Romanski, Supervisor, Radiation Protection & Chemistry, TMI  
G. A. Kunder, Supervisor, Operations - Unit 1, TMI  
T. A. Jenckes, Radiation Safety & Environmental Engineer, Reading  
M. R. Buring, Radiation Safety & Environmental Engineer, Reading  
R. W. Dubiel, Project Engineer, TMI  
J. G. Reed, Acting Chemistry Supervisor, TMI

### 2. General

The special environmental inspection of TMI-1 was conducted to review the status and corrective actions relative to previously identified noncompliance items and the reported Environmental Incidents, EI 50-289/75-01 through EI 50-289/75-08. The inspector also reviewed the circumstances relative to the elevated H-3 concentrations downstream of the plant discharge and reported by the licensee as NonRoutine 30 Day Environmental Reports 74-2, 75-1 and 75-2 and NonRoutine 7 Day Report 75-1.

The environmental inspection at TMI-2 was a routine review of the controls exercised by the licensee over the environmental impacts during the construction of the station. The requirements in this area are contained in the Construction Permit CPPR-66.

The inspection consisted of a selective examination of sampling and analytical instrumentation, sampling and analytical procedures, records and reports, interviews with personnel and observations by the inspector.

### 3. Organization and Administration

The inspector reviewed the organization and administration of the environmental programs at TMI. The inspector determined that this area was essentially unchanged from that reported at the last

1586 067

inspection of this area. (See AEC-RO Inspection Report 50-289/74-34) The licensee stated that Mr. Romanski (now the Radiation Protection and Chemistry Supervisor) has the responsibility for routinely assuring that the construction activities do not cause unnecessary environmental impact. The licensee further stated that the Operations Department personnel perform at least weekly observations of the site for evidence of oil spills, flooding, erosion, etc.

4. Radiological Environmental Monitoring

a. Milk

The inspector reviewed the licensee's corrective actions as described in the letter to the Commission, dated January 20, 1975, in response to items of noncompliance identified in the AEC-RO:I letter of December 20, 1974 and the AEC-RO Inspection Report No. 50-289/74-34 as related to the sampling and analysis of milk. The inspector stated that he had no further questions in this matter.

The inspector examined the results of the milk monitoring program since November, 1974 and noted that all analyses for I-131 were performed within the required 8 days of sampling and that the sensitivity of analysis was greater than the minimum required, i.e.,  $0.5 \pm 25\%$  pCi/liter at time of sampling. The review of the data indicated the typical minimum sensitivity for I-131 was 0.04 to 0.1 pCi/l. The review of the data indicated all the required analyses were performed.

b. Tritium Monitoring in Surface Waters

Section 4.4.a, Table 3 of the Appendix B, T.S. for TMI-1 requires that surface water sampled at the upstream, two downstream stations and at the City of Columbia be composited for quarterly tritium analyses at each location. Section 5.6.2 of the Appendix B, T.S. states, in part, that if a measured level of radioactivity in any environmental medium other than gaseous exceeds 10 times the "control station value", a written notification will be submitted to the Commission within one week; if a measured level exceeds 4 times the "control station value", written notification to the Commission will be submitted within 30 days.

1586 068

Based on the above requirements, the licensee has submitted a number of such notifications since the last inspection of this area. The inspector reviewed each of these incidents as identified in the SUMMARY OF FINDINGS, Unusual Occurrences, Item 7 of this report. In addition, the inspector reviewed in detail the licensee's river sampling program, the liquid discharge records, and the licensee's evaluation of each event.

The licensee currently obtains daily grab samples of the river water at the upstream (background) station, at the City of Columbia water treatment plant and at Brunner Island. These daily samples are composited to form monthly composites for tritium analyses. The two locations downstream of the TMI discharge, off of Three Mile Island, are sampled on a weekly basis, with the four weekly grab samples composited for monthly analyses.

The inspector noted that the reported elevated tritium levels were found at the latter two locations. The licensee stated that the discharge outfall water followed the shore line of Three Mile Island to the southern tip and that mixing with the river volume occurred only at the York Haven Dam, further downstream. Thus, the surface water sampled at these two downstream stations consisted of plant discharge water essentially undiluted by the volume of river water flowing past the plant.

The inspector also determined that the reported elevated tritium levels occurred only when one or more of the weekly grab samples of the monthly composite were taken during a liquid discharge from the plant. From the review of the release records, it was determined that the weekly grab samples did not represent the activity levels present at the sampling location throughout the month. Sometimes none of the grab samples were taken during a discharge so the composite indicated background concentrations of tritium. At other times one or more of the grab samples were taken during a discharge so that the tritium levels appeared unusually high. Neither case appeared to be representative of the flow averaged tritium concentration at the sampling location. An increase in sampling frequencies at the above locations was discussed with the licensee as a means of obtaining more representative samples. The licensee stated that the use of an automatic

1586 069

composite sampler was considered but the lack of electrical power in the area was an economic consideration. The licensee stated that the use of daily grab samples and/or the automatic samples would be reconsidered and appropriate action would be taken.

The inspector discussed with the licensee the current method used by the licensee in determining whether a particular measured activity value was four times or ten times the "control station value". The licensee presently defined the "control station value" as the average preoperational activity level for that particular media and activity. The inspector stated that the "control station value" is generally interpreted as that activity level in that media as measured outside the area of the plant influence. That is, in the case of H-3 in river water, the "control station value" is that H-3 concentration measured at the upstream sampling station for that particular sampling period. The inspector noted that the same nonroutine reports would have been required under either criteria. The licensee stated the definition of the "control station value" would be reviewed and made consistent with the general interpretation.

The inspector reviewed the levels of the reported releases, the quantities of H-3 released by TMI-1, and the licensee's evaluation of the radiological impacts. The inspector reviewed the licensee's evaluation that no health and safety questions were involved in that (1) the maximum levels reported were no more than 2% of the MPC, (2) the location sampled was not representative of the river concentrations, the latter being much lower, (3) the grab samples were not representative of the water at the sampling location during the month, and (4) the discharge levels were much lower than the applicable limits. The inspector had no questions with this evaluation. The licensee recently installed a composite sampler at the discharge pit in a further attempt to quantify the average release levels of H-3 prior to dilution in the river. No noncompliance nor deviations were noted.

5. Radiological Sampling, Analyses and Related Quality Control

- a. The inspector discussed with the licensee the use of HCl and NaHSO<sub>3</sub> in water samples to prevent the selective plate-out of ions to the container walls and the loss of volatile components. The licensee stated that after evaluating the use of the above substances, it was decided not to use the additives.

1586 070

The licensee stated, however, that the results of a study currently being performed by their contractor would be reviewed and reconsideration would be given in this area.

- b. The inspector discussed with the licensee the use of "low level spiked samples" to aid in evaluating the quality of the analytical performance. The licensee stated that at present it was difficult to submit such samples as "blind samples" because of inadequate facilities outside the plant to prepare the samples. The licensee stated that General Public Utilities (GPU) was creating new laboratory space. The possibility of having GPU supply all the Quality Control samples for all the GPU served utilities was discussed. The licensee stated that this would be pursued with GPU.
- c. The inspector discussed with the licensee the types of data needed to assure that the sensitivities of analyses meet those required by Section 4.4.a, Table 3 of the Appendix B, T.S. The types of required information that were discussed included: the detailed analytical procedures, counting dates, times, chemical yields (if appropriate), volumes, backgrounds, efficiencies, etc. Methods and frequencies of verifying the analytical sensitivities were discussed. The licensee stated that this would be pursued.

6. Nonradiological Monitoring of Effluents

a. Chlorine

The licensee reported total chlorine residuals in the plant water discharge in excess of the 0.2 ppm limit on two occasions (EI 75-1 and EI 75-2) and the total chlorine residuals in the discharge greater than 0.01 ppm for longer than two hours on one occasion (EI 75-3). The inspector reviewed the corrective actions taken by the licensee as stated in the licensee's reports of those events. With respect to EI 75-1 and EI 75-2, the licensee stated that the 90-day study was just concluded on September 15, 1975, and the final results were not yet available. This study will be used to determine an optimum chlorination program to maintain biological plant cleanliness at minimum environmental expense, to better correlate the chlorine demand with river conditions and plant requirements and to better understand the chlorine levels in the circulation water to various points in the

1586 071

plant and at the plant discharge during chlorination. The licensee stated that the review of this study and any resulting chlorination procedural change recommendations would not be completed until about January 1976.

The licensee stated that the continuous chlorine monitor at the plant discharge monitoring pit was a continuing source of calibration problems. The licensee stated that the monitor is calibrated daily but that it shifts out of calibration between each chlorination. The licensee is evaluating several other models of chlorine monitors to remedy this problem. Meanwhile, grab samples of discharge water are analyzed with a portable amperometric titrator as required when the continuous monitor is out of service. The review of the chlorine analysis indicated no other chlorine levels in excess of the limits.

With respect to EI 75-3, the licensee has modified the storage area and storage procedures to assure that chemical supplies, including carboys of sodium hypochlorite, are stored such that their contents will not end up on the plant discharge water in the event of a spill or broken container. The inspector stated that he had no further questions in the above matters at this time.

b. Solids in Plant Effluents

The licensee reported three Environmental Incidents since the last inspection relative to solids in plant effluents. The inspector reviewed each incident and the resulting corrective actions, as appropriate.

EI 75-4 resulted when the suspended solids in the plant effluents exceeded the Section 2.2.2, Appendix B, T.S. limits during the discharge of a water neutralizer tank. This resulted in procedural changes which require, in part, better communications between Operations and the Radiation Protection and Chemistry Departments.

EI 75-5 was a result of failure to monitor the effluents for chemical parameters required by Sections 2.2.2 and 2.2.3 of the Appendix B, T.S. Corrective actions in this matter are primarily geared to the increased training of personnel involved in the requirements of the Appendix B, T.S. The licensee stated that this training should be completed by the end of October, 1975.

1586 072

EI 75-6 was a result of unusual river conditions such that the dissolved solids in the intake water exceeded the allowable discharge limits. The plant river discharge concentrations, thus exceeded the Section 2.2.2 Appendix B, T.S. limits. The licensee is planning a T.S. change in this regard to take into account unusual river conditions. The inspector had no further questions with regard to the above matters at this time.

c. Temperature of Plant Discharge Water

The licensee reported two occasions in which the plant river discharge temperatures were more than 3°F below the river intake temperatures in noncompliance with Section 2.1.9.(1) of the Appendix B, T.S.

EI 75-7 resulted when an operator adjusted the mechanical cooling tower operation while trying to maintain the plant effluent temperature differences between 0°F and 3°F as required when the river temperatures exceed 87°F. The licensee has issued further guidance to the operators for cooling tower operations and made procedural modifications requiring closer observance of this operation.

EI 75-8 resulted when ambient atmospheric conditions changed too rapidly to allow corresponding cooling tower operations to follow during the approach of a storm. The licensee may request a T.S. change to allow for such temporary changes. The inspector had no further questions in the above matters at this time.

7. Timeliness of Reports

Section 5.6.c of the Appendix B, T.S. requires that in the event a Limiting Condition of Operation is exceeded, notification must be made to the Commission within 24 hours by telephone and telegraph and this is to be followed by a written report within 7 days.

The inspector determined that on two occasions, EI 50-289/75-04 and EI 50-289/75-07, the initial notification was received by the Commission approximately 27 days and 12 days, respectively, after the Limiting Condition of Operation was exceeded. The followup reports were submitted within 7 days after the initial notifications. The inspector stated that these notifications and reports were not submitted within the required time intervals and that this was in noncompliance with the T.S.

1586 073

8. Transformer Slag Pits

During the tour of the TMI-1 and TMI-2 sites, the inspector noted that the station transformers were located over slag pits surrounded by concrete vaults. The inspector inquired as to the method of assuring the vaults do not fill with water from precipitation, thereby, reducing their capacity to contain transformer oil in the event of a major spill or transformer rupture. The licensee was unable to determine if a maintenance procedure or surveillance procedure was used to periodically check the level of water in the vaults. The licensee stated that the construction of these vaults would be reviewed to determine if provisions were made for draining the precipitation from the vault while retaining oil, if present. The licensee further stated that appropriate action would be taken to assure that transformer oil releases to the environment would be precluded.

9. Protection of the Environment During Construction Activities

The inspector examined the areas of construction on the TMI-2 site to ascertain the provisions made to prevent adverse environmental impact during construction activities. Most of the outside construction involving earth moving had been completed. The licensee stated that weekly observations of the construction and ground drainage areas were made by the Operations Department for signs of oil or other chemical discharges and for signs of flooding or erosion. The inspector noted no signs of oil, flooding, erosion or siltation in the drainage areas.

1586 074