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

Region I

Report No. 50-320/77-44

Docket No. 50-320

License No. CPPR-66 Priority _____ Category B

Licensee: Metropolitan Edison Company

P. O. Box 542

Reading, Pennsylvania 19603

Facility Name: Three Mile Island, Nuclear Station, Unit 2

Inspection at: Middletown, Pennsylvania

Inspection conducted: November 15-18, 1977

Inspectors: William J. Tobin III
W. J. Tobin, Physical Security Inspector — Dec 16 1977 date signed

Richard H Ladun
R. Ladun, Physical Security Inspector — 12-14-77 date signed

_____ — date signed

Approved by: J W Devlin
J. W. Devlin, Chief, Security and Investigation Section, Safeguards Branch — 12/15/77 date signed

Inspection Summary:

Preoperational, Unannounced Inspection on November 15-18, 1977 (Report No. 50-320/77-44)

Areas Inspected: Security Plan (Guard Procedures), Security Organization, Physical Barriers, Access Controls, Detection Aids and Communications relative to the issuance of the Operating License. The licensee's interim measure of stationing watchmen and the use of extensive guard patrols in lieu of alarmed protected and vital area barriers. This inspection involved 22 inspector-hours onsite by two NRC inspectors.

Results: No items of noncompliance were identified.

S-F1-77-143
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B/11

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

Region I

Report No. 50-320/78-05

Docket No. 50-320

License No. CPPR-66 Priority -- Category B-1

Licensee: Metropolitan Edison Company

P. O. Box 542

Reading, Pennsylvania 19607

Facility Name: Three Mile Island Nuclear Station, Unit 2

Inspection at: Middletown, Pennsylvania

Inspection conducted: January 1-3, 1978

Inspectors: R C Ward for
J. C. Higgins, Reactor Inspector — 1/12/78 date signed

_____ date signed

_____ date signed

Approved by: D. L. Caphton
D. L. Caphton, Chief, Nuclear Support Section No. 1, RO&NS Branch — 1/12/78 date signed

Inspection Summary:

Inspection on January 1-3, 1978 (Report No. 50-320/78-05)
Areas Inspected: Routine, unannounced inspection of containment integrated leak rate test and previously identified items. The inspection involved 26 inspector hours onsite by one NRC inspector.
Results: No items of noncompliance were identified.

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(Rev. April 77)

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B/12

DETAILS

1. Persons Contacted

The below technical and supervisory level personnel were contacted.

R. Carlson, Startup and Test Engineer (UE&C)
A. Dominguey, Shift Test Engineer (GPU)
J. Garrison, Shift Test Engineer (GPU)
S. Poje, Startup Engineer (GPU)
M. Nelson, Technical Engineer (GPU)
S. Tapscott, Project Engineer (Brewer)
R. Toole, Test Superintendent (GPU)

GPU - General Public Utilities Service Corporation
UE&C - United Engineers and Constructors
Brewer - Brewer Engineering Laboratories

2. Licensee Action on Previous Inspection Findings

(Unresolved) Open Item (320/77-26-20): The licensee has not, as yet, corrected temperatures, humidities or verification test flowrates for instrument error as required by section III.A.3.(c) of Appendix J. This item is unresolved.

(Closed) Unresolved Item No. (320/77-39-01): The licensee obtained a Volumetrics leak rate monitor with which he measured flowrates for the local leak rate tests. The inspector reviewed the calibration data for this instrument and had no further questions on this item.

(Closed) Unresolved Item No. (320/77-39-02): The inspector reviewed changes made to procedure TP 151/1 subsequent to inspection 77-39 and determined that the procedure adequately covered the three concerns addressed under this item.

(Closed) Inspector Follow Item No. (320/77-39-03): Based on NRR review and acceptance the licensee's leak rate test program as presented in the FSAR, the handling of the Nuclear Service River Water (NSRW) containment isolation valves is acceptable. This item is closed.

(Closed) Unresolved Item No. (320/77-39-04): The licensee's procedure TP 150/3, as executed, satisfactorily incorporated both of the comments under this item.

3. Containment Integrated Leak Rate Test (CILRT)

a. Cnronology

The inspector witnessed the preoperational CILRT at Three Mile Island, Unit 2. A general chronology of the test follows:

12/31 0200	Commenced pressurization for CILRT.
1/1 0200	Reactor Building pressurization complete. Pressure at approximately Pa+0.1 (56.3 psig).
0800	Stabilization period complete.
1100	Initial calculations indicate leakage rate is approximately double the acceptance criteria. Licensee is conducting leak searches.
1330	Several leakage paths isolated or repaired. Commenced new 24 hour CILRT.
2330	Licensee shifting Reactor Building fan cooler line up due to possible out-leakage through cooling coils.
1/2 1330	Mass point leakage rate after 24 hours is 0.0964%/Day, 95% upper confidence level is 0.1012%/Day.
1/2 1630	Mass point leakage rate after 27 hours is 0.0906%/Day. 95% upper confidence level is 0.0952%/Day.
1730	Superimposed leak rate test commenced
1/3 0430	Superimposed leak rate test completed satisfactorily.

b. Satisfactory CILRT

The inspector independently calculated the CILRT leakage rate using data from 1330, January 1 to 1630, January 2. The values obtained indicate that the mass point leakage rate at the 95% upper confidence level is less than the acceptance criteria of 0.75 La (0.0975%/Day). Final acceptance of the test results will be contingent on the conservative additions and calibration corrections discussed below and in paragraph 2. Therefore, the satisfactory completion of the CILRT is considered unresolved pending these corrections (320/78-05-01).

c. Local Leak Rate Corrections

Artificial leakage barriers were installed on 2 penetrations during the CILRT. Local leak rate tests must be performed on these penetrations and the results added to the measured leak rate at the 95% upper confidence level in order to determine overall CILRT acceptability. The 2 penetrations are discussed below. This item is unresolved (No. 320/78-05-02).

(1) SAV-20

The containment isolation valve SAV-20 did not shut properly due to binding in the operator. Downstream isolation valves were manually closed to limit leakage.

(2) R-562C

Penetration R-562C is used for sensing Reactor Building pressure. A portion of the tubing connecting the penetration to the pressure detector had been inadvertently removed prior to the CILRT and tape installed over the penetration. The taped penetration was discovered leaking during the CILRT and was capped. A local leak rate test must be performed after the tubing is reconnected.

d. Sump Level Changes

If water inleakage from other systems causes the various Reactor Building sump levels to increase, the CILRT will be biased in a non-conservative direction. Therefore, sump level changes must be monitored during the test interval. The licensee had taken sump levels prior to the test but instrumentation for

level measurements must be made on containment entry following the test and the results evaluated to determine whether conservative corrections are required. The levels in question are the Reactor Building Sump Level, Reactor Coolant Drain Tank Level and the Reactor Vessel Level. This item is unresolved (Item No. 320/78-05-03).

e. Calibration Records

The inspector reviewed calibration records for instrumentation used during the CILRT and had no further questions except for the humidity and flowrate instrumentation. The licensee was unable to provide calibration records for the Dewcels and flowmeters which were traceable to nationally recognized standards, as required by ANSI N45.5, 10 CFR 50 Appendix B (Criterion XII), Three Mile Island Test Instruction 19 (paragraph 3.2.3.1) and the Metropolitan Edison QA Program for Operations (FSAR paragraph 17.2.17). Additionally the licensee was unable to show that the Dewcel to Dewpoint conversion sheet being used during the test was the proper one for use with the installed instrumentation. These items are unresolved (No. 320/78-05-04).

f. Verification Test

Verification test results appear to be satisfactory based on preliminary calculations without instrument calibration corrections (discussed in paragraph 2). The verification test acceptance criteria are:

-- $(Li + Lam - .25\ La) < Lvm < (Li + Lam + .25\ La)$ where:

-- Li = Superimposed leak rate = 6.71 SCFM = 0.0955%/Day

-- Lam = Measured containment leak rate during CILRT = 0.0472%/Day (using data only from 8:30 to 17:00 on January 2, 1978, the last 8.5 hours of the CILRT)

-- La = Maximum allowable leak rate = 0.13%/Day

-- Lvm = Measured leak rate during verification test = 0.1359%/Day

-- Thus; $0.1102 < 0.1359 < 0.1752$

g. Acceptable CILRT Areas

Except as noted in other sections of this report, the following areas were identified as acceptable.

(1) Witnessing of licensee data taken during the CILRT, to verify proper manning, qualifications and performance.

(2) Independent calculation of leakage rates from raw data.

(3) Check of 15 penetrations to ensure valves were actually aligned as on the valve linups and that proper venting and draining per Appendix J had been achieved.

(4) Verification that test prerequisites were met.

(5) Observation of the performance of test and control room personnel during the CILRT, including determination of proper manning with qualified personnel, proper use of procedures and maintenance of Shift Test Engineer Log.

(6) Witnessing of quality control and plant supervision participation in the test.

4. Unresolved Items

Items about which more information is required to determine acceptability are considered unresolved. Paragraphs 2, 3.b, 3.c, 3.d and 3.e of this report contain unresolved items.

5. Exit Interview

A meeting was held at the conclusion of the inspection with Mr. M. Nelson to discuss the inspection findings including the unresolved items.