IE:I Form 12
(Jan 75) (Rev)

U. S. NUCLEAR REGULATORY COMMISSION

OFFICE OF INSPECTION AND ENFORCEMENT

REGION I

IE Inspection Report No: 50-286/75-11 Docket No: 50-286

Licensee: Consolidated Edison Company of New York, Inc. License No: CPPR-62

4 Irving Place Priority:

New York, New York 10003 Category: B1

Safeguards Group:

Location: Indian Point 3, Buchanan, New York

Type of Licensee: PWR, 965 MWe (Westinghouse)

Type of Inspection: Special, Announced

Dates of Inspection: April 24-25, 1975 and May 7, 1975

Dates of Previous Inspection: April 23-25, 1975

Reporting Inspector: W A Ruhlman for 5/22/75
T. Martin, Reactor Inspector DATE

Accompanying Inspectors: D H Dickinson 5/22/75
for E. McCabe, Senior Reactor Inspector DATE

DATE

DATE

Other Accompanying Personnel: DATE

Reviewed By: D H Dickinson 5/22/75
for E. C. McCabe, Senior Reactor Inspector DATE
Nuclear Support Section, Reactor Operations Branch

SUMMARY OF FINDINGS

Enforcement Action

None

Licensee Action on Previously Identified Enforcement Items

Not inspected

Design Changes

None identified

Unusual Occurrences

None identified

Other Significant Findings

A. Current Findings

1. Instrument Error Addition to Measured Leakage Rate exceeds Acceptance Criteria. (Detail 2.c)

2. Calculated Leakage Rate Conversion to Equivalent DBA conditions questioned. (Detail 2.f)

3. Air Lock Testing requirements position stated. (Detail 4)

4. Water Leakage Testing of Isolation Valves position given. (Detail 5)

5. Test Connection Isolation Valve testing requirements unresolved. (Detail 6)

B. Status of Previously Reported Unresolved Items

1. Inspection Report 50-286/75-01, Detail 5.a, Upper 95% Confidence Limit of Measured Leakage Rate exceeds Acceptance Criteria. Resolved. (Detail 2.g)

2. Inspection Report 50-286/75-26, Detail 3.f, Penetration and Weld Channel Pressurization Isolation Valve, Type C testing requirements. Resolved. (Detail 3)

Management Interview

At the conclusion of the inspection on May 7, 1975, a management interview was conducted with the following personnel present:

Consolidated Edison Company of New York, Inc.

Mr. C. Forsberg, Engineer
Mr. R. Gordon, Director, QS&R
Mr. C. Jackson, Nuclear Licensing Engineer
Mr. W. Josiger, Test Engineer
Mr. V. Perry, Jr., Superintendent, Field Operations
Mr. H. Reizenstein, Consultant, QA&R
Mr. S. Zulla, Acting Operations Engineer

Westinghouse Electric Corporation

Mr. W. Bradford, WEDCO Operations Manager, Procedures
Mr. E. Powell, Vice President, WEDCO Engineering
Mr. K. Kussmaul, Statistician, Research

Gilbert Associates, Inc.

Mr. R. Ely, Jr., Nuclear Engineer
Mr. R. Shirk, Engineer

USNRC

Mr. T. Martin, Reactor Inspector, IE:I
Mr. E. McCabe, Senior Reactor Inspector, IE:I
Mr. R. Shewmaker, Senior Structural Engineer, IE:HQ

The following summarizes the items discussed:

1. Instrument and Monitoring System Repeatability Error Basis. (Detail 2.a)

2. ILRT Report Systematic Error Analysis. (Detail 2.b)

3. Addition of Instrument Error to Measured Leakage Rate. (Detail 2.c)

4. Corrections to Confidence Interval. (Detail 2.d)

5. ILRT Report Verification. (Detail 2.e)

6. Leakage Rate Conversion to Equivalent DBA conditions. (Detail 2.f)

7. Resolution of Reported 95% Confidence Limit. (Detail 2.g)

8. Air Lock Testing Requirements Position. (Detail 4)

9. Water Leakage Testing Position. (Detail 5)

10. Test Connection Isolation Valves Testing Requirements. (Detail 6)

DETAILS

1. Persons Contacted

Consolidated Edison Company of New York, Inc.

Mr. M. Byster, QA Engineer
Mr. H. Cairns, Supervisor, Construction Inspection
Mr. S. Cantone, Chief Operations Engineer
Mr. G. Coulbourn, Manager, Indian Point 3 Construction
Mr. C. Forsberg, Engineer
Mr. R. Gordon, Director, QS&R
Mr. C. Jackson, Nuclear Licensing Engineer
Mr. W. Josiger, Test Engineer
Mr. J. Makepeace, Director, Technical Operations
Mr. V. Perry, Jr., Superintendent, Field Operations
Mr. H. Reizenstein, Consultant, QA&R
Mr. S. Zulla, Acting Operations Engineer

Westinghouse Electric Corporation

Mr. W. Bradford, WEDCO Operations Manager, Procedures
Mr. E. Powell, Vice President, WEDCO Engineering
Mr. K. Kussmaul, Statistician, Research

Gilbert Associates, Inc.

Mr. R. Ely, Jr., Nuclear Engineer
Mr. R. Shirk, Engineer

2. Vapor Containment Integrated Leak Rate Test Report

The inspector reviewed the "Preoperational Integrated Leak Rate Test of the Reactor Containment Building" report to insure the reported information accurately reflects information documented in facility records, and to determine which items in inspection report 50-286/74-26 remained unresolved.

a. Instrument and Monitoring System Repeatability Error

The inspector asked to be shown the basis for the test instrument and monitoring system repeatability error numbers reported on pages 9 through 11 of the Integrated Leak Rate Test (ILRT) report. The inspector examined copies of the Resistance Temperature Detector calibration report, the Digital Volt Meter

and Ohms to Volts Converter Technical Manuals, and the Precision Pressure Gauge Specifications. The Temperature Indicating System Readout Devices' repeatability error, reported on page 10 of the report, duplicates the reported accuracy error figures, based on the licensee's assumption that this would be the worst case. The Pressure Monitoring System overall repeatability, reported on page 11 of the report, should read $\pm$ 0.0005% of full scale.

Based on the examination of these records and independent calculations, the inspector has no further questions on this item.

b. Systematic Error Analysis

(1) Method

The inspector questioned the validity of the Systematic Error Analysis presented on pages 12-16 of the ILRT report; since it was based on the formula presented on page 13, while the reported weight percent leakage was the mean of 24 calculations using the formula on page 29 of the report. (Assuming the individual calculations were independent events, this would increase the reported systematic error by the square root of 24.)

The licensee presented an alternate analysis based on the formulas utilized to develop the one on page 29 of the report and on the fact that the calculations were not independent events. The licensee demonstrated that the analysis presented in the report was a good approximation and that the results were valid.

The inspector has no further questions on this item.

(2) Numbers

The inspector independently computed the systematic instrument error, utilizing the licensee reported repeatability errors. Although there are minor disagreements in a number of intermediate steps, the licensee's reported error in L agrees with the inspector's computations.

The inspector has no further questions on this item.

c. Instrument Error Addition

The licensee informed the inspector that instrument error, which is reported in the ILRT report, was not combined with calculated weight percent leakage rate, to determine if the acceptance criteria is met. Furthermore, the licensee stated that to correct instrument error for the Design Basis Accident (DBA) conditions was not proper.

Appendix J to 10 CFR 50, Section III.A.3(c) states:

> "Test leakage rates shall be calculated using absolute values corrected for instrument error."

The licensee's revised report provides the following numbers:

	Reduced Pressure	Accident Pressure
Acceptance Criteria	< 0.014%/day	< 0.075%/day
Measured Leakage	+ 0.004%/day	+ 0.023%/day
DBA Corrected Leakage	+ 0.005%/day	+ 0.027%/day
Uncorrected Systematic Error	± 0.011%/day	± 0.010%/day

The inspector notes that the reduced pressure test measured leakage plus the maximum expected systematic instrument error already exceeds the acceptance criteria. Correcting the instrument error for the DBA conditions would further cause the acceptance criteria to be exceeded.

Since the licensee does not accept the addition of instrument error to the measured leakage rate, or the correction of both numbers for the DBA conditions; this item is unresolved. (Reference previous inspection report 50-286/74-26, Detail 2.k)

d. Confidence Interval Corrections

The inspector questioned the rational behind subtracting systematic instrument error from the confidence limit associated with the least squares fit of the data (see pages 34 and 36 of the ILRT report).

The licensee stated that this was not an attempt to decrease the confidence interval, but simply a means to determine the random component of this measure. The licensee stated that

a more appropriate means to determine this random component would be the square root of the differences between the squares of the confidence interval and systematic instrument error.

The inspector has no further questions on this item.

e. Report Verification

The inspector reviewed the licensee's records of raw data taken during the ILRT. The inspector selected a representative sample of the raw data, and independently performed the calculations required to obtain the calculated data presented in the ILRT report. The inspector informed the licensee that several numbers appeared to be in error.

The licensee reviewed all the raw data, confirmed the minor errors detected by the inspector, and noted several minor errors not detected in the inspector's sample. The licensee prepared a set of errata sheets to be submitted to the Commission to correct the original report.

The inspector has no further questions on this item.

f. Leakage Rate Conversion

The inspector questioned on what basis the calculated leakage rates were converted to equivalent DBA leakage rates. The licensee informed the inspector that the calculated leakage rates were increased by multiplying by the square root of the ratio of DBA peak temperature to ILRT temperature. This was based on the correction factor for flow meters used at temperatures for which they are not calibrated.

This item is unresolved.

g. 95% Confidence Limit

The inspector noted that the reported 95% Confidence Limit for the Peak Accident Pressure test was 0.054%/day in the original ILRT report. This number differs from the 0.11%/day recorded by another NRC inspector during the conduct of the ILRT. The inspector requested clarification.

The licensee informed the inspector that during the test, the mean leakage rate standard deviation had incorrectly

been called the 95% Confidence Limit and that this incorrect information had been given the inspector.

This inspector reviewed a copy of the computer printout and notes that the standard deviation was indeed recorded as 0.111%/day. An independent calculation by the inspector supports this number and the 95% Confidence Limit presented in the report.

The inspector has no further questions on this item. This resolves inspection report 50-286/75-01, Detail 5.a.

3. Penetration and Weld Channel Pressurization Isolation Valves

Inspection report 50-286/74-26, Detail 3.f, questioned why Penetration and Weld Channel Pressurization Isolation Valves did not receive type C tests. It was noted at that time that these valves could be exempted from type C testing if the licensee could demonstrate that the Weld Channels were welded to the applicable ASME code; specifically, that the Weld Channel was welded to the same code as the liner.

The inspector reviewed "Specifications for Containment Building Liner, Equipment Hatch and Personnel Locks;" "Containment Building Liner Welding Procedure Specifications;" various Field Prints, As Built Inspection Reports, and Quality Control Inspection Reports. In every case reviewed by the inspector, the Weld Channel was welded by the same procedure as the liner, by welders qualified to weld the liner.

The inspector has no further questions on this item and this resolves inspection report 50-286/74-26, Detail 3.f.

4. Air Lock Testing

Inspection Report 50-286/74-26, Detail 3.h, questions why plans do not exist for conducting full pressure entire air lock tests at 6 month intervals per 10 CFR 50, Appendix J, Section III.D.2.

The licensee's position is as follows.

"The Unit 3 personnel lock is constructed so that potential leakage from containment atmosphere would have to pass through two separate series barriers. The space between the two barriers is continuously pressurized in accordance with Unit 3 technical specification by the containment penetration and weld channel pressurization system (WCCP)

to a pressure greater than the maximum containment DBA pressure. The WCCP system contains flow/pressure instrumentation that continuously monitors leakage through potential DBA containment leakage paths.

The air lock is constructed so that WCCP will pressurize and monitor the following areas:

a. Containment restraining welds and bolted joints.
b. Exterior barrel weld sears.
c. Shaft seal and gasket joints.
d. Equalizing valve and gasket joints.
e. Door gaskets.
f. Door welded joints.
g. Various lock welded joints.
h. Gauge piping.
i. Electrical penetrations.

It is, therefore, concluded that the leakage monitoring capabilities of the WCCP system adequately fulfills the personnel air lock testing requirements of Appendix J to 10 CFR 50."

This item is unresolved.

5. Water Leakage Testing

Revision No. 10 to Technical Specification 4.4, submitted to the Commission on January 13, 1975 as part of Supplement No. 28 to the FSAR, lists the containment isolation valves requiring leak rate testing and the test medium to be used. It is the licensee's position that only those valves subject to gas pressurization testing should be applicable to the 0.60 La acceptance criterion for Type C tests. The licensee believes that those isolation valves which see water during accident conditions should appropriately be tested with water at a pressure of 1.10 Pa. Being in contact with water during accident conditions effectively seals these valves and prevents out-leakage of containment atmosphere. In accordance with this position, the licensee has not proposed a method of converting water-leakage to equivalent air-leakage.

This item is unresolved. (Reference inspection report 50-286/74-26, Detail 3.b)

6. Test Connection Isolation Valves

The inspector identified various test connection valves that constituted containment isolation valves, and would require Type C

testing if not otherwise excluded. At the inspector's request, the licensee provided the inspector with one line drawings showing these valves and indicating their size. In each case, the valves were one inch or less in size, backed up by a threaded cap, located between containment isolation valves, and provide a path for bypassing one of the containment isolation valves.

The licensee does not plan to test these valves and this item is unresolved. (Reference inspection report 50-286/74-26, Detail 3.e)