# CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9704030085 DOC.DATE: 97/03/27 NOTARIZED: NO DOCKET #
FACIL:50-387 Susquehanna Steam Electric Station, Unit 1, Pennsylva 05000387
AUTH.NAME AUTHOR AFFILIATION
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KUCZYNSKI,G.J. Pennsylvania Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 97-005-01:on 970204,closed sys integrity were not verified by testing.Cause has not been determined.Testing of closed sys for all penetrations has been completed in both units.W/970327 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 5
TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

NOTES: 05000387

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March 27, 1997

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
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SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 50-387/97-005-01
PLAS - 703 FILE R41-2

Docket No. 50-387
License No. NPF-14

Attached is Licensee Event Report 50-387/97-005-01. The original event was determined to be reportable per 10CFR50.73(a)(2)(i)(B) in that the redundant containment isolation barrier (closed system) for the Residual Heat Removal (RHR) full flow test and the RHR suppression pool spray penetrations were not tested in accordance with Technical Specification requirements. Subsequent to the original report, two additional penetrations in the RHR System were found not to have the redundant containment isolation barrier (closed system) tested in accordance with Technical Specification requirements. These are conditions prohibited by the Technical Specifications.

G. J. Kuczynski
Plant Manager - Susquehanna SES

Attachment

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NRC FORM 366 (6-89) U.S. NUCLEAR REGULATORY COMMISSION

# LICENSEE EVENT REPORT (LER)

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92
ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U7.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

| FACILITY NAME (1) | DOCKET NUMBER(2) | PAGE (3) |
|---|---|---|
| Susquehanna Steam Electric Station - Unit 1 | 0 5 0 0 0 3 8 7 | 1 OF 0 4 |

TITLE (4)
Closed System Integrity Not Verified By Testing

| EVENT DATE (5) | | | LER NUMBER (6) | | | REPORT DATE (7) | | | OTHER FACILITIES INVOLVED (8) | |
|---|---|---|---|---|---|---|---|---|---|---|
| MONTH | DAY | YEAR | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | MONTH | DAY | YEAR | FACILITY NAMES | DOCKET NUMBER(S) |
| 0 2 | 0 4 | 9 7 | 9 7 | — 0 0 5 | — 0 1. | 0 3 | 2 7 | 9 7 | SSES Unit 2 | 0 5 0 0 0 3 8 8 |
| | | | | | | | | | | 0 5 0 0 0 |

| OPERATING MODE (9) | 1 |
|---|---|
| POWER LEVEL (10) | 1 0 0 |

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

| | | | | | |
|---|---|---|---|---|---|
| | 20.402(b) | | 20.405(c) | | 50.73(a)(2)(iv) | | 73.71(b) |
| | 20.405(a)(1)(i) | | 50.36(c)(1) | | 50.73(a)(2)(v) | | 73.71(c) |
| | 20.405(a)(1)(ii) | | 50.36(c)(2) | | 50.73(a)(2)(vii) | | OTHER (Specify in Abstract below and in Text, NRC Form 366A) |
| | 20.405(a)(1)(iii) | X | 50.73(a)(2)(i) | | 50.73(a)(2)(viii)(A) | | |
| | 20.405(a)(1)(iv) | | 50.73(a)(2)(ii) | | 50.73(a)(2)(viii)(B) | | |
| | 20.405(a)(1)(v) | | 50.73(a)(2)(iii) | | 50.73(a)(2)(x) | | |

(LICENSEE CONTACT FOR THIS LER (12)

| NAME | TELEPHONE NUMBER |
|---|---|
| Cornelius T. Coddington - Senior Project Engineer, Licensing | AREA CODE 7 1 7 5 4 2 - 3 2 9 4 |

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

| CAUSE | SYSTEM | COMPONENT | MANUFAC-TURER | REPORTABLE TO NPRDS | | CAUSE | SYSTEM | COMPONENT | MANUFAC-TURER | REPORTABLE TO NPRDS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| SUPPLEMENTAL REPORT EXPECTED (14) | | EXPECTED SUBMISSION DATE (15) | MONTH | DAY | YEAR |
|---|---|---|---|---|---|
| | YES (If yes, complete EXPECTED SUBMISSION DATE) | X NO | | | |

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On February 4, 1997, with Unit 1 and Unit 2 in Condition 1 (Power Operation) at 100% power, the redundant containment isolation barrier (closed system) for the Residual Heat Removal (RHR) System full flow test and the RHR suppression pool spray penetrations were found not tested per Technical Specification requirements. This is a condition prohibited by Technical Specifications and is reportable per 10CFR50.73(a)(2)(i)(B). In addition, on February 26, 1997, two additional penetrations on the RHR System were found not tested per Technical Specifications. A conclusive cause could not be determined. The most likely cause was human error associated with the original design engineers not ensuring that design requirements were adequately incorporated into testing requirements. Several causal factors related to human performance were identified. Corrective actions include: testing of the closed systems, performance of leakage quantification testing, revision to surveillance procedures, revision to the leak rate test program and training on closed system design and testing requirements. There were no safety consequences or compromises to public health and safety by not having the redundant barrier tested since isolation of the penetrations was provided by closed valves which were tested in accordance with Technical Specification requirements.

## EVENT DESCRIPTION

On February 4, 1997, with Unit 1 and Unit 2 in Condition 1 (Power Operation) at 100% power, the redundant containment (EIIS Code: NH) isolation barrier (closed system) for the Residual Heat removal (RHR) System (EIIS Code: BO) full flow test and the RHR suppression pool spray penetrations were found not tested per Technical Specification Table 3.6.3-1, Note (c). Technical Specification Table 3.6.3-1, Note (c) states that for penetrations with single isolation valve and the redundant isolation barrier being a closed system, the closed system integrity is verified by Type A test. This condition was discovered during an engineering review of the Containment Boundary Closed System Requirements Study. Engineering personnel (utility, non-licensed) could not confirm that the integrity of the closed systems for these penetrations was tested by a Type A test or another equivalent test. Therefore, the integrity of the closed system was indeterminate.

On February 26, 1997, with Unit 1 in Condition 4 (Cold Shutdown) at 0% power and with Unit 2 in Condition 1 (Power Operation) at 92% power, the redundant containment (EIIS Code: NH) isolation barrier (closed system) for the RHR Heat Exchanger Vent and Post Accident Sampling System (PASS) liquid return line penetrations were found not tested per Technical Specification Table 3.6.3-1, Note (c) also. In addition, the pressure boundary for the portion of the PASS liquid return lines had not been verified by system integrity testing per Technical Specification 6.8.4a. This condition was discovered during the continuation of the engineering review of the Containment Boundary Closed System Requirements Study. As with the RHR full flow test and RHR suppression pool spray penetrations, the integrity of the RHR Heat Exchanger and PASS liquid return line penetrations was indeterminate.

## CAUSE OF EVENT

A definitive root cause for these events could not be determined. The most likely cause was human error associated with the original design engineers ensuring that design requirements were adequately incorporated into testing requirements. Several causal factors, all related to human performance, were identified as contributing to these events. These causal factors are: 1) a lack of understanding of closed systems by the utility and architect engineer design and test engineers; 2) lack of understanding regarding Technical Specification Table 3.6.3-1, note (c), and the lack of Limiting Condition for Operation (LCO) actions for closed systems and note (c); and 3) failure during the preparation and review of the Containment Boundary Closed System Requirements study to identify that the closed systems for these penetrations had not been tested.

## REPORTABILITY/ANALYSIS

The event dated February 4, 1997, was determined to be reportable per 10CFR50.73(a)(2)(i)(B), in that the redundant containment isolation barrier (closed system) for the Residual Heat Removal (RHR) full flow test and the RHR suppression pool spray penetrations were not tested in accordance with Technical Specification Table 3.6.3-1, Note (c). This was a condition prohibited by Technical Specifications.

The lines of concern in these penetrations are associated with the former Steam Condensing Mode of RHR and isolated by a valve and a closed system. The isolation valves have been local leak rate tested (LLRT) as part of the Technical Specification limit of $0.6L_a$ for LLRT barriers. The isolation valves are normally locked closed and de-activated with no safety function to open. The integrity of the closed system had not been confirmed by testing. However, the units were within the allowed containment limits as specified in Technical Specifications because of the position of the isolation valves. There were no safety consequences or compromises to public health and safety by not having the redundant barrier tested since isolation of the penetrations was provided by locked closed, deactivated valves which were tested in accordance with Technical Specification requirements.

During the continued review of the Containment Boundary Closed System Requirements Study, two additional penetrations in each unit were determined to be reportable per 10CFR50.73(a)(2)(i)(B) in that their redundant containment isolation barrier (closed systems) were not tested in accordance with Technical Specification Table 3.6.3-1, Note (c). Also, the PASS liquid return line was not tested in accordance with Technical Specification 6.8.4a. The lines of concern are the RHR Heat Exchanger Vent and PASS Liquid Return lines and are isolated by a valve and a closed system. The isolation valves have been local leak rate tested as part of the Technical Specification limit of $0.6L_a$ for LLRT barriers. These valves are normally closed and do not have a safety function to open. The valves are opened for brief periods of time to support PASS operation and depressurization of the RHR System when necessary. Even if the valves would fail open, the leak paths in the untested portion of piping is limited to valve packing and a one inch manual valve with a pipe cap. Such leak paths would be expected to yield small amounts of leakage such that exceeding Technical Specification limits would not be expected. Therefore, there were no safety consequences or compromises to public health and safety by not having the redundant barrier tested.

In accordance with the guidelines provided in NUREG-1022, Supplement 1, Item 14.1, the required submission date for the original report was determined to be March 6, 1997.

## CORRECTIVE ACTIONS

The following corrective actions have been identified and completed:

- Testing of the closed systems for all the penetrations has been completed in both units.
- The surveillance procedures have been revised to include testing of the closed systems associated with these penetrations.
- A review confirmed that all other closed system boundaries have been tested to verify integrity.
- Leakage quantification testing of the PASS liquid return line has been completed for Unit 1.

The following corrective actions have been identified and are to be completed:

- Leakage quantification testing of the PASS liquid return line will be performed for Unit 2.
- Training of appropriate engineering personnel to ensure that closed system design and testing requirements are clearly delineated will be performed.
- The leak rate test program will be revised to include testing requirements for closed systems.

## ADDITIONAL INFORMATION

Past Similar Events: None

Failed Component: None