

LICENSEE EVENT REPORT (LER)

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.

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

TITLE (4)
Recirculation Discharge Valve Bonnet Vent Line Crack

| 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 9 | 1 8 | 9 7 | 9 7 | 0 0 6 | 0 0 | 1 0 | 2 0 | 9 7 | | | 0 5 0 0 0 |
| (LICENSEE CONTACT FOR THIS LER (12)) | | | | | | | | | | | |

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| OPERATING MODE (9) 4 | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 1 : (Check one or more of the following) (11) | | | | | | | | | |
| POWER LEVEL (10) 0 0 0 | <input type="checkbox"/> 20.402(b) | <input type="checkbox"/> 20.405(c) | <input type="checkbox"/> 50.73(a)(2)(v) | <input type="checkbox"/> 73.71(b) | | | | | | |
| | <input type="checkbox"/> 20.405(a)(1)(i) | <input type="checkbox"/> 50.35(c)(1) | <input type="checkbox"/> 50.73(a)(2)(x) | <input type="checkbox"/> 73.71(c) | | | | | | |
| | <input type="checkbox"/> 20.405(a)(1)(ii) | <input type="checkbox"/> 50.35(c)(2) | <input type="checkbox"/> 50.73(a)(2)(w) | OTHER (Specify in Abstract below and in Text, NRC Form 368A) | | | | | | |
| | <input type="checkbox"/> 20.405(a)(1)(iii) | <input type="checkbox"/> 50.73(a)(2)(y) | <input type="checkbox"/> 50.73(a)(2)(x)(A) | | | | | | | |
| | <input type="checkbox"/> 20.405(a)(1)(iv) | <input checked="" type="checkbox"/> 50.73(a)(2)(z) | <input type="checkbox"/> 50.73(1)(2)(z)(B) | | | | | | | |
| <input type="checkbox"/> 20.405(a)(1)(v) | <input type="checkbox"/> 50.73(a)(2)(a) | <input type="checkbox"/> 50.73(a)(2)(x) | | | | | | | | |

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

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

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPRDS | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPRDS |
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| SUPPLEMENTAL REPORT EXPECTED (14) <input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO | EXPECTED SUBMISSION DATE (15) MONTH: DAY: YEAR: |
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On September 18, 1997 at 2120 hours with Unit 2 in Condition 4 (Cold Shutdown) at 0% power, it was discovered that a 180° through wall crack in a weld existed on the 'B' Reactor Recirculation Discharge Valve bonnet 3/4" vent line, immediately upstream of the inboard vent valve. The unit had been conservatively shut down on September 17, 1997 due to an increase in unidentified drywell leakage prior to any Technical Specification limit being exceeded. The crack was discovered during an investigation into the source of the unidentified drywell leakage. This event is reportable pursuant to 10CFR50.73 (a)(2)(ii) in that Unit 2 was in a degraded condition. The cracking of the weld resulted from vibration-induced fatigue during operation that resulted from the piping being in a cantilevered configuration. The 'B' Reactor Recirculation Discharge Valve bonnet vent line in the vicinity of the weld was replaced during the Unit 2 eighth Refueling Outage in the Spring of 1997. The cantilever condition was not detected because of confusion over, and misinterpretation of, the requirements to perform hanger inspections in the design specification. Corrective actions that were completed include cutting and capping the affected vent line; inspection of similar configurations in Unit 2; and review of other similar work plans that were completed in the Unit 1 8RIO and Unit 2 7RIO. Proposed corrective actions include revising of the design specification; reviewing work packages not already implemented to insure the proper requirements for hanger inspection are incorporated; inspecting similar configurations in Unit 1; and training on the revision to the design specification. There were no safety consequences or compromises to public health and safety as a result of this event since even if a complete failure of the weld had occurred, the resulting small pipe break is bounded by an analyzed condition. The inventory loss from the break would be made-up by either the Reactor Core Isolation Coolant System (RCIC) or the High Pressure Injection System (HPCI). Both of these systems were operable at the time of the event.

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| FACILITY NAME (1) Unit 2 Susquehanna Steam Electric Station | DOCKET NUMBER (2) 0 5 0 0 0 3 8 8 | LER NUMBER (6) | PAGE (3) | | | | | | | | | | | | | |
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| | | <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:10%;">YEAR</th> <th style="width:10%;"></th> <th style="width:10%;">SEQUENTIAL NUMBER</th> <th style="width:10%;"></th> <th style="width:10%;">REVISION NUMBER</th> </tr> <tr> <td style="text-align: center;">9 7</td> <td style="text-align: center;">—</td> <td style="text-align: center;">0 0 6</td> <td style="text-align: center;">—</td> <td style="text-align: center;">0 0</td> </tr> </table> | YEAR | | SEQUENTIAL NUMBER | | REVISION NUMBER | 9 7 | — | 0 0 6 | — | 0 0 | <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:10%; text-align: center;">2</td> <td style="width:10%; text-align: center;">OF</td> <td style="width:10%; text-align: center;">4</td> </tr> </table> | 2 | OF | 4 |
| YEAR | | SEQUENTIAL NUMBER | | REVISION NUMBER | | | | | | | | | | | | |
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| 2 | OF | 4 | | | | | | | | | | | | | | |

TEXT (If more space is required, use additional NRC Form 366A's) (17)

EVENT DESCRIPTION

On September 18, 1997 at 2120 hours with Unit 2 in Condition 4 (Cold Shutdown) at 0% power, it was discovered that a 180° through wall crack in a weld was located on the 'B' Reactor Recirculation Discharge Valve bonnet 3/4" vent line (EIS CODE: AD), immediately upstream of the inboard vent valve. A decision had been made to shut down the unit due to an increase in unidentified drywell leakage. The shutdown had been completed on September 17, 1997. The crack was discovered during an investigation into the source of the unidentified drywell leakage. This event is reportable pursuant to 10CFR50.73 (a)(2)(ii) in that Unit 2 was in a degraded condition.

CAUSE OF EVENT

The cracking of the weld resulted from vibration-induced fatigue during operation that resulted from the piping being in a cantilevered configuration supported at one end instead of a simple beam configuration supported at both ends as required by design. The 'B' Reactor Recirculation Discharge Valve bonnet vent line in the vicinity of the weld was replaced during the Unit 2 eighth Refueling Outage in the Spring of 1997 and was considered a maintenance activity. The cantilever condition was not detected because post-work inspections were not specified in the work plans. The condition was provoked by a severely worn hanger clip. The lack of specific inspection requirements was due to confusion over, and misinterpretation of, the requirements for inspection in the design specification.

REPORTABILITY/ANALYSIS

This event was determined to be reportable per 10CFR50.73(a)(2)(ii), in that Susquehanna SES Unit 2 was in a degraded condition as a result of 180° through wall crack in a weld existing on the 'B' Reactor Recirculation Discharge Valve bonnet 3/4" vent line. The crack was found during an investigation of increased drywell leakage following a plant shutdown. The crack produced a leakage of approximately 2 gallons per minute (gpm) at 100% power.

There were no safety consequences or compromises to public health and safety as a result of this event since, even if a complete failure of the weld had occurred, the resulting small pipe break is bounded by an analyzed condition. The inventory loss from the break would be made-up by either the Reactor Core Isolation Coolant System (RCIC) or the High Pressure Injection System (HPCI). Both of these systems were operable at the time of the event.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

In accordance with the guidelines provided in NUREG-1022, Supplement 1, Item 14.1 and 10CFR50.4, the required submission date for this report was determined to be October 20, 1997.

CORRECTIVE ACTIONS

The following corrective actions were completed:

- The 'B' Reactor Recirculation Discharge Valve bonnet vent line was cut and capped.
- The worn hanger clip was removed from service.
- The same welds on the three other similar bonnet vent valve connections on the A-Loop and B-Loop Reactor Recirculation Pump suction and discharge valves were liquid-penetrant inspected and passed inspection.
- The weld on the 'B' Reactor Recirculation Discharge Valve bonnet connecting the vent line to the bonnet was liquid-penetrant inspected and passed the inspection.
- All of the hanger clips on the bonnet vent valve lines for the suction valve of Loop B and the suction and discharge valves on Loop A, plus the hanger clips on the drain connections on the suction valve on Loop A (there is no similar valve assembly on the suction valve drain on Loop B) and the discharge valves on Loops A and B were visually inspected to confirm proper seating and the absence of severe wear. This inspection revealed no similar conditions on any inspected hanger clip in Unit 2.
- A review of other similar work performed since the Unit 1 8th Refueling Outage and the Unit 2 7th Refueling Outage was completed and indicated that no similar problems are expected to exist in either unit.

The following corrective items are to be completed:

- Issue a Specification Change Notice (SCN) to the design specification to eliminate discrepancies to ensure proper application of its requirements.
- Provide training to applicable personnel on the SCN to ensure common, correct understanding of the specification.



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- Review work packages that are currently planned but not yet implemented to verify hanger inspections are in the work plans where required by the SCN.
- Review this event with Maintenance personnel to emphasize the importance of verifying proper installation of small bore pipe and hangers.
- Revise the design specification on inspection of pipe and pipe support work to reflect applicable technical and human performance requirements so that the requirements are clearly understood and consistently applied in the future.
- Train appropriate personnel to ensure understanding of the requirements of the revised design specification.
- Inspect Unit 1 small piping configurations in containment for proper hanger clearances and hanger clip wear and correct any identified deficiencies.
- Inspect the remaining (less susceptible as defined in the long term vibration mitigation project scope) Unit 2 small pipe configurations in containment for proper hanger clearances and hanger clip wear.

ADDITIONAL INFORMATION

Past Similar Events: Docket No. 50-388, LER 93-009

Failed Component: SP-DCA-251-2, 3/4 inch pipe

