

**LICENSEE EVENT REPORT (LER)**

(See reverse for required number of digits/characters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST 500 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (IT-3 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

|                                                             |  |                               |                    |
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TITLE (4)  
Verification of ECCS Piping Full of Water Per Technical Specification 4.5.2.b.1 Not Being Met

| 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 NAME                 | DOCKET NUMBER                                 |
| 01                 | 12  | 98   | 98                                                                                          | -- 002 --         | 00              | 02                | 07                                  | 98               | FACILITY NAME                 | DOCKET NUMBER                                 |
| OPERATING MODE (9) |     | 5    | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11) |                   |                 |                   |                                     |                  |                               |                                               |
| POWER LEVEL (10)   |     | 000  | 20.2201(b)                                                                                  |                   |                 | 20.2203(a)(2)(v)  | <input checked="" type="checkbox"/> | 50.73(a)(2)(ii)  |                               | 50.73(a)(2)(viii)                             |
|                    |     |      | 20.2203(a)(1)                                                                               |                   |                 | 20.2203(a)(3)(i)  |                                     | 50.73(a)(2)(iii) |                               | 50.73(a)(2)(x)                                |
|                    |     |      | 20.2203(a)(2)(ii)                                                                           |                   |                 | 20.2203(a)(3)(ii) |                                     | 50.73(a)(2)(iii) |                               | 73.71                                         |
|                    |     |      | 20.2203(a)(2)(iii)                                                                          |                   |                 | 20.2203(a)(4)     |                                     | 50.73(a)(2)(iv)  |                               | OTHER                                         |
|                    |     |      | 20.2203(a)(2)(iii)                                                                          |                   |                 | 50.36(c)(1)       |                                     | 50.73(a)(2)(v)   |                               | Specify in Abstract below or in NRC Form 366A |
|                    |     |      | 20.2203(a)(2)(iv)                                                                           |                   |                 | 50.36(c)(2)       |                                     | 50.73(a)(2)(vii) |                               |                                               |

LICENSEE CONTACT FOR THIS LER (12)

|                                                               |                                                       |
|---------------------------------------------------------------|-------------------------------------------------------|
| NAME<br>David A. Smith, Manager, Unit 3 Regulatory Compliance | TELEPHONE NUMBER (include Area Code)<br>(860)437-5840 |
|---------------------------------------------------------------|-------------------------------------------------------|

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 |
|-------|--------|-----------|--------------|---------------------|-------|--------|-----------|--------------|---------------------|
|       |        |           |              |                     |       |        |           |              |                     |
|       |        |           |              |                     |       |        |           |              |                     |
|       |        |           |              |                     |       |        |           |              |                     |

SUPPLEMENTAL REPORT EXPECTED (14)

|                                                     |                                        |                               |       |     |      |
|-----------------------------------------------------|----------------------------------------|-------------------------------|-------|-----|------|
| YES<br>(If yes, complete EXPECTED SUBMISSION DATE). | <input checked="" type="checkbox"/> NO | EXPECTED SUBMISSION DATE (15) | MONTH | DAY | YEAR |
|-----------------------------------------------------|----------------------------------------|-------------------------------|-------|-----|------|

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On January 12, 1998, with the unit in Mode 5, it was determined from results of a system functional review sponsored by the Nuclear Safety Advisory Board (Ref.: EA 97-562 "Notice of Violation and Independent Corrective Action Verification Program Functional Inspection of Millstone Unit 3 [NRC Inspection Report No. 50-423/97-206]" dated December 5, 1997), that a segment of the Emergency Core Cooling System (ECCS) pump suction piping is not periodically verified "full of water". In Modes 1-3, Technical Specifications (TS) require that the ECCS be verified filled at least once every 31 days. The TS is met by venting ECCS pump casings and the accessible discharge piping high points.

Three segments of ECCS pump suction crossover piping were identified as being neither included in, nor specifically excluded from, the verification process. One of these segments, the cross-tie section between the Safety Injection and Charging pumps is a system high point. In the past, the Unit has operated in modes 1 through 3 without periodically verifying that this segment of piping was full of water. Consequently, this condition is being reported pursuant to 10 CFR 50.73(a)(2)(i)(B), as any operation or condition prohibited by the plant's TS. This condition is historical. The cause of this condition was that plant personnel have historically not considered the ECCS cross-tie piping as "discharge" piping due to wording ambiguities within Technical Specification 4.5.2 b 1 and the associated BASES section. As a result, surveillance procedures were prepared which did not completely verify that applicable high points of the Emergency Core Cooling System piping were filled. There was minimal safety significance because, after normal filling of the system, ultrasonic testing did not reveal the presence of air or gas pockets in the high point piping segment. Corrective actions include revising and performing the ECCS venting procedure to assure that the system is filled. Additionally, a TS BASES change will be prepared and implemented to clarify the ECCS venting process information.

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

I. Description of Event

On January 12, 1998, with the unit in Mode 5, it was determined from results of a system functional review sponsored by the Nuclear Safety Advisory Board (Ref.: EA 97-562 "Notice of Violation and Independent Corrective Action Verification Program Functional Inspection of Millstone Unit 3 [NRC Inspection Report No. 50-423/97-206]" dated December 5, 1997), that a segment of the Emergency Core Cooling System (ECCS) pump suction piping is not periodically verified full of water. Verification that the ECCS piping, from the (injection/recirculating) pumps to the Reactor Coolant System, is full of water provides assurance that the ECCS will perform its accident mitigation function during and after a Design Basis Accident (DBA). In Modes 1 through 3, Technical Specifications (TS) Surveillance Requirement (SR) 4.5.2.b.1 requires that "Each ECCS subsystem shall be demonstrated OPERABLE: ... b. At least once per 31 days by: 1) Verifying that the ECCS piping, except for the operating centrifugal charging pumps(s) and associated piping, the RSS pump, the RSS heat exchanger and associated piping, is full of water, and..." The TS BASES describes that "...The Surveillance Requirement is met by venting ECCS pump casings and the accessible discharge piping high points..."

The investigation into this issue, which included detailed discussions with system/design engineers and operations personnel, as well as a review of the applicable surveillance procedures and isometric drawings, identified three segments of ECCS pump suction crossover piping that were neither included in, nor specifically excluded from, the verification process. See Figure 1 for a simplified sketch of the segment configurations. The three piping segments identified were: upstream of valves MV8807A&B and downstream of valve V982 (suction cross-tie between the Safety Injection [SI] and Charging [CHS] pumps), between valve V982 and valve MV8804A (common CHS suction from pump RSS\*E1A), and between valve V983 and valve MV8804B (common SI suction from pump RSS\*E1B). Of these segments, the cross-tie section (Segment 1) between the SI and CHG pumps (between valve MV8807 A/B and valve V982) is a system high point while segments 2 and 3 are not high points in the system, i.e., not locations where gases would be expected to collect.

Historically, the Unit has operated in modes 1 through 3 without periodically verifying that this cross-tie segment (segment 1) was full of water. This resulted in the surveillance requirement not being met. This condition is being reported pursuant to 10 CFR 50.73(a)(2)(i)(B), as any operation or condition prohibited by the plant's Technical Specifications. This condition was dispositioned in accordance with the Millstone Corrective Action Program.

II. Cause of Event

This condition is historical. The cause of this condition was that plant personnel have historically not considered the ECCS cross-tie piping as "discharge" piping due to wording ambiguities within Technical Specification 4.5.2.b.1 and the associated BASES section. As a result, surveillance procedures were prepared which did not completely verify that applicable high points of the Emergency Core Cooling System piping were filled.

Currently, the ability to vent the piping section between the 'B' SI pump and valves MV8807A&B (segment 1) is through the pump casing and this activity is performed within a venting procedure, however, the MV8807 valves are not opened. Thus, the segment between valves MV8807A&B and the check valve is not specifically vented and it can not be demonstrated that this piping segment is free of air. Opening the MV8807 valves to vent through the pump casing requires management of an abnormal valve lineup which eliminates the separation between RHR and SI systems. This scenario was not considered during the development of the venting procedure.

Segments 2 and 3 are at a mid-point in the system. There are no vent points within these piping segments. These segments link the RSS pump discharge to the SI or charging pumps following switchover to recirculation mode.

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However, these piping segments were not considered during the initial procedure development due to their physical location (at mid-point) and physical lack of venting capability. Check valves were added to these piping segments during development of the original Westinghouse design in 1972. No provisions for venting these piping segments were included at that time.

III. Analysis of Event

The operability of the ECCS ensures that a sufficient supply of borated cooling water is available for core injection (and subsequent recirculation) in the event of a loss of coolant accident. A failure to periodically verify that applicable portions of the ECCS system are maintained full of water could result in portions of the ECCS piping containing voids and/or entrained gas pockets which could adversely affect the ability of the ECCS to function properly. Maintaining the piping full of water reduces the potential for water hammer, pump cavitation, and pumping of noncondensable gas (e.g., air, nitrogen, or hydrogen) into the reactor vessel following an SI or during shutdown cooling. The 31-day verification frequency takes into account the gradual nature of gas accumulation in the ECCS piping and the procedural controls governing system operation.

On January 9, 1998, after performance of normal filling of the system, ultrasonic testing (UT) of these piping segments was performed as part of an evaluation into other related RSS activities. Results of UT examinations did not reveal the presence of air or gas pockets in piping segment 1, although a small amount of trapped air was found at a low point in piping segment 3 (between valves MV8804B and V983). It was subsequently determined that the amount of air found was insignificant and would not adversely impact the ECCS system from performing its accident mitigating function. Therefore, there was minimal safety significance from this condition.

IV. Corrective Action

There was no immediate impact on equipment operability and immediate corrective actions required since the unit is presently in Mode 5 and operability of safety injection/recirculation subsystems are not required in this mode.

The following corrective actions will be completed:

1. Prior to entry into Mode 3, the ECCS venting surveillance procedure will be revised to include the applicable portions of the Emergency Core Cooling System piping.
2. Prior to entry into Mode 3, the revised surveillance procedure will be performed to assure that the ECCS piping is verified "full of water."
3. By May 15, 1998, a Technical Specifications BASES section change will be prepared and implemented to clarify Emergency Core Cooling System venting process information.

V. Additional Information

None

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|                                                                 |                                   |                |                   |                 |                        |
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Similar Events

Listed below are several other 1996-97 conditions involving missed or lack of verbatim compliance with Technical Specification surveillances requirements. The majority of these conditions were identified as a result of the MP3 Configuration Management review process:

- LER 96-004-00 Auxiliary Feedwater Isolation Valves Noncompliance with Technical Specifications
- LER 96-014-00 Technical Specification Surveillances for Emergency Diesel Generators, Misinterpretation and Programmatic Weakness
- LER 97-001-00 Lack of Verbatim Compliance with Technical Specification Surveillance Requirements for 125 Volt Batteries and Battery Chargers
- LER 97-004-00 Lack of Verbatim Compliance with Technical Specification Surveillance Requirements for Molded Case Circuit Breakers
- LER 97-040-00 Missed Surveillance on Technical Specification 4.0.5 for 3SWP\*V705 through V708
- LER 97-044-00 Missed TS Surveillance: ESFAS Purge Isolation Instrumentation
- LER 97-045-00 Reactor Trip System Response Time Testing Not In Verbatim Compliance with Technical Specifications
- LER 97-052-00 Deficiencies Identified in Performance of Surveillances for PORV Instrumentation
- LER 97-053-00 Channel Check Surveillance Requirements Not in Compliance with Technical Specifications

Manufacturer Data

Emergency System Code

- Reactor Coolant System.....AB
- Containment Spray System.....BE
- Engineered Safety Features Actuation System.....JE

EIS Component Code

- Pump.....P
- Tank.....TK

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Figure 1

Piping Layout and Location of Segments

