

Dominion Nuclear Connecticut, Inc.
Millstone Power Station
Rope Ferry Road, Waterford, CT 06385



Dominion®

MAY 23 2007

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

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| MPS Lic/GJC | R0 |
| Docket No. | 50-423 |
| License No. | NPF-49 |

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3
LICENSEE EVENT REPORT 2007-001-00,
FAILURE OF TWO MAIN STEAM SAFETY VALVES
TO LIFT WITHIN THE ACCEPTANCE CRITERIA

This letter forwards Licensee Event Report (LER) 2007-001-00 documenting a condition discovered at Millstone Power Station Unit 3, on April 05, 2007. This LER is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B), as a condition prohibited by the Technical Specifications.

If you have any questions or require additional information, please contact Mr. David W. Dodson at (860) 447-1791, extension 2346.

Very truly yours,


J. Alan Price
Site Vice President - Millstone

IE22

Attachments: 1

Commitments made in this letter: None.

cc: U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406-1415

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Mr. S. M. Schneider
NRC Senior Resident Inspector
Millstone Power Station

Attachment 1

LICENSEE EVENT REPORT 2007-001-00,
FAILURE OF TWO MAIN STEAM SAFETY VALVES
TO LIFT WITHIN THE ACCEPTANCE CRITERIA

Millstone Power Station Unit 3
Dominion Nuclear Connecticut, Inc. (DNC)

| | | | | | | | |
|--|--------|---|-------------------|--|--|----------------------|-----------|
| NRC FORM 366 (6-2004) | | U.S. NUCLEAR REGULATORY COMMISSION | | APPROVED BY OMB NO. 3150-0104 | | EXPIRES 06/30/2007 | |
| LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block) | | | | | | | |
| 1. FACILITY NAME Millstone Power Station - Unit 3 | | | | 2. DOCKET NUMBER 05000423 | | 3. PAGE 1 OF 4 | |
| 4. TITLE Failure of Two Main Steam Safety Valves to Lift Within the Acceptance Criteria | | | | | | | |
| 5. EVENT DATE | | | 6. LER NUMBER | | | 7. REPORT DATE | |
| MO | DAY | YEAR | YEAR | SEQUENTIAL NUMBER | REV NO. | MO | DAY |
| 04 | 05 | 2007 | 2007 - 001 - 00 | | | 05 | 23 |
| | | | | | | | |
| 8. OTHER FACILITIES INVOLVED | | | | | | | |
| FACILITY NAME | | | DOCKET NUMBER | | | | |
| | | | 05000 | | | | |
| FACILITY NAME | | | DOCKET NUMBER | | | | |
| | | | 05000 | | | | |
| 9. OPERATING MODE | | 11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) | | | | | |
| 1 | | 20.2201(b) | | 20.2203(a)(3)(ii) | | 50.73(a)(2)(ii)(B) | |
| | | 20.2201(d) | | 20.2203(a)(4) | | 50.73(a)(2)(iii) | |
| 10. POWER LEVEL | | 20.2203(a)(1) | | 50.36(c)(1)(i)(A) | | 50.73(a)(2)(iv)(A) | |
| 100 | | | | | | 73.71(a)(4) | |
| | | 20.2203(a)(2)(i) | | 50.36(c)(1)(ii)(A) | | 50.73(a)(2)(v)(A) | |
| | | 20.2203(a)(2)(ii) | | 50.36(c)(2) | | 50.73(a)(2)(v)(B) | |
| | | 20.2203(a)(2)(iii) | | 50.46(a)(3)(ii) | | 50.73(a)(2)(v)(C) | |
| | | 20.2203(a)(2)(iv) | | 50.73(a)(2)(i)(A) | | 50.73(a)(2)(v)(D) | |
| | | 20.2203(a)(2)(v) | | X 50.73(a)(2)(i)(B) | | 50.73(a)(2)(vii) | |
| | | 20.2203(a)(2)(vi) | | 50.73(a)(2)(i)(C) | | 50.73(a)(2)(viii)(A) | |
| | | 20.2203(a)(3)(i) | | 50.73(a)(2)(ii)(A) | | 50.73(a)(2)(viii)(B) | |
| 12. LICENSEE CONTACT FOR THIS LER | | | | | | | |
| NAME David W. Dodson, Supervisor Nuclear Station Licensing | | | | TELEPHONE NUMBER (Include Area Code) 860-447-1791 | | | |
| 13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT | | | | | | | |
| CAUSE | SYSTEM | COMPONENT | MANU- FACTURER | REPORTABLE TO EPIX | CAUSE | SYSTEM | COMPONENT |
| X | SB | RV | Dresser | N | | | |
| 14. SUPPLEMENTAL REPORT EXPECTED | | | | | 15. EXPECTED | | |
| <input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE). | | | | | <input checked="" type="checkbox"/> NO | | |
| | | | | | SUBMISSION DATE | | |
| | | | | | MONTH | | |
| | | | | | DAY | | |
| | | | | | YEAR | | |
| 16. ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) | | | | | | | |
| <p>With the plant in MODE 1 at 100% power on April 5, 2007 set pressure "simmer" testing of Unit 3 (MPS 3) Main Steam Safety Valves (MSSVs) was conducted per plant procedures. This testing was conducted just prior to the recent refueling outage. During the conduct of testing, two MSSVs failed to lift within the (+/- 3%) acceptance criteria. Valve 3MSS*RV22B lifted at 1221.3 psig. (1.3 psig above the set pressure range, approximately 3.1%), and 3MSS*RV22D lifted at 1232.8 psig. (12.8 psig above the set pressure range, approximately 3.8%). 3MSS*RV22B supports the B Steam Generator (SG) and valve 3MSS*RV22D supports the D SG. Both valves were subsequently adjusted/retested with the results within the required range of +/- 1%.</p> <p>Based on information provided by Electric Power Research Institute Report report TR-113560 (Investigation of MSSV High First Lift Phenomenon in Dresser 3700 Series MSSVs, Sept. 2000), industry experience, MSSV test history at Millstone, and engineering judgment, the failure of the MSSVs to lift within the required set pressure range is attributed to a corrosive oxide locking action between surface layer materials of the disc-seat interface sometimes referred to as "oxide locking" or "micro bonding".</p> <p>This condition is being reported pursuant to 10 CFR 50.73(a)(2)(i)(B) "Any operation or condition prohibited by the plant's Technical Specifications."</p> | | | | | | | |

LICENSEE EVENT REPORT (LER)

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| FACILITY NAME (1) Millstone Power Station - Unit 3 | DOCKET (2) 05000423 | LER NUMBER (6) | | | PAGE (3) 2 OF 4 |
| | | YEAR 2007 | SEQUENTIAL NUMBER 001 | REVISION NUMBER 00 | |

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

1. Event Description:

With the plant in MODE 1 at 100% power on April 5, 2007 set pressure "simmer" testing of Unit 3 (MPS 3) Main Steam Safety Valves (MSSVs) [SB, RV] was conducted per plant procedures. This testing was conducted just prior to the recent refueling outage. During the conduct of testing, two MSSVs failed to lift within the (+/- 3%) acceptance criteria. Valve 3MSS*RV22B lifted at 1221.3 psig. (1.3 psig above the set pressure range, approximately 3.1%), and 3MSS*RV22D lifted at 1232.8 psig. (12.8 psig above the set pressure range, approximately 3.8%). Valve 3MSS*RV22B supports the B Steam Generator (SG) and valve 3MSS*RV22D supports the D SG.

Plant Technical Specification (TS) 3.7.1.1 requires that all MSSVs be OPERABLE with lift settings as specified on Table 3.7-3. Table 3.7-3 "Steam Line Safety Valves Per Loop" provides the valve numbers and lift settings. TS 3/4. 7.1.1 BASES includes (in part):

"The OPERABILITY of the MSSVs is defined as the ability to open within the setpoint tolerances, relieve steam generator overpressure, and reset when pressure has been reduced." Table 3.7-3 "allows a +/- 3% setpoint tolerance (allowable value) on the lift setting for OPERABILITY to account for drift over an operating cycle."

"During this testing, the MSSVs are OPERABLE provided that the actual lift settings are within +/- 3% of the required lift setting. A footnote to Table 3.7-3 requires that the lift setting be restored to within +/- 1% of the required lift setting following testing to allow for drift during the next operating cycle."

Since the as-found lift pressures for 3MSS*RV22B and 3MSS*RV22D exceeded the +/- 3% TS allowable values these valves were not OPERABLE.

Since multiple MSSVs (two) exceeded the allowable technical specification limits and the cause indicates this occurred during operation, this condition is reportable under 10 CFR 50.73(a)(2)(i)(B), "Any operation or condition prohibited by the plant's Technical Specifications." This is consistent with the guidance provided in NUREG 1022 Rev. 2 section 3.2.2 "Operation or Condition Prohibited by Technical Specifications," Example (3) regarding multiple test failures. The actual time the valves were inoperable is not known as this condition has arisen over the period of time the valves have been installed. 3MSS*RV22B was refurbished and installed during a plant shutdown in April 2005. Valve 3MSS*RV22D was refurbished and installed during the MPS 3 refueling outage in May 2004. Prior to installation, lift set pressure was acceptably demonstrated at the vendor's facility.

2. Cause:

Based on information provided by Electric Power Research Institute Report report TR-113560 (Investigation of MSSV High First Lift Phenomenon in Dresser 3700 Series MSSVs, Sept. 2000), industry experience, MSSV test history at Millstone, and engineering judgment, the failure of the MSSVs to lift within the required set pressure range is attributed to a corrosive oxide locking action between surface layer materials of the disc-seat interface sometimes referred to as "oxide locking" or "micro bonding".

The MSSVs installed on MPS 3 are Dresser 3707R Safety Relief Valves equipped with stainless steel materials for discs and nozzle seats. Based on an evaluation, Dominion Nuclear Connecticut Engineering concluded these valves were subject to the known phenomenon of micro bonding. According to the EPRI report, when this model MSSV is refurbished, it is at its greatest risk for exhibiting the micro bonding

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

phenomenon. The EPRI report also concluded that "within the limits of detectability, no history of the micro bonding phenomena has been identified to date during actual plant transients, resulting in MSSV lifts". The MSSVs had not been tested since installed, and experienced micro bonding during the time period between overhaul and the MODE 1 scheduled "simmer" testing just prior to shutting down for the refueling outage in April of 2007.

3. Assessment of Safety Consequences:

This condition is judged to be of very low safety significance. Five steam line safety valves are installed on each of the unit's four main steam lines with nominal lift settings increasing in 10 psi increments from 1185 to 1225 psig. The safety valves protect the SG and portions of the main steam [SB] and feedwater systems [SJ] from overpressure conditions. The valves also serve as a heat sink for the reactor coolant system if the main condenser [COND] is unavailable and the atmospheric steam dump valves cannot relieve pressure following a reactor trip or secondary system accident. The limiting FSAR events with respect to main steam and reactor coolant overpressurization are those presented in FSAR Section 15.2, which involve a decrease in heat removal by the secondary system. The accidents presented in FSAR Section 15.2 assume all MSSVs open at a lift setting 3% higher than their nominal set pressure. The as-found condition of the tested valves determined valves with the lowest lift setting on two main steam lines had a setting greater than the allowed +3% tolerance. 3MSS*RV22B was found with a lift setting 1.3 psig above the maximum allowed value, and 3MSS*RV22D was found with a lift setting 12.8 psig above the maximum allowed value. The average lift setting of all MSSVs tested was approximately 1% above the nominal lift setting, or approximately 2% lower than that assumed in the FSAR Section 15.2 Safety Analyses. Therefore, it is concluded that the overall MSSV response of the as-found MSSV condition is bounded by the MSSV response assumed in the FSAR Section 15.2 Safety Analyses.

Additionally, the micro bonding phenomenon has been limited to static, in-situ testing. The EPRI report indicates that under actual transient high pressure conditions, disk movement/flexure breaks the micro bonding allowing the MSSVs to lift uninfluenced by this phenomenon.

4. Corrective Action:

Following the as-found lift, valve 3MSS*RV22B was subsequently "simmer" tested two additional times and the results were within the required as-left criteria of +/- 1% with no adjustments required. As a result of the initial lift outside of acceptable limits, for valve 3MSS*RV22B, two additional MSSVs were tested (3MSS*RV24B & 3MSS*RV25B). The as-found "simmer" tests for both of these valves were within the required range of +/- 3%.

Following the as-found lift, valve 3MSS*RV22D was subsequently "simmer" tested and the results were within the required as-found criteria of +/- 3%. However, one adjustment was necessary in order to meet the required as-left criteria of +/- 1%. As a result of the initial lift outside of acceptable limits for valve 3MSS*RV22D, two additional MSSVs were tested (3MSS*RV23A & 3MSS*RV23D). The as-found "simmer" tests for both of these valves were within the required range of +/- 3%.

Additional corrective actions to address micro bonding and the in-situ testing process will be evaluated in accordance with the station's Corrective Action Program.

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| FACILITY NAME (1) Millstone Power Station - Unit 3 | DOCKET (2) 05000423 | <table border="1"><tr><th>YEAR</th><th>LER NUMBER (6) SEQUENTIAL NUMBER</th><th>REVISION NUMBER</th></tr><tr><td>2007</td><td>- 001</td><td>- 00</td></tr></table> | YEAR | LER NUMBER (6) SEQUENTIAL NUMBER | REVISION NUMBER | 2007 | - 001 | - 00 | <table border="1"><tr><th colspan="3">PAGE (3)</th></tr><tr><td>4</td><td>OF</td><td>4</td></tr></table> | PAGE (3) | | | 4 | OF | 4 |
|--|--|--|------|--|--------------------|------|-------|------|--|----------|--|--|---|----|---|
| YEAR | LER NUMBER (6) SEQUENTIAL NUMBER | REVISION NUMBER | | | | | | | | | | | | | |
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5. Previous Occurrences:

On September 30, 2005, during the performance of set pressure "simmer" testing of MSSVs, valve 3MSS*RV25C failed to lift within the +/- 3% acceptance criteria. The allowable as-found set pressure range is 1179-1251 psig. The valve lifted at 1252.9 psig. The valve was lifted two additional times and the results were within the required as-left criteria of +/- 1% with no adjustments required. Two additional MSSVs were set pressure tested, to meet the ASME/OM code requirement for test expansion. These valves (3MSS*RV23C and 3MSS*RV24C) were satisfactorily tested. The as-left "simmer" tests for both of these valves were within the required as-left criteria of +/- 1%.

Energy Industry Identification System (EIIIS) codes are identified in the text as [XX].