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Millstone Power Station
Rope Ferry Road
Waterford, CT 06385

Dominion℠

SEP 0 8 2009

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

Serial No. 09-546
MPS Lic/GJC R0
Docket No. 50-336
License No. DPR-65

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 2
LICENSEE EVENT REPORT 2009-002-00
REACTOR COOLANT SYSTEM PRESSURE BOUNDARY LEAKAGE

This letter forwards Licensee Event Report (LER) 2009-002-00 documenting a condition discovered at Millstone Power Station Unit 2, on July 13, 2009. This LER is being submitted pursuant to 10CFR50.73(a)(2)(i)(B) as an operation or condition prohibited by Technical Specifications, and 10CFR50.73(a)(2)(ii)(A) as a degraded or unanalyzed condition.

If you have any questions or require additional information, please contact Mr. William D. Bartron at (860) 444-4301.

Sincerely,

A. J. Jordan
Site Vice President – Millstone

Attachments: 1

Commitments made in this letter: None

IE22
NRR

cc: U.S. Nuclear Regulatory Commission
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NRC FORM 366 (9-2007) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY IMB: NO. 3150-0104 EXPIRES 08/31/2010

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

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

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4. TITLE

Reactor Coolant System Pressure Boundary Leakage

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
										05000 -
07	13	2009	2009	- 002	- 00	09	08	2009	FACILITY NAME	DOCKET NUMBER 05000 -

9. OPERATING MODE

Mode 3

10. POWER LEVEL

000

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☒ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER *(Include Area Code)*
William D. Bartron, Nuclear Station Licensing	(860) 444-4301

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

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

On July 13, 2009 prior to start-up from a forced shutdown with Millstone Power Station Unit 2 (MPS2) in mode 3 (hot standby) at 0% reactor power, a reactor coolant system (RCS) pressure boundary leak in the MPS2 'A' reactor coolant pump (RCP) seal cooler region was identified by a technician conducting a system walk-down at normal operating pressure/normal operating temperature (NOP/NOT). Chemical analysis of the fluid emitting from the leak conclusively identified the fluid to be reactor coolant. In accordance with Technical Specification 3.4.6.2 action b, MPS2 immediately commenced a cool down to mode 5 (cold shutdown).

The pressure boundary leakage was determined to be the result of a weld defect from original fabrication of the 'A' RCP seal cooler. The weld was repaired and the unit was started up and returned to service.

This condition is being reported in accordance with 10CFR50.73(a)(2)(i)(B) as an operation or condition prohibited by Technical Specifications, and 10CFR50.73(a)(2)(ii)(A) as a degraded or unanalyzed condition.

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NARRATIVE

1. EVENT DESCRIPTION:

On July 13, 2009 prior to start-up from a forced shutdown, which began on July 3, 2009, while Millstone Power Station Unit 2 (MPS2) was in mode 3 (hot standby) at 0% reactor power, a reactor coolant system (RCS) [AB] pressure boundary leak the MPS2 'A' reactor coolant pump (RCP) seal cooler [P SEAL CLR] region was identified by a technician conducting a system walk-down at normal operating pressure/normal operating temperature (NOP/NOT). Chemical analysis of the fluid emitting from the RCP seal cooler leak conclusively identified the fluid to be reactor coolant. If RCS pressure boundary leakage exists, Technical Specification (TS) 3.4.6.2 action b requires MPS2 be in mode 4 (hot shutdown) within 6 hours and be in mode 5 (cold shutdown) within 36 hours. MPS2 was in mode 3 hot standby and in accordance with TS 3.4.6.2 action b, the unit immediately commenced a cool down to mode 5 (cold shutdown). This condition is being reported in accordance with 10CFR50.73(a)(2)(i)(B) as an operation or condition prohibited by Technical Specifications, and 10CFR50.73(a)(2)(ii)(A) as a degraded or unanalyzed condition.

2. BACKGROUND:

The 'A' RCP on MPS2 has an integral tube in tube heat exchanger which is permanently attached to the pump cover. This heat exchanger surrounds the labyrinth seal and provides cooling of the RCS water prior to entering the seal. This heat exchanger is referred to as the pump seal cooler and is comprised of two rows of six coils circling the RCP seal. The inner tube of the tube-in-tube configuration carries the high pressure RCS water. The outer tube carries the low pressure component cooling water (RBCCW).

Both streams of RCS fluid exit the coil at the top of the coil assembly (one from the inside coil and one from the outside coil). The outlet of the coils is directed thru either a welded 90 degree elbow or a block configuration welded to a short length of 1.5 inch diameter tubing and 1.25 diameter inch pipe, which carries the cooled RCS flow to the seal housing and seal cartridge.

The rotating assembly, the pump cover, and integral heat exchanger for the 'A' RCP were replaced in 1992 with parts provided by the original equipment manufacturer Byron Jackson.

Characterization of the Weld Flaw

The leak in the RCP seal cooler was found in the weld that joins the inner tube of the inside coil to the block which turns the flow 90 degrees towards the pump seal. The leak was coming from the toe of the tube to block fitting weld. The leak rate was visually estimated to be 25 to 30 cc/minute (< 0.0 1 gpm). Chemistry sampled the leak and determined that it was comprised of RCS coolant only; no RBCCW water was present.

Examination of the indications identified by the liquid penetrant (PT) examinations performed during excavation of the defect identified a cluster of welding porosity one sixteenth of an inch deep into the tube in the center of the leaking spot. This weld porosity acted as the nucleation site for fatigue cracks.

3. CAUSE:

The cause of the RCS leak in the seal cooler was a historic weld defect, specifically a cluster of porosity in the inner tube to block weld on the inside coil of the seal cooler. Vibration induced fatigue at the weld defect caused the defect to propagate and caused the pressure boundary leak.

This weld was made during original construction of the RCP seal cooler by the manufacturer (1992). The weld data sheets for this weld indicated that it passed the ASME Code required PT examinations during weld preparation and upon completion of welding. No volumetric examination, such as a radiographic examination (RT) was required. The weld defect section was not available for lab analysis due to the fact that grinding was performed as part of the weld repair process.

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4. ASSESSMENT OF SAFETY CONSEQUENCES:

This condition was determined to be of low safety significance for the following reasons:

1. The leak rate was well with-in the capacity of the charging pump(s) for make up to the RCS.
2. During excavation of the leak location the defect was noted to have propagated in an angular orientation. This specific orientation was essentially self-limiting since, as the defect propagated into the weld, the material became thicker and would function to slow the rate of growth of the flaw, such that it would not have progressed to the point of breaking.
3. In the worst case if the tube had broken completely the RCS leakage from the RCP seal cooler tube is bounded by existing Combustion Engineering Owners Group (CEOG) Task 656 Final Report, and would be classified as a small break LOCA. A small break LOCA is bounded by the design of MPS2 as described in Chapter 14 of the Final Safety Analysis Report (FSAR).
4. The extent of condition was evaluated as follows:
   a. Approximately one sixth of the weld in the area of the leak was repaired and rigorously inspected utilizing the RT, PT and visual (VT) inspection methods. No indication of defects were found.
   b. To the extent possible, additional weld areas on the RCS pressure boundary tubing and piping welds of the 'A' RCP seal cooler were inspected utilizing the PT and VT inspection methods. No indication of defects were found.
   c. To the extent possible, equivalent weld areas on the RCS pressure boundary tubing and piping welds of the 'B'. 'C', 'D', and spare RCP seal coolers were inspected utilizing the PT and or VT inspection methods. No indication of defects were found.
   d. This condition does not apply to the Millstone Power Station Unit 3 (MPS3) RCPs. The MPS3 RCPs are Westinghouse pumps with coolers internal to the pump.

5. CORRECTIVE ACTION:

The weld defect was repaired on July 17, 2009. Containment walk-downs of the weld repair were completed at NOP/NOT conditions on July 24, 2009 and no leakage was noted.

Additional corrective actions will be evaluated in accordance with the station's corrective action program.

6. PREVIOUS OCCURRENCES:

No previous similar events/conditions were identified.

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