Dominion Nuclear Connecticut, Inc.
5000 Dominion Boulevard, Glen Allen, Virginia 23060
Web Address: www.dom.com

Dominion®

September 29, 2011

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

Serial No. 11-476A
NLOS/MAE R0
Docket No. 50-336
License No. DPR-65

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 2
SUPPLEMENT TO RELIEF REQUEST RR-04-12 FOR THE TEMPORARY NON-CODE COMPLIANT CONDITION OF THE CLASS 3 SERVICE WATER SYSTEM 10 INCH EMERGENCY DIESEL GENERATOR SUPPLY PIPING FLANGE

By letter dated August 19, 2011, and supplemented by an email dated August 20, 2011, Dominion Nuclear Connecticut, Inc. (DNC) requested relief from certain Section XI requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (ASME Code) for Millstone Power Station Unit 2 (MPS2). Relief Request RR-04-12 was based on the hardship of performing required ASME Code repair/replacement activities to a degraded piping flange on spool SK2952 in the 'A' train 10-inch service water (SW) supply line to the emergency diesel generator (EDG) heat exchangers.

On August 20, 2011, pursuant to 10 CFR 50.55a(a)(3)(ii), the Nuclear Regulatory Commission (NRC) staff verbally authorized the use of Relief Request RR-04-12 for a period of four months from the date of the verbal authorization or until the limits of 1 gpm leak rate, minimum wall thickness of 0.04 inches, or loss of 33% flange material was reached, whichever occurred first.

On September 3, 2011, the leak rate exceeded the 1 gpm limit specified in the verbal approval of the relief request. Accordingly, MPS2 entered Technical Specification (TS) 3.7.4.1, "Service Water System," action statement for one SW loop inoperable and the plant was subsequently shutdown. The TS 3.7.4.1 action statement was completed by reaching cold shutdown on September 4, 2011.

Following the MPS2 shutdown, and as a result of the through-wall leak identified on the carbon steel flange of the 'A' train SW supply line to the 'A' EDG heat exchangers, an extent of condition inspection was performed on the entire safety-related portion of the SW system.

As requested by the NRC, DNC is submitting this letter to provide the results of the extent of condition inspections performed on the MPS2 SW piping after the unit was shutdown on September 4, 2011.

Disassembly of the degraded flange identified that the insulation kit designed to electrically isolate the carbon steel flange from the mating AL6XN stainless steel (SS) flange was improperly installed and was not effective. The insulation kits are designed to

A047
NRR

prevent accelerated galvanic corrosion of the coated carbon steel in the event of a defect in its coating. Drawings were reviewed to identify other locations where carbon steel or cast iron is connected to AL6XN or 300 series SS flanges in both trains of SW.

Further review determined that 300 series SS flanges that mate with AL6XN flanges, although less susceptible than carbon steel, are still susceptible to galvanic corrosion. Therefore, 300 series SS flanges were added to the scope of inspection. Additionally, other materials (monel and hastalloy) are mated to AL6XN flanges in the SW 'B' train and were also added to the inspection scope.

MPS2 has been replacing the coated carbon steel piping and flanges in the SW system with AL6XN. During each refueling outage, one train of SW is worked on an alternating basis, and significant sections of piping have been replaced. During the last refueling outage (2R20), sections of the 'B' train piping were replaced. Since replacement work was most recently performed on the 'B' train, the priority for inspection was placed on the 'A' train SW piping. In addition, inspections of unisolable 'B' train piping were completed.

The 'A' train inspections involved both ultrasonic examination (UT) and visual examination. The visual examination was an enhanced VT-2 examination (insulation removed, close proximity). The 'B' train inspections were enhanced VT-2 examinations on the unisolable sections. Because of the failure mechanism, initial inspection focused on flanges, as described above. It should be noted that not all identified points were inspected because of accessibility or ability to inspect (e.g., buried). Review is continuing on other types of dissimilar metal joints (e.g. 300 series to AL6XN welds) which will be inspected after MPS2 restart. Schedules for these inspections are under development but all inspections will be completed no later than the end of the next refueling outage. The following is a summary of the flanges that were inspected and the results:

'A' Train Service Water

- Coated carbon steel or cast iron to AL6XN or 300 series SS identified: 36

  No UT (and no VT-2 due to configuration): 2
  Inspected by UT: 27
  Inspected by enhanced VT-2 examination: 34
  No UT (inspected by enhanced VT-2): 7

  Deficiencies: One deficiency was identified by UT at the outlet of the 'A' EDG where a 300 series SS expansion joint was mated to a carbon steel flange. The flange was replaced prior to returning the EDG tc service. The ability of UT to detect this flange degradation (which was minor) provides additional confidence that this is a viable tool for this purpose.

- 300 series SS to AL6XN identified: 10

  Inspected by UT: 8
  Inspected by enhanced VT-2: 10

  Deficiencies: One deficiency was identified at a tap for a local pressure indicator in the supply line to the EDG. This defect was a very small through-wall leak that was observed after insulation was removed while preparing for a UT examination. It was determined the pressure indicator is not required to properly operate the system under any condition. The defective flange was replaced with a similar blank flange with a full face rubber gasket, isolating the 316 SS flange from the fluid.

'B' Train Service Water

- Coated carbon steel or cast iron to AL6XN or 300 series SS identified: 36 (9 unisolable)

  No VT-2 due to configuration: 1
  Inspected by enhanced VT-2: 8
  No deficiencies identified

- 300 series SS to AL6XN identified: 12 (3 unisolable)
  Inspected by enhanced VT-2: 3
  No deficiencies identified

- Other materials (i.e., 4 monel and 1 hastalloy) to AL6XN identified: 5 (1 unisolable)
  Inspected by enhanced VT-2: 1
  No deficiencies identified

The degraded flanges that were replaced, including the failed flange, were evaluated to determine the effect of the degradation on the performance of the system. In all cases, the degraded flanges retained sufficient material to ensure structural integrity and did not present a flow diversion issue. In particular, the failed flange could have leaked up to 50 gpm and design basis analyses indicate that required flow would have been maintained to all components. This analysis uses a 10% degraded pump curve. Using a pump curve consistent with recent pump test performance, leakage of up to 350 gpm would still allow adequate flow to all components in the system.

As a compensatory measure, the leakage from the degraded flange was collected and directed to drains during normal plant operation. The leakage was observed to quickly increase such that the installed collection system was inadequate to contain and direct the flow. At the observed leak rate, flooding of safety related equipment would not have

been a concern for several days, however, maintenance personnel applied a temporary patch to reduce the leakage to about 1 gpm. Because of the actions taken, flooding was not a concern.

It has been concluded that the system has been able to perform its safety function. The recent repairs and the continuing inspections will ensure that the system will continue to reliably support its safety function.

If you have any questions regarding this submittal, please contact Wanda Craft at (804) 273-4687.

Sincerely,

J. Alan Price
Vice President – Nuclear Engineering

Attachments:

None

Commitments made in this letter:

None

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

C. J. Sanders
Project Manager - Millstone Power Station
U.S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Mail Stop O-8B3
Rockville, MD 20852-2738

NRC Senior Resident Inspector
Millstone Power Station