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

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Docket No. 50-336
License No. DPR-65

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 2
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING 10 CFR 50.55a RELIEF REQUEST (RR) 89-65 and 89-66; TEMPORARY NON-CODE REPAIR OF THE CLASS 3 SERVICE WATER SYSTEM EMERGENCY DIESEL GENERATOR JACKET WATER HEAT EXCHANGER AND AIR COOLER HEAT EXCHANGER (TAC NOs. ME0440 and ME0441)

By letter dated January 20, 2009 (Serial No. 08-0736), Dominion Nuclear Connecticut, Inc. (DNC) submitted requests for relief from the Section XI requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, pursuant to 10 CFR 50.55a(g)(5)(iii). The relief requests pertain to the temporary non-code repair of Class 3 service water system 'A' emergency diesel generator (EDG) jacket water heat exchanger X-45A and Class 3 service water system 'B' EDG air cooler heat exchanger X-83B.

On April 6, 2009, the Nuclear Regulatory Commission (NRC) staff issued a request for additional information (RAI). DNC's response to the RAI is provided as an attachment to this letter.

If you have any questions or require additional information, please contact Wanda Craft at (804) 273-4687.

Sincerely,

J. Alan Price
Vice President – Nuclear Engineering

Attachment: Response to Request for Additional Information Temporary Non-Code Repair of the Class 3 Service Water System Emergency Diesel Generator Jacket Water Heat Exchanger X-45A and Air Cooler Heat Exchanger X-83B

Commitments made in this letter: None

cc: U.S. Nuclear Regulatory Commission
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ATTACHMENT

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION TEMPORARY NON-CODE REPAIR OF THE CLASS 3 SERVICE WATER SYSTEM EMERGENCY DIESEL GENERATOR JACKET WATER HEAT EXCHANGER X-45A AND AIR COOLER HEAT EXCHANGER X-83B

MILLSTONE POWER STATION UNIT 2
DOMINION NUCLEAR CONNECTICUT, INC.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

In reviewing the Dominion Nuclear Connecticut, Inc. (DNC) relief requests (RRs) 89-65 and 89-66 dated January 20, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML090210296) regarding the temporary non-code repair for Millstone Power Station Unit 2 (MPS2) Class 3 service water system 'A' emergency diesel generator (EDG) jacket water heat exchanger and Class 3 service water system 'B' EDG air cooler heat exchanger, the Nuclear Regulatory Commission (NRC) staff has determined that the following information is needed in order to complete its review:

NRC Question No. 1

In Attachment 2, Section 6.6, "Extent of Condition," of the original application, it appears that the "B" EDG Air Cooler Heat Exchanger was referenced where the "A" EDG Jacket Water Heat Exchanger should be. Please clarify or correct.

DNC Response

Section 6.6 of Attachment 2 page 8 of 15 states, "*Extent of Condition - All the other identical EDG channel heads of the SW heat exchangers were visually examined at the time of discovery of the leak of the X-45A channel head, and only the 'B' EDG Air Cooler X-83B Heat Exchanger has been identified to show a location of additional leakage.*" The component references in this statement are correct. The extent of condition inspection described in this attachment (for the 'B' EDG) is the same extent of condition inspection described in Attachment 1 page 8 of 15 (for the 'A' EDG). There are a total of 12 similar heat exchanger channel heads on the two EDGs. The extent of condition inspection prompted by the leak on the ('A' EDG Jacket Water Heat Exchanger) X-45A channel head resulted in only one other leak and that leak was on the X-83B channel head on the 'B' EDG.

NRC Question No. 2

What is the trend in the leak rate of the "A" EDG Jacket Water Heat Exchanger and the "B" EDG Air Cooler Heat Exchanger?

DNC Response

There has been no change in the leakage rate of either heat exchanger. The leakage remains a slow weep (< 1 drop/15 minutes).

NRC Question No. 3

In section 2.0(e) of Code Case N-513-2, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division 1," a frequent periodic inspection of no more than 30 day intervals shall be used to determine if flaws are growing. Alternatively, a flaw growth evaluation may be performed to predict the time at which the detected flaw will grow to the allowable size. When a flaw growth analysis is used to establish the allowable time, periodic examinations of no more than 90 day intervals shall be conducted to verify the flaw growth analysis predictions. Was a flaw growth analysis done for either EDG? If a flaw growth analysis was done, please justify why periodic examinations of no more than 90 day intervals do not need to be performed?

DNC Response

(a) A flaw growth evaluation was performed for each of the two defects found on the X-45A and X-83B channel heads and is described respectively in Attachments 1 and 2 of the submittal. The flaw growth evaluation is based on the characterization of the defects and their possible mechanisms for future growth. Referring to the X-45A channel head as an example, Attachment 1 Section 6.1, page 5 of 15, characterizes the flaw based on the results of the nondestructive examination (NDE) as "most likely the result of several small pores (including the 1/16 inch indication) that linked together to create a leak path from the inside to the outside surface." The paragraph further states, "For structural evaluation purposes, the defect is conservatively assumed to be a one inch diameter through wall defect surrounded by sound material." The subsequent two paragraphs describe the assessment for potential future growth of the defect, considering general corrosion and dealloying as credible mechanisms. A corrosion rate of 0.002 inches per year is cited for both general corrosion and dealloying, and is estimated to "take years to reach the evaluated [flaw] size." This same assumed 0.002 inch corrosion rate over one year is included as a reduction in measured wall thickness in the structural evaluation on page 15 of 16. Attachment 2 provides a similar evaluation for the X-83B channel head. Thus the required flaw growth evaluations were performed for both EDGs.

(b) The program for NDE monitoring of the two defects is described in Section 6.7 of each attachment. Briefly, in addition to the original NDE performed to characterize the defects, the section describes a near term follow-up radiography test (RT), which was performed within approximately 30 days from time of discovery for X-45A and 50 days for X-83B. For each channel head it also describes another RT examination for each of the two defects approximately 90 days from the first follow-up RT exams. This 90 day RT for X-45A was performed on 2/17/2009 and reviewed in comparison to the two prior examinations of the same location on 11/7/2008 and 12/4/2008. The review identified no change in the defect. The additional 90 day RT examination for X-83B was completed on 4/8/2009. It too showed no change in the defect

indication. The volumetric NDE described above is in addition to periodic leak monitoring activities described in the relief request and these latter results are consistent with the finding of no change to the defects over approximately five months time. Thus the initial several months of monitoring of the defects is fully consistent with Code Case N-513-2 and substantiates the conclusion that the defects are not growing.

The relief request references Code Case N-513-2 as a generally acceptable method of dealing with leakage from a flaw in a moderate energy component. The code case is intended for application to a wide variety of systems, operating conditions, flaw mechanisms and growth rates. As such, it does not have allowances for specific situations that may constitute a less severe combination of such factors. Also, each RT examination presents an increment of radiological risk that should be avoided if reasonably possible. For the specific case of the heat exchanger channel heads, the following factors should be considered: the very moderate operating conditions, the absence of a potentially unstable planar flaw, and the effectiveness of leak monitoring activities as an equivalent method of confirming the stability of the defect against significant extension or sudden rupture. Thus, the basis for not proposing a continuing series of periodic RT examinations beyond those described in the relief requests is (1) the potential mechanisms for defect growth are very slow and there is no potential for sudden rupture, and (2) the leak monitoring activities that will continue are more frequent than the volumetric examination frequency and are a better measure of potential defect growth than a continuing series of RT examinations.

The original relief request supplemented by this response contains a complete discussion of the characterization of the defect and its extremely low potential for rupture. Of greatest importance is the fact that the defects are not characterized as planar flaws or areas of significant wall loss, since these two conditions would have the greatest potential for sudden rupture. The effectiveness of the periodic, twice daily observation of leakage supplemented by a more formal visual assessment approximately every 30 days (as described in Section 6.7 of both attachments) is based on the very low observed leak rate combined with a limited and directly observable mechanism for leak rate change. Lacking a planar flaw, the leak flow is limited by the diameter of the leakage path through the wall thickness. A significant increase in leak flow (for example, from occasional drops to frequent drops or steady flow) would be considered an increase in defect size and would be further investigated through the corrective action program. In contrast, given no indications of increased leakage flow being observed to date, additional RT examination beyond the first three already performed is not commensurate with the incremental radiological risk because the RT does not provide a direct measure of leak flow potential and the structural evaluation confirms that a very large flaw (one inch diameter hole) would remain stable.

There is thus a large available margin between detection of a change in the defect size and its stable limit.

In summary, the specifics of this case describe a relatively benign situation compared to the range of cases that are within the scope of Code Case N-513-2. The RT examinations already performed on the channel heads confirm the stability of the observable NDE indications and the continual leak monitoring as already implemented would provide an immediate notice of any change in the defect conditions well in advance of them becoming significant. Therefore, continued RT examinations provide little value and are not commensurate with the incremental radiological risk of performing the RT. Without specific indication of increased leakage, additional RT examinations are not warranted.