October 16, 2003

MEMORANDUM TO: James W. Clifford, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

FROM: Richard B. Ennis, Senior Project Manager, Section 2 ***/RA/***
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: MILLSTONE POWER STATION, UNIT NO. 2,
FACSIMILE TRANSMISSION, ISSUES TO BE DISCUSSED IN AN UPCOMING CONFERENCE CALL (TAC NO. MC0942)

The attached information was transmitted by facsimile on October 16, 2003, to Mr. David Dodson of Dominion Nuclear Connecticut, Inc. (the licensee). This information was transmitted to facilitate a upcoming conference call in order to clarify the licensee's relief request RR-89-48 for Millstone Power Station, Unit No. 2 (MP2) dated October 3, 2003, as supplemented on October 10, 2003. The licensee's submittal requests relaxation from the certain requirements of NRC Order EA-03-009 pertaining to inspection of the MP2 reactor pressure vessel control element drive mechanism penetration nozzles.

This memorandum and the attachment do not convey a formal request for information or represent an NRC staff position.

Docket No. 50-336

Attachment: Issues for Discussion in Upcoming Telephone Conference

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NAME	REnnis
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ISSUES FOR DISCUSSION IN UPCOMING TELEPHONE CONFERENCE

RELATED TO RELIEF REQUEST RR-89-48

RELAXATION OF THE REQUIREMENTS OF ORDER EA-03-009 REGARDING

REACTOR PRESSURE VESSEL HEAD INSPECTIONS AT

MILLSTONE POWER STATION, UNIT NO. 2

DOCKET NO. 50-336

On February 11, 2003, the U.S. Nuclear Regulatory Commission (NRC) issued Order EA-03-009 requiring specific inspections of the reactor pressure vessel (RPV) head and associated penetration nozzles at pressurized water reactors. The NRC issued an errata to the Order on March 14, 2003, to correct an administrative part of the Order related to requests for relaxation of the Order requirements. Section IV.F of the Order states that requests for relaxation associated with specific penetration nozzles will be evaluated by the NRC staff using its procedure for evaluating proposed alternatives to the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) in accordance with Section 50.55a(a)(3) of Title 10 of the *Code of Federal Regulations* (10 CFR 50.55a(a)(3)).

Sections IV.A and IV.B of the Order provide criteria to categorize each plant's RPV head with respect to its susceptibility to primary water stress corrosion cracking (PWSCC). For plants such as Millstone Power Station, Unit No. 2 (MP2), with RPV heads that are categorized as being highly susceptible to PWSCC, Section IV.C(1)(b) of the Order requires that the RPV head penetration nozzles be inspected each refueling outage using either of the following techniques: (1) ultrasonic testing (UT) from two inches above the J-groove weld to the bottom of the nozzle and an assessment to determine if leakage has occurred in the interference fit zone, or (2) eddy current testing or dye penetrant testing (PT) of the wetted surface of each J-groove weld and nozzle base material to at least two inches above the J-groove weld.

By letter dated October 3, 2003, as supplemented on October 10, 2003, Dominion Nuclear Connecticut, Inc. (DNC or the licensee) requested relaxation from the requirements in Section IV.C(1)(b) of the Order for MP2. The relaxation request was made pursuant to the procedure specified in Section IV.F of the Order. Specifically, for inspection of the RPV control element drive mechanism (CEDM) penetration nozzles, DNC requested authorization to use a combination of UT and PT on the nozzle base material, and reduced examination coverage below the weld in the non-pressure boundary portion of the nozzle.

The NRC staff has reviewed the information the licensee provided that supports the proposed relief request and would like to discuss the following issues to clarify the submittal:

1) How will the PT surface examinations be expanded to additional CEDM penetration nozzles if indications are found? What will be the criteria for expansion?

ATTACHMENT

2) Provide the scope of the PT surface examinations, and the flaw tolerance on each CEDM penetration. What is the proposed area to be examined? Will the examination be 360° around the nozzle? Provide a drawing or drawings showing the area to be examined by PT. Will the surface examination be performed to the bottom of the nozzle?

3) Does the structural integrity evaluation use the crack-growth formula in industry report MRP-55? The staff has not made a determination on the subject industry report. Therefore, if using MRP-55 agree to and document the following condition:

> If the NRC staff finds that the crack-growth formula in industry report MRP-55 is unacceptable, the licensee shall revise its analysis that justifies relaxation of the Order within 30 days after the NRC informs the licensee of an NRC-approved crack growth formula. If the licensee's revised analysis shows that the crack growth acceptance criteria are exceeded prior to the end of the current operating cycle, this relaxation is rescinded and the licensee shall, within 72 hours, submit to the NRC written justification for continued operation. If the revised analysis shows that the crack growth acceptance criteria are exceeded during the subsequent operating cycle, the licensee shall, within 30 days, submit the revised analysis for NRC review. If the revised analysis shows that the crack growth acceptance criteria are not exceeded during either the current operating cycle or the subsequent operating cycle, the licensee shall, within 30 days, submit a letter to the NRC confirming that its analysis has been revised. Any future crack-growth analyses performed for this and future cycles for RPV head penetrations must be based on an acceptable crack growth rate formula.

4) What was the range of the UT examinations that were performed on the CEDM penetration nozzles during the last outage (distance above and below the weld for the 69 CEDM head penetrations)? How is it different than what is required in the Order? Were other examination methods used? What other examinations were performed? What were the results?

5) How were the UT examinations performed during the last outage? Discuss what probes where used. How were indications dispositioned? How was the UT qualified for the last outage?

6) For Table 1 (on Attachment 1, page 12) in the submittal dated October 3, 2003, provide a drawing identifying - minimum weld height, end point elevation, weld elevation. What is used as the reference point?

7) It is unclear how the predicted time for a flaw to grow to a point of contacting the weld of 1.9 years of operation provides adequate margin for the 1.5 years required for the next plant cycle. Describe uncertainties in this calculation (e.g., stress levels, crack growth rate, etc.) and the uncertainty in the result.

8) Discuss the basis for the 0.38 inch level below the J-groove weld. From what point on the J-groove weld will the 0.38 inches be measured?

ATTACHMENT

9) Provide a cross sectional figure of the head and penetrations showing how far each penetration protrudes below the bottom surface of the head using as built dimensions and considering the UT results from the last inspection. Are there any photos from the last or previous outages? If so provide any photos that show how far the penetrations protrude below the head.

10) Describe the meaning of the statement on page 7 of Attachment 1 of the submittal dated October 3, 2003, "The establishment of the 0.38-inch minimum coverage is consistent with the approach that is described in Footnote 1 of the NRC Order EA-03-009 for the criteria to set the necessary height of the surface examination."

Footnote 1 refers to "Flaw Evaluation Guidelines" and not the setting of minimum coverage.

11) Page 7 of Attachment 1 of the submittal dated October 3, 2003, states, "As noted in reference 3, prediction of crack growth is required for only one cycle of operation." Where in reference 3 (Order EA-03-009) is this noted? Provide justification and clarification of this statement.

12) Does the crack growth analysis consider growth in the base metal to the "fillet weld cap" or the "J-groove weld" in setting the required inspection scope? The fillet weld cap should be used to preclude the possibility of rapid crack growth in the weld metal.