May 19, 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: DOCUMENTATION OF CONFERENCE CALLS REGARDING REQUEST FOR RELAXATION FROM SECTION IV.C(a)(1) OF THE ORDER ESTABLISHING INTERIM INSPECTION REQUIREMENTS FOR REACTOR PRESSURE VESSEL HEADS, MILLSTONE POWER STATION, UNIT NO. 2 (TAC NO. MB8164)

Background

On April 24, and May 5, 2003, the Nuclear Regulatory Commission (NRC) staff held conference calls with Dominion Nuclear Connecticut, Inc. (DNC or the licensee), to discuss a Request for Additional Information (RAI) dated April 21, 2003, pertaining to Millstone Power Station, Unit No. 2 (MP2). The RAI was issued by the NRC staff in response to DNC's request for relaxation from Section IV.C(1)(a) of NRC Order EA-03-009 (Order) that was issued on February 11, 2003. The Order established interim inspection requirements for reactor pressure vessel (RPV) heads at pressurized water reactors.

Section IV.C(1)(a) of the Order pertains to plants that are highly susceptible to primary water stress corrosion cracking and requires that bare metal visual (BMV) examination of 100% of the RPV head surface (including 360° around each RPV head penetration nozzle) be performed every refueling outage. In a letter dated March 28, 2003, the licensee requested a one-time relaxation from these requirements which would apply during the upcoming Fall 2003 refueling outage. The licensee's letter states that actions to replace the MP2 RPV head during the Spring 2005 refueling outage have been initiated. In place of the BMV examination required by the Order, the licensee proposes the use of ultrasonic testing (UT) of the low alloy steel RPV head material from the clad surface underside of the RPV head to detect RPV head thickness and then survey for corrosion. The licensee committed to compliance with the remaining Order requirements of Section IV.C(1)(b)(i) by performing UT of each RPV head penetration nozzle from two (2) inches above the J-groove weld to the bottom of the nozzle and an assessment to determine if leakage has occurred into the interference fit zone.

The NRC staff participating in the April 24, 2003, conference call were: Rick Ennis, Steven Bloom, Jay Collins, and Allen Hiser. The NRC staff participating in the May 5, 2003, conference call were: Rick Ennis, Jay Collins, and Allen Hiser. Ravi Joshi represented DNC in both calls. Several other DNC staff were also involved in the calls.

The following summarizes the discussions during the calls:

April 24, 2003, Conference Call

Since the licensee has requested expedited review and approval of the relaxation request by May 30, 2003, to support planning for the Fall 2003 outage, it was decided to hold a conference call to ensure that the proposed RAI response provided the information the staff needs to complete the review. The following issues were discussed:

1) The staff asked if the insulation around the RPV head penetration nozzles could be removed such that BMV examination of the nozzle to RPV head interface could be performed. The licensee indicated that the insulation contains asbestos and there would a high dose to the workers due to the measures necessary for asbestos abatement.

2) The NRC staff stated that if the licensee does not plan to do BMV examination of the RPV head surface to nozzle penetration interface, additional information would be required (e.g., specific hardship information, additional nondestructive examination (NDE), etc.). The staff clarified that this inspection area, looking for boron deposits, was a required piece of the total BMV examination to provide defense-in-depth coverage to the currently unqualified nozzle UT assessment for potential leak paths.

3) The staff stated that the UT thickness method needs to be qualified. The licensee indicated that they were looking into using a mockup of an RPV head to qualify the method.

4) The staff indicated that more information was needed about the specific details of the UT thickness scanning procedure (e.g., beam angles, coverage). The licensee agreed to docket the UT thickness procedure when it is completed.

5) The licensee stated that the minimum design thickness of the low allow steel in the RPV head is 7 3/8″ and the nominal thickness of the cladding is 5/16″ (i.e., total design thickness is 7 11/16″). However, there are no drawings showing the actual as-built thickness of the head. The licensee indicated that if the UT thickness scanning indicated that the thickness was less than 7 11/16″, then that would be considered “significant degradation” requiring corrective action. The staff raised a concern that due to potential variability in the RPV head thickness, if the as-built thickness in some areas was greater than 7 11/16″, active degradation could go undetected by the proposed criteria. The licensee agreed to reconsider the acceptance criteria.

It was agreed that another call was necessary to further discuss the proposed relaxation request.

May 5, 2003, Conference Call

The following issues were discussed:

1) The licensee updated their hardship dose estimate in performing a complete BMV examination of the RPV head. The dose is estimated by the licensee to be 35 rem if the complete insulation package is removed and replaced, or possibly as low as 25 rem with dose reduction measures.

2) The licensee stated that it would be a hardship in performing BMV examination of the RPV head penetration nozzles to RPV head surface interface by removing only the nozzle insulation restraining collars for boroscope inspection. The insulation collars on 59 nozzles have an asbestos covering, and the covering is dry and brittle. The licensee stated that the primary method of asbestos abatement provided in Connecticut state law would require the insulation to be wetted down before removal, although other methods are also permissible as long as additional requirements are met. The licensee indicated that wetting the insulation will likely remove any evidence of boron deposits. The inner 10 nozzles have stainless steel clad mirror insulation which cannot be removed without removing the connecting insulation panels.

3) The staff reminded the licensee that one purpose of the BMV examination of the RPV head is to detect deposits indicating nozzle leakage to complement the leakage assessment from the UT measurement described in the Order, Section IV.C(1)(b)(i). In lieu of this purpose of the BMV examination, the staff stated it was unlikely to approve a relaxation request that does not have a compensatory method to identify deposits at the RPV head to nozzle interface.

4) The licensee has reconsidered the acceptance criteria for determining “significant degradation” (see item 5 for the April 24, 2003 call). They have decided to also include the criteria “gross degradation” to look for local variation in thickness from surrounding areas.

5) The staff noted that the following issues need to be addressed in the submittal:

   a) information on qualification of the UT thickness method including the uncertainties/errors;

   b) submittal of the UT thickness scanning procedure;

   c) definition of “significant degradation” and “gross degradation;” and

   d) information on the criteria for when additional NDEs will be used.

The licensee said they would inform the staff later in the week whether another call was needed.

On May 8, 2003, Ravi Joshi, of DNC, called Rick Ennis and stated that they hope to have more information next week on when a response could be expected and when we could schedule another call. Mr. Joshi indicated that DNC no longer expects the NRC to complete the review of the relaxation request by May 30, 2003, due to the delay in responding to the RAI questions.

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