Progress Energy

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DEC 2 2 2003

Mr. James E. Dyer
Director, Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, DC 20555-0001

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23

REVISION TO THE REQUEST FOR RELAXATION FROM THE ORDER FOR ESTABLISHING INTERIM INSPECTION REQUIREMENTS FOR REACTOR PRESSURE VESSEL HEADS AT PRESSURIZED WATER REACTORS (EA-03-009)

Dear Mr. Dyer:

By letter dated August 15, 2003, Progress Energy Carolinas, Inc. (PEC), provided a request for relaxation of the subject Order in accordance with the provision of the Order that states the Director, Office of Nuclear Reactor Regulation, may, in writing, relax or rescind any of the conditions of the Order upon demonstration by the licensee of good cause. Supplemental information in support of the August 15, 2003, relaxation request was provided by letter dated November 21, 2003.

In a telephone conference with NRC Nuclear Reactor Regulation personnel on Thursday, December 11, 2003, H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, representatives were informed that the indications recently found at Millstone 2 present concerns for the NRC staff reviewers. During that discussion, HBRSEP, Unit No. 2, personnel noted that evaluations provided with the November 21, 2003, supplement were intended to show that the findings at Millstone 2 do not significantly impact the technical bases for safe operation of HBRSEP, Unit No. 2, including the deferral of non-destructive examinations (NDE) of the reactor pressure vessel (RPV) head penetrations for one operating cycle. It was recognized, however, that one aspect of the technical bases for the HBRSEP, Unit No. 2, relaxation request, pertaining to minimal observed degradation seen in plants with similar materials and manufacture, had become less compelling based on the Millstone 2 observations. That notwithstanding, HBRSEP, Unit No. 2, maintains that the previously submitted plant-specific evaluations represent substantial technical bases for the proposed relaxation and are not materially affected by the Millstone 2 observations.

As noted within the August 15, 2003, relaxation request, HBRSEP, Unit No. 2, has concluded that sufficient technical bases exists to request relaxation of the Order requirements, that good cause has been shown, and that public health and safety will not be adversely affected by the proposed one cycle deferral. The HBRSEP, Unit No. 2, RPV head is scheduled to be replaced in October 2005 during Refueling Outage 23.

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Notwithstanding the substantial technical bases for the relaxation as proposed, a revision to the proposed relaxation is being provided to address the NRC staff reviewer concerns. The attachment to this letter describes the revision to the proposed relaxation request, including the alternative to perform eddy current surface examination of the J-groove welds and the outer diameters of each RPV head penetration nozzle. The revision also proposes to address observations made by NRC staff reviewers during meetings on September 25, and October 16, 2003, pertaining to re-examination of some previous indications that were conservatively reported as craze cracking.

In addition to addressing NRC staff reviewer concerns, the proposed revision to the requested relaxation is intended to provide evidence that degradation similar to that seen at Millstone 2 is not occurring at HBRSEP, Unit No. 2. The proposed relaxation will continue to provide radiation dose savings (approximately 0.5 Rem) as compared to the projected dose associated with conducting NDE of the entirety of the RPV head penetrations as directed by the Order.

In order to effectively plan for the April 2004 refueling outage, and in recognition that the technical information supporting this relaxation request has not changed and has already been substantially reviewed by the NRC staff, it is respectfully requested that the NRC complete the review of this request by February 20, 2004.

The information contained in this letter and attachment is true and correct to the best of my information, knowledge, and belief; and the sources of my information are officers, employees, contractors, and agents of PEC. I declare under penalty of perjury that the foregoing is true and correct.

If you have any questions concerning this matter, please contact Mr. C. T. Baucom.

Sincerely,

John W. Moyer
Site Vice President

CTB/cac

Attachment

c: Mr. L. A. Reyes, NRC, Region II
Mr. C. P. Patel, NRC, NRR
NRC Resident Inspector
NRC Document Control Desk

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By letter dated August 15, 2003, Progress Energy Carolinas, Inc. (PEC), provided a request for relaxation of the subject Order in accordance with the provision of the Order that states the Director, Office of Nuclear Reactor Regulation, may, in writing, relax or rescind any of the conditions of the Order upon demonstration by the licensee of good cause. Supplemental information in support of the August 15, 2003, relaxation request was provided by letter dated November 21, 2003. In a telephone conference with NRC Nuclear Reactor Regulation personnel on Thursday, December 11, 2003, H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, representatives were informed that the indications recently found at Millstone 2 present concerns for the NRC staff reviewers.

The following revision to the proposed request for relaxation is being provided to address the NRC staff reviewer concerns, and to provide evidence that reactor pressure vessel (RPV) head degradation similar to that seen at Millstone 2 is not occurring at HBRSEP, Unit No. 2:

Proposed Alternative as Originally Submitted

Bare metal visual examination of 100% of the RPV head surface (including 360° around each RPV head penetration nozzle), except for a small percentage of surface area (approximately 1%) under the shroud support structure that is not visible, shall be conducted during the next refueling outage for HBRSEP, Unit No. 2, which is currently planned for April 2004.

Non-destructive examination (NDE) conducted in the previous refueling outage, along with analyses that demonstrate incipient failure during these two cycles of operation should not occur, are also provided as alternatives to the NDE requirements of Section IV.C.(1)(b) of the Order.

The HBRSEP, Unit No. 2, RPV head is scheduled to be replaced in October 2005, during Refueling Outage (RO)-23. If the RPV head is not replaced at that time, examination of the existing RPV head will be conducted in accordance with the Order or any applicable superseding requirement.

Revised Proposed Alternative

Bare metal visual examination of 100% of the RPV head surface (including 360° around each RPV head penetration nozzle), except for a small percentage of surface area (approximately 1%) under the shroud support structure that is not visible, shall be conducted during the next refueling outage for HBRSEP, Unit No. 2, which is currently planned for April 2004.

Eddy current examination of the J-groove welds and the wetted surface of the outside diameter (OD) of the RPV head penetrations will be conducted during the next refueling outage for HBRSEP, Unit No. 2, which is currently planned for April 2004. NDE of at least three previous locations where craze cracking was indicated will also be conducted.

The proposed eddy current examination of the J-groove weld and OD wetted surface of the RPV head penetrations, along with NDE conducted in the previous refueling outage and analyses that demonstrate incipient failure during these two cycles of operation should not occur, are provided as alternatives to the NDE requirements of Section IV.C.(1)(b) of the Order.

The HBRSEP, Unit No. 2, RPV head is scheduled to be replaced in October 2005, during Refueling Outage (RO)-23. If the RPV head is not replaced at that time, examination of the existing RPV head will be conducted in accordance with the Order or any applicable superseding requirement.

Reason for Request

Appropriate and sufficient actions have been taken and are proposed to assure the integrity of the RPV head at HBRSEP, Unit No. 2. The safety benefits derived by the performance of NDE of the RPV head penetrations in accordance with Section IV.C.(1)(b) of the Order during the next refueling outage do not outweigh the impacts that these examinations would impose. As described in the basis for this relaxation request, safe operation of HBRSEP, Unit No. 2, will continue to be assured based on the examinations that will be conducted during RO-22, along with the examinations that were completed during RO-21, and the analyses that demonstrate that incipient failure during these two cycles of operation should not occur. The proposed examination scope is expected to save approximately 0.5 rem and should not cause an increase in planned outage duration for RO-22.

Basis for the Revised Relaxation Request

The demonstration of good cause is based on the following:

> Safe operation of HBRSEP, Unit No. 2, will continue to be assured based on the proposed examinations for RO-22, examinations that have been completed in RO-21, and the analyses that demonstrate that incipient reactor coolant pressure boundary failure due to RPV head penetration failure should not occur.

Incipient reactor coolant pressure boundary failure is considered propagation of a flaw through the pressure retaining portion of the RPV head penetration nozzle or associated weld.

As originally proposed, the requested relaxation of the Order requirements was based solely on the completed examinations during RO-21 and analyses that demonstrated incipient failure should not occur during the one operating cycle of deferral. The revised alternative essentially eliminates reliance on the analyses except for flaws initiated from the inner diameter (ID) of the RPV head penetration tubes. The revised alternative will also address the primary area of

concern in the ID of the penetration tubes by re-examination of at least three locations where craze cracking had been indicated.

The information pertaining to previous examination results as previously submitted is not affected by the revised alternative. The previous examination results support the conclusion that degradation of the HBRSEP, Unit No. 2, RPV head and associated penetrations has not occurred.

The only analysis cases applicable to the revised proposed alternative are ID crack initiation and propagation above the J-groove weld, which would be the most limiting unexamined locations. As shown by the Westinghouse and Dominion Engineering analyses, ID cracks above the J-groove weld initiated from the maximum undetected flaw size are not expected to propagate through-wall within the three year period of examination deferral. The results further show that such cracks are not expected to propagate 75% through-wall within the period of deferral. For example, the following figure from the Westinghouse report WCAP-16110, shows the estimated time for crack propagation for ID axial flaws:

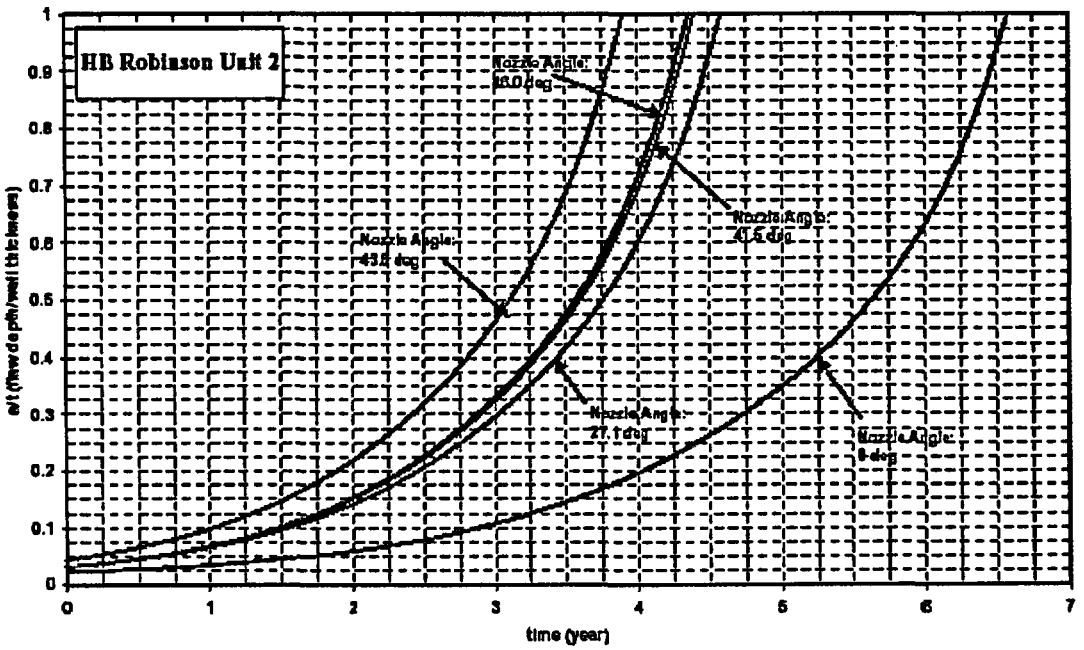

Figure 4-1 Crack Growth Predictions for Axial Inside Surface Flaws Located in the Attachment Weld Zone – Nozzle Downhill Side

Therefore, the revised proposed alternative provides adequate and substantial assurance that reactor coolant pressure boundary integrity will be maintained during the period of examination deferral, as described in this request for relaxation from the Order. This conclusion is based on the preceding information and the information provided by the previous HBRSEP, Unit No. 2, submittals dated August 15 and November 21, 2003.

Conclusion

Order EA-03-009 specifies the interim requirements for RPV head inspections. The Order was established by the NRC in response to discoveries that RPV head degradation had occurred at some nuclear power plants. The Order further states that the requirements of the Order are based on the body of evidence available through February 2003, and that continuing research and operating experience may support changes to the requirements imposed by this Order. The results of examinations completed for HBRSEP, Unit No. 2, provide additional operating experience. The submittals dated August 15 and November 21, 2003, and the reports provided in support of these submittals, provide additional operating experience and technical bases.

The revised proposed alternative to the Order, which includes examination of the OD wetted surface and J-groove welds, establishes the bases for safe operation of HBRSEP, Unit No. 2, for the period of deferral, which is one operating cycle. The revised proposed alternative also provides reduction of the impacts imposed by the Order. Specifically, the proposed alternative will accomplish the appropriate examinations with less radiation exposure and without increasing outage duration. The revised proposed alternative also directly addresses the areas of NRC staff reviewer concerns as discussed during meetings on September 25 and October 16, 2003, and in a telephone conference on December 11, 2003.

Therefore, it is hereby respectfully submitted that the Order requirements should be modified as proposed herein for HBRSEP, Unit No. 2, on the basis that good cause has been demonstrated, in accordance with Section IV.F of the Order.