CP&L
A Progress Energy Company

10 CFR 50.54(f)

Serial: RNP-RA/02-0182

DEC 1 3 2002

United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

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

SUBMITTAL OF 30-DAY RESPONSE TO NRC
BULLETIN 2002-01, "REACTOR PRESSURE VESSEL HEAD
DEGRADATION AND REACTOR COOLANT PRESSURE BOUNDARY INTEGRITY"

Ladies and Gentlemen:

Pursuant to 10 CFR 50.54(f), Carolina Power and Light Company hereby submits the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, 30-day post-outage response to NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity." Specifically, Item 2 of NRC Bulletin 2002-01 (the "Bulletin") requires the following:

"2. Within 30 days after plant restart following the next inspection of the reactor pressure vessel head to identify any degradation, all PWR addressees are required to submit to the NRC the following information:

A. the inspection scope (if different than that provided in response to Item 1.D) and results, including the location, size, and nature of any degradation detected,

B. the corrective actions taken and the root cause of the degradation."

The results of the bare-metal qualified visual examination determined that all 69 VHP nozzles were acceptable with no degradation, cracking, or leakage identified. No degradation of the RPV head was identified. Therefore, no corrective action or root cause determinations were necessary.

Attachment I to this letter provides an Affirmation in accordance with 10 CFR 50.54(f).

Attachment II to this letter provides the detailed information required by Item 2 of the Bulletin.

Robinson Nuclear Plant
3581 West Entrance Road
Hartsville, SC 29550

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The HBRSEP, Unit No. 2, 15-day response to NRC Bulletin 2002-01, Items 1.A through 1.E, was provided by letter dated April 1, 2002, and the 60-day response was provided by letter dated May 17, 2002. A request for additional information was received from the NRC by letter on December 2, 2002. Response to that request is expected to be provided within 60 days of the receipt of that letter.

If you have any questions regarding this submittal, please contact Mr. C. T. Baucom.

Sincerely,

B. L. Fletcher III
Manager – Support Services – Nuclear

CAC/cac

Attachments:

I. Affirmation
II. 30-Day Post-Outage Response to NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity"

c: Mr. L. A. Reyes, NRC, Region II
Mr. R. Subbaratnam, NRC, NRR
NRC Resident Inspector

AFFIRMATION

The information contained in letter RNP-RA/02-0182 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 Carolina Power and Light Company. I declare under penalty of perjury that the foregoing is true and correct.

Executed on: DEC 1 3 2002

C L Burton

C. L. Burton
Director – Site Operations, HBRSEP, Unit No. 2

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

30-DAY POST-OUTAGE RESPONSE TO NRC BULLETIN 2002-01, "REACTOR PRESSURE VESSEL DEGRADATION AND REACTOR COOLANT PRESSURE BOUNDARY INTEGRITY"

NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity," (the "Bulletin") Item 2, requires the following:

"2. Within 30 days after plant restart following the next inspection of the reactor pressure vessel head to identify any degradation, all PWR addressees are required to submit to the NRC the following information:

A. the inspection scope (if different than that provided in response to Item 1.D) and results, including the location, size, and nature of any degradation detected,

B. the corrective actions taken and the root cause of the degradation."

Response:

The initial H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, response to NRC Bulletin 2002-01 was provided by letter dated April 1, 2002. The specific response to Item 1.D was provided as follows:

> HBRSEP, Unit No. 2, will perform a bare-metal qualified visual examination of the VHP nozzles and RPV head during RO-21, which is scheduled to commence in October 2002. Procedures utilized for this VT-2 visual examination will be qualified, as necessary, in accordance with Section XI of the ASME B&PV Code. Observed leakage or evidence of leakage will be evaluated in accordance with the ASME B&PV Code and associated HBRSEP, Unit No. 2, pressure testing and boric acid program procedures. If boric acid deposition is identified, either from reactor coolant pressure boundary leakage between the VHP nozzles and the vessel head or from any other source above the RPV head (e.g., CRDM canopy seal weld leakage), the results will be documented and the deposition removed. Should material degradation result from such deposition, the scope and extent of degradation will be evaluated and appropriate actions for repairs will be implemented.
>
> Inspection of the RPV head during RO-21 will include ultrasonic testing (UT) of VHP nozzles. The UT techniques that will be employed will be demonstrated in accordance with the Electric Power Research Institute (EPRI) Materials Reliability Program (MRP) protocol. The acceptance criteria for evaluation of recorded UT indications will be established by fracture mechanics analysis. If

leakage is identified around the RPV head nozzle penetration and the nozzle is found to be acceptable based upon UT results, then additional examinations will be performed to the extent necessary to determine the source of leakage.

The above-described examination activity may be modified, as appropriate, to reflect industry experience and lessons-learned that may become available during planning for RO-21. This includes the results of reviews and analyses associated with RPV head degradation identified at Davis-Besse.

HBRSEP, Unit No. 2, intends to perform appropriate inspections of the RPV head and VHP nozzles during refueling outages subsequent to RO-21. The nature, scope, and techniques associated with these future inspections will be based on RO-21 inspection results, and industry experience and lessons learned between RO-21 and future refueling outages. The RO-21 inspection results may also be used to assess the potential benefits that could be attained by replacement of the HBRSEP, Unit No. 2, reactor vessel head.

Details of the non-visual examinations (UT and Eddy Current inspections) performed on the VHP nozzles during RO-21 are being provided in the 30-day post-outage response to NRC Bulletins 2001-01 and 2002-02.

The visual examination of the reactor pressure vessel head was conducted in accordance with HBRSEP, Unit No. 2, procedure SP-1500, "Visual Examination of RPV Head Penetration Nozzles." The examinations were performed on October 20 and 21, 2002, by personnel qualified to perform VT-2 Level II or greater. The required reviews of the examination results were completed on October 29, 2002.

The results of the bare-metal qualified visual examination determined that all 69 VHP nozzles were acceptable with no degradation, cracking, or leakage identified. No degradation of the RPV head was identified. Therefore, no corrective action or root cause determinations were necessary. Figure 1 provides a diagram of the Reactor Pressure Vessel Head Penetration locations.

To perform the examination, the plant equipment was placed in a condition that allowed access to the entire top surface of the RPV head and 360 degrees of each penetration with the RPV head insulation removed. SP-1500 instructs that during removal of insulation and/or debris to facilitate the examination, caution must be taken to not wipe off, smear, or disturb any boric acid deposits that may be present on the RPV head without first determining their source and relevance. A systematic approach, including the use of detail drawings, was used to ensure that the region of interest surrounding each penetration was inspected for 360 degrees of its circumference. Each penetration-to-head interface (annulus) was closely scrutinized to determine if boric acid deposits were present in, or around, the penetration annulus. Penetrations were visually accepted based on the absence of boric acid deposits in the annulus area and the results documented in SP-1500.

As stated in the April 1, 2002 letter, procedures utilized for this VT-2 visual examination were qualified, as necessary, in accordance with Section XI of the ASME B&PV Code. Procedure SP-1500 specifically stated that optical aids utilized must be demonstrated to resolve selected 0.044 inches tall VT-1 test chart characters (IWA-2210-1) at a distance of no more than one foot,

and should also demonstrate the capacity to differentiate colors. This step must be repeated when equipment is changed or after any malfunction that may affect the performance of the examination system.

Additionally, the personnel performing the inspection reviewed the latest revision of Electric Power Research Institute (EPRI) Report 1006296, "Visual Examination For Leakage of PWR Reactor Head Penetrations on Top of RPV Head," and the inspection personnel also reviewed up-to-date leakage characterization and exam methodology.

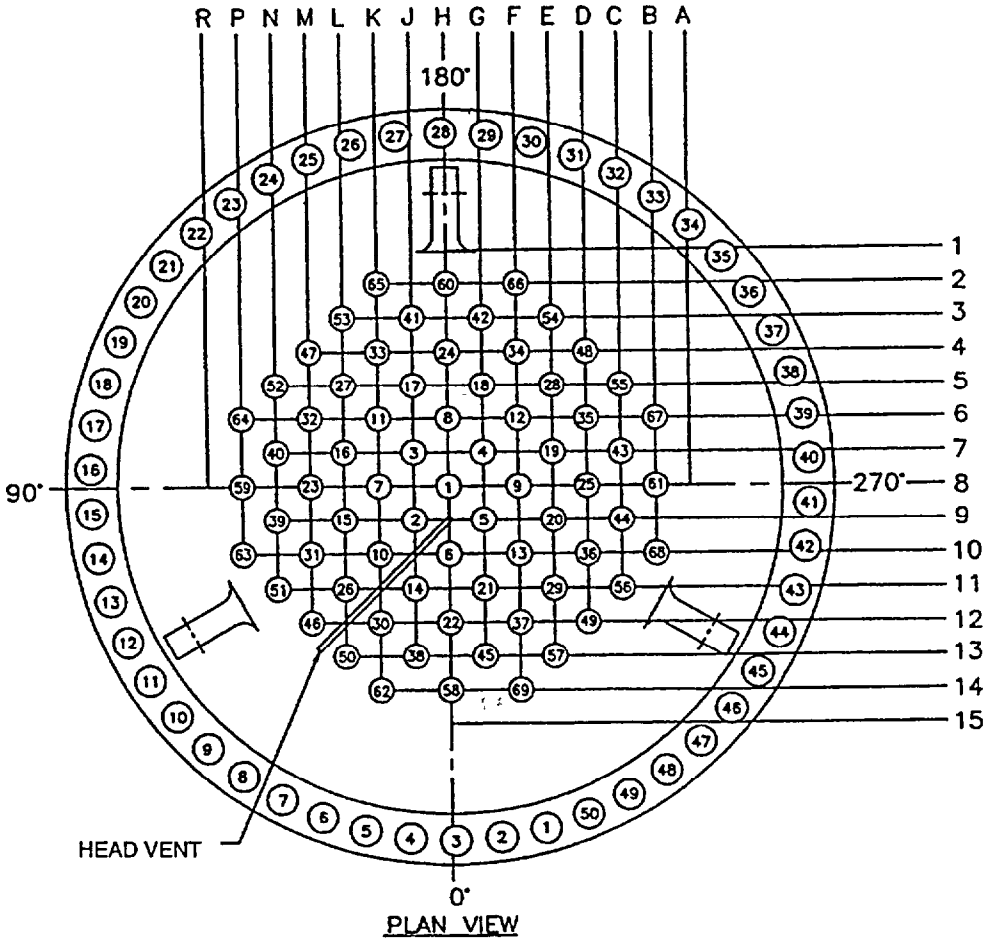
During the initial examination, small amounts of dry boric acid residue were identified at the intersection of the VHP nozzle and RPV head near 12 penetrations (penetration numbers 26, 30, 31, 36, 38, 39, 46, 50, 51, 58, 62, and 63). This residue was initially considered to be masking some areas of inspection interest. The residue was easily removed by vacuuming, in accordance with SP-1500 and EPRI guideline recommendations, and determined to be from a source other than the penetration annuli. Re-examination after vacuuming, which eliminated the masking conditions, found no evidence of penetration leakage and concluded that the penetrations were acceptable.

Procedure SP-1500 provides additional guidance for the masking that was observed. SP-1500 states that the presence of boric acid from other sources or debris may mask leakage conditions associated with RPV head penetration nozzle cracking, and that if such masking is evident, indicate the origin of existing deposits masking the examination area. The source of boric acid residue was determined to be canopy seal weld leakage above the penetrations. (The canopy seal welds are not a structural part of the reactor coolant pressure boundary.) The dry boric acid residue from the canopy seal weld leakage had fallen from the RPV head insulation onto the RPV head surface during insulation removal.

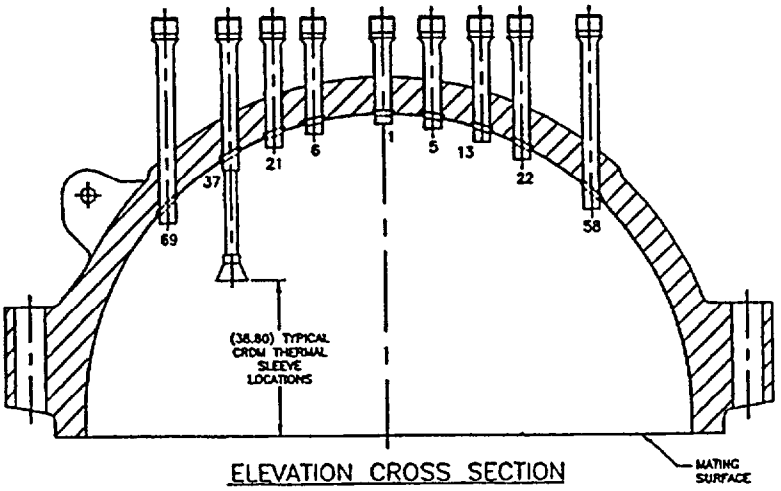
Corrective actions to repair four canopy seal welds were completed. The canopy seal welds on penetrations 10, 14, and 30 were repaired by welding. An ASME Code relief request (RR-18) was submitted by letter dated November 5, 2002, and NRC approval of the repair for these three penetrations was provided in a letter dated November 26, 2002. The Penetration 50 canopy seal weld was repaired using a clamp assembly. The canopy seal weld leakage did not cause degradation of the RPV head or the VHP nozzles.

In conclusion, HBRSEP, Unit No. 2, conducted a bare-metal qualified visual examination of the RPV head that determined the 69 VHP nozzles were acceptable with no degradation, cracking, or leakage identified, and no degradation of the RPV head was identified.

FIGURE 1. HBRSEP, UNIT NO. 2, REACTOR PRESSURE VESSEL HEAD PENETRATIONS



PLAN VIEW



ELEVATION CROSS SECTION

NOTE: PENETRATIONS DEPICTED IN CROSS SECTION ARE REPRESENTATIVE OF DIFFERENT RADIAL LOCATIONS