VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

January 18, 2005

10 CFR 50.54(f)

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
11555 Rockville Pike
Rockville, Maryland 20852

Serial No. 03-459F
SPS/GDM R0
Docket No. 50-280
License No. DPR-32

VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
SURRY POWER STATION UNIT 1
SIXTY-DAY RESPONSE TO NRC BULLETIN 2003-02
LEAKAGE FROM REACTOR PRESSURE VESSEL LOWER HEAD PENETRATIONS AND REACTOR COOLANT PRESSURE BOUNDARY INTEGRITY

On August 21, 2003 the NRC issued NRC Bulletin 2003-02, "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity." The bulletin requested licensees to provide a description of their reactor pressure vessel (RPV) lower head penetration inspection programs that they have previously implemented at their plants, as well as a description of the RPV lower head penetration inspection programs that they will be implementing during the next and subsequent refueling outages. This information was provided for Surry Units 1 and 2 in a letter dated September 22, 2003 (Serial No. 03-459).

The bulletin also requested that a summary of the inspection results be submitted to the NRC within 60 days of plant restart following the next inspection of the RPV lower head penetrations. The report is to include the inspections performed, the extent of the inspections, the methods used, a description of the as-found condition of the lower head, any findings of relevant indications of through-wall leakage, and a summary of the disposition of any findings of boric acid deposits and any corrective actions taken as a result of indications found. Dominion performed the requested inspection of the Surry Unit 1 RPV lower head penetrations during the fall 2004 refueling outage that was completed on December 3, 2004. The requested 60-day response documenting the inspection is provided in Attachment 1.

Inspections of the inside surface of the Surry Unit 1 RPV lower head nozzle penetrations were also performed to the extent possible from inside the reactor vessel. The results of this examination effort are provided in Attachment 2.

If you have any questions or require additional information, please contact Mr. Gary D. Miller at (804) 273-2771.

Very truly yours,

L. N. Hartz
Vice President – Nuclear Engineering

Attachments

Commitments made in this letter: None

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Serial No. 03-459F
Docket No. 50-280

Surry Power Station Unit 1
Sixty-Day Response To NRC Bulletin 2003-02
Leakage From Reactor Pressure Vessel Lower Head Penetrations And
Reactor Coolant Pressure Boundary Integrity

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Leslie N. Hartz, who is Vice President - Nuclear Engineering of Virginia Electric & Power Company. She has affirmed before me that she is duly authorized to execute and file the foregoing document in behalf of those companies, and that the statements in the document are true to the best of her knowledge and belief.

Acknowledged before me this 18TH day of January, 2005.

My Commission Expires: May 31, 2006.

Vicki L. Hull
Notary Public

(SEAL)

ATTACHMENT 1

Serial No. 03-459F

Sixty-Day Response to NRC Bulletin 2003-02
Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity

Surry Power Station Unit 1

Virginia Electric and Power Company
(Dominion)

Sixty-Day Response to NRC Bulletin 2003-02
Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity
Surry Power Station Unit 1

On August 21, 2003 the NRC issued Bulletin 2003-02, "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity." The bulletin requested licensees to provide information related to inspections that have been performed to verify the integrity of the reactor pressure vessel (RPV) lower head bottom-mounted instrumentation (BMI) penetration nozzles within sixty-days of the completion of the outage in which the inspections were completed. The sixty-day response for Surry Power Station Unit 1 is provided below.

Requested Information

Within 60 days of plant restart following the next inspection of the RPV lower head penetrations, subject PWR addressees should submit to the NRC a summary of the inspections performed, the extent of the inspections, the methods used, a description of the as-found condition of the lower head, any findings of relevant indications of through-wall leakage, and a summary of the disposition of any findings of boric acid deposits and any corrective actions taken as a result of indications found.

Response

Engineering Surveillance Procedure 0-NSP-RC-003, "Visual Examination of Reactor Pressure Vessel Bottom Mounted Instrumentation (BMI)," was performed on the RPV lower head to inspect for any potential boric acid leakage from the bottom-mounted instrumentation nozzles. An as-found inspection of the outside of the RPV lower head insulation was performed for any evidence of boric acid leakage prior to the removal of any insulation. No evidence of leakage was discovered on the outside of the insulation.

Following the as-found insulation inspection, the center panel of the lower head insulation (approximately seven feet in diameter) was unfastened from the remaining insulation and lowered to the support structure to permit access to the majority of the bottom-mounted instrumentation nozzles. The remaining nozzles that could not be accessed by removing the center insulation panel were accessed by removing insulation locally. The nozzle inspections were performed by a VT-2 Level II certified individual by either direct visual inspection or by visual inspection aided by the use of mirrors. Where camera access was possible, digital photography was used to record the inspection. A 360-degree bare-metal visual examination of the 50 bottom-mounted instrumentation penetration nozzles was performed with no evidence of leakage observed. The bottom of the vessel was also inspected for contour changes, which could be indicative of wastage, by adjusting light angles and observing the curvature and contour of the bottom head. No areas of wastage were observed.

Following refueling activities, the bottom of the vessel was cleaned to remove any boric acid residue that remained from reactor cavity seal leakage, and an as-left inspection was performed prior to insulation being replaced. This inspection was to ensure that there was no boric acid residue remaining on the vessel bottom in the area of the instrumentation nozzles.

In summary, no boric acid deposits or evidence of leakage were observed for any of the bottom-mounted instrumentation nozzles, nor was any evidence of head wastage observed. Consequently, no corrective actions were required.

ATTACHMENT 2

Serial No. 03-459F

Results of the Reactor Pressure Vessel (RPV) Lower Head Penetration Inspections (Performed from Inside the RPV)

Surry Power Station Unit 1

Virginia Electric and Power Company
(Dominion)

Results of the Reactor Pressure Vessel Lower Head Penetration Inspections Performed Inside the Vessel

Surry Power Station Unit 1

Examinations from the inside surface of the bottom mounted instrumentation (BMI) penetration nozzles were performed at Surry Unit 1 during the fall 2004 refueling outage. The examinations were performed by Wesdyne International (a subsidiary of Westinghouse) using the following demonstrated procedures:

a) WDI-STD-133, Revision 2 – "Paragon Eddy Current Procedure for the Inspection of Reactor Vessel Bottom Mounted Instrumentation Tube Penetrations"

b) WDI-STD-134, Revision 2 – "Paragon Ultrasonic Procedure for the Inspection of Reactor Vessel Bottom Mounted Instrumentation Tube Penetrations"

c) WDI-STD-141, Revision 2, - "Bottom Mounted Instrumentation UT Analysis Guidelines for Use with Paragon"

d) WDI-STD-142, Revision 2, - "Paragon Eddy Current Analysis Guidelines for Inspection of Reactor Vessel Bottom Mounted Instrumentation Tube Penetrations"

e) WDI-STD-147, Revision 0 – "Visual Examination of BMI Tubes"

Inspection Plan

The initial inspection plan was to perform Eddy Current (ET) and Ultrasonic (UT) examinations of all 50 of the BMI nozzles from two inches above the weld toe to two inches below the weld root from the inside surface of the nozzle penetration. An enhanced VT-1 inspection (1-mil wire resolution) was also planned. However, due to equipment problems and access restrictions, only certain examinations could be performed. A summary of the inspection results is provided below.

Inspection Results

An ET and UT examination of 39 of the 50 nozzles was performed. Nine other nozzles (Penetration Nos. 14, 21, 23, 34, 36, 37, 38, 40, and 44) were examined with ET only due to the failure of the UT probe after the first 39 nozzles were examined. Two nozzles (Penetration Nos. 48 and 50) were not examined due to equipment limitations, which restricted access to the nozzles with the examination probe. The enhanced visual examination was also not performed due to water clarity issues and the inability to achieve the necessary distance and angle to obtain the required resolution. However, a general visual examination of the weld surface was performed to determine the surface condition to support future examinations.

The ET techniques consisted of using a cross wound probe designed to detect and characterize both axial and circumferential surface connected indications. The primary frequency of the probe for data analysis was 400 KHz. The UT techniques consisted of axially and circumferentially oriented time of flight diffraction (TOFD) probes, an axially oriented 45° shear wave probe, and a 0° probe used to profile the weld.

The results of the ET examinations recorded no flaw-like responses for the forty-eight penetration nozzles examined. One indication was recorded in Penetration No. 49 that was representative of a shallow surface depression. This indication is located on the nozzle tube inside surface above the weld toe and contains no crack-like characteristics. The UT examination of this nozzle confirmed this indication as a surface condition with no crack-like characteristics.

The results of the UT examinations recorded no crack-like indications in the thirty-nine nozzles examined. Two of the nozzles (Penetration Nos. 7 and 22) had fabrication indications, which were recorded on the data sheet. These indications were located at the nozzle to weld interface and were not connected to the wetted surface. Furthermore, these indications were less than the recordable fabrication indication size as detailed in the examination procedure; however, they were recorded to document the condition of the nozzle to weld interface for comparison purposes during future examinations.