Palo Verde Nuclear
Generating Station

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10 CFR 50.54(f)
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April 03, 2002

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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11555 Rockville Pike
Rockville, MD. 20852

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Docket Nos. STN 50-528/529/530
Response to NRC Bulletin 2002-01, Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity

In accordance with 10 CFR 50.54(f), the attached enclosure contains the Arizona Public Service Company (APS) response to U.S. Nuclear Regulatory Commission (NRC) Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity," dated March 18, 2002. APS coordinated preparation of this response with the other participants in the Strategic Teaming and Resource Sharing (STARS) alliance.

The following commitments are being made to the NRC in this letter:

1. APS will provide the information requested by NRC Bulletin 2002-01, Items 2.A and 2.B within 30 days after plant restart following the next inspection of the reactor pressure vessel head conducted to identify any degradation.

2. APS will provide the information requested by NRC Bulletin 2002-01, Item 3.A within 60 days of the date of the bulletin.

A095

Should you have any questions, please contact Thomas N. Weber at (623) 393-5764.

Sincerely,

GRO/SAB/RJR/

Enclosure: APS' Response to NRC Bulletin 2002-01, Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity

cc:	E. W. Merschoff	(NRC Region IV)
	J. N. Donohew	(NRR Project Manager)
	J. H. Moorman	(NRC Resident Inspector)

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, Gregg R. Overbeck, represent that I am Senior Vice President – Nuclear, that the foregoing document has been signed by me on behalf of Arizona Public Service Company with full authority to do so, and that to the best of my knowledge and belief, the statements made therein are true and correct.

Gregg R. Overbeck
Gregg R. Overbeck

Sworn To Before Me This 3rd Day Of April, 2002.

Nora E. Meador
Notary Public

"OFFICIAL SEAL"
Nora E. Meador
Notary Public-Arizona
Maricopa County
My Commission Expires 4/6/2003

Notary Commission Stamp

ENCLOSURE

APS' Response to NRC Bulletin 2002-01, Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity

APS' Response to NRC Bulletin 2002-01
Reactor Pressure Vessel Head Degradation and
Reactor Coolant Pressure Boundary Integrity

This is the Arizona Public Service Company (APS) response to Nuclear Regulatory Commission (NRC) Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity," dated March 18, 2002.

Bulletin 2002-01 requires all PWR addressees to provide the information below by April 3, 2002.

NRC Required Information

1\. A. Provide a summary of the reactor pressure vessel head inspection and maintenance programs that have been implemented at your plant.

APS Response

The following reactor pressure vessel head inspection and maintenance programs are being used at the Palo Verde Nuclear Generating Station (PVNGS) for Units 1, 2, and 3:

- Boric Acid Corrosion Prevention Program - A comprehensive program for the identification of boric acid leaks to prevent boric acid corrosion of reactor pressure boundary components in accordance with the requirements of NRC Generic Letter No. 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants." The portion of this program that addresses the reactor pressure vessel head (RPVH) is described below.

- Visual Examination for Leakage - ASME Code, Section XI visual examinations for leakage for all pressure boundary components as required by the ASME Code and the PVNGS Inservice Inspection (ISI) Program. The portion of this program that addresses the RPVH is described below.

- NRC Bulletin 2001-01 Nozzle Inspections - This inspection is an NDE program using surface and/or volumetric examinations to determine the structural integrity of the RPVH nozzles and j-welds.

These programs do not require a 100 percent bare metal inspection of the Reactor Pressure Vessel Head (RPVH). Furthermore, APS has not performed a 100 percent total top of the head bare metal inspection on any PVNGS unit. However, APS has removed a portion of the head insulation in Unit 2 as the result of performing a boric acid walkdown at the start of the March 2002 refueling outage. The details of this inspection are included in the response to Item 1.C. In addition, APS removed the insulation surrounding twenty-four RPVH Control Element Drive Mechanisms (CEDM) nozzles and the reactor head vent nozzle in the current Unit 2 outage in support of the inspections described in Item 1.D, finding no evidence of boric acid or leakage during visual examination.

Description of APS' PVNGS Boric Acid Corrosion Prevention Program

The Boric Acid Corrosion Prevention Program provides the guidelines for the identification of boric acid leaks to prevent boric acid corrosion of carbon steel reactor pressure boundary components. The procedure implements the requirements of NRC Generic Letter No. 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants." The inspection requirements outlined in this procedure ensure that boric acid corrosion does not lead to degradation of the Reactor Coolant System (RCS) pressure boundary components. Stringent implementation of the program ensures that the PVNGS Units will continue to have a very low probability of abnormal leakage, rapidly propagating failure, or gross rupture of their respective RCS pressure boundaries.

Qualified Engineering personnel perform these inspections during each refueling outage. These inspections typically takes two to three shifts. During the performance of the boric acid walkdown the visible surfaces of the following reactor vessel head appurtenances are specifically inspected for visual evidence of boric acid leakage:

1. Top of CEDM vents
2. Reactor Vessel Level Monitoring System Connections
3. Reactor Vessel Flange Area
4. CEDM Nozzles (above the insulation)
5. Head Vent isolation valve, RCEV212

The appurtenances listed above were selected for inspection based on the experience gained from previous years of developing, performing and evaluating boric acid walkdowns at PVNGS in conjunction with relevant industry operating experience. These five items represent the sources of borated water above the head that can reach the top of the RPVH from leaks. When RCS coolant leaks are identified, this procedure requires the potential path(s) of the leaking coolant to be established. It also requires identification and evaluation of any RCS pressure boundary components contacted by the leaking coolant and appropriate corrective actions.

In addition, limited inspections are performed any time a unit will be in Mode 3 and has been in power operation for more than three months or 90 effective full power days (EFPD) since the last inspection. The program also requires either a limited or complete inspection during any shutdown if containment atmosphere particulate radioactivity monitors, containment atmosphere gaseous radioactivity monitors, containment relative humidity readings, containment sump level or RCS water inventory balance measurements provide evidence of potential reactor coolant system leakage.

Description of APS' PVNGS Program for Visual Examination for Leakage

The PVNGS Inservice Inspection (ISI) Examination Program satisfies the applicable requirements identified in the PVNGS Technical Requirements Manual, 10 CFR 50.55a, and Section XI of the ASME Code (1992 Edition, 1992 Addenda). Part of this program includes the performance of visual examinations for RCS pressure boundary leakage prior to returning the unit to service thus ensuring entry into power operation with no known visual leaks.

ASME Class 1 components, including the RPVH, receive a VT-2 visual examination as part of this program. VT-2 examinations of the head are conducted when the unit is in Mode 3 (hot standby) on all portions of the RPVH that are accessible. The vessel head insulation is a close-fitting type and not designed to be routinely removed. A description of the PVNGS insulation configuration, including vendor drawings, was provided in Reference 1. This configuration limits the RPVH portion of the inspection to the visible component surfaces above the head insulation.

Visual examinations are directed to the detection of any abnormal condition such as evidence of leakage from the pressure retaining components, evidence of abnormal leakage from components that have leakage collection systems, and the presence of boric acid residues. Personnel who perform ISI examinations are qualified in accordance with the requirements of ASME Section XI.

NRC Bulletin 2001-01 Nozzle Inspections

APS is currently performing under-the-head volumetric examinations in Unit 2 Refueling Outage 10 (U2R10) as identified in APS' response to NRC Bulletin 2001-01, "Circumferential Cracking Of Reactor Pressure Vessel Head Penetration Nozzles." The examination has been modified to address Bulletin 2002-01 issues and provide further assurance of RPVH integrity. This inspection method and plan are described in the response to question 1.D. The results of this inspection will be provided in the required 30-day response following plant restart.

NRC Required Information

1. B. Provide an evaluation of the ability of your inspection and maintenance programs to identify degradation of the reactor pressure vessel head including, thinning, pitting, or other forms of degradation such as the degradation of the reactor pressure vessel head observed at Davis-Besse.

APS Response

APS has evaluated the PVNGS inspection and maintenance programs identified in the response to Item 1.A and the ability to identify degradation of the RPVH as discussed in this bulletin through the implementation of these inspections and programs. The following discussion provides a summary of APS' evaluation of the programs identified in Item 1.A.

In reviewing the events discussed in NRC Bulletin 2002-01 as available through the NRC website on reactor vessel head degradation, it appears that the sources of boron that caused the degradation were CEDM flange leakage and CEDM nozzle leakage. Per a FirstEnergy letter (Reference 3) regarding probable cause summary report, causal factors identified included CEDM flange leakage, possible CEDM nozzle leakage for 2 to 4 years, and not recognizing the potential for significant corrosion degradation as a result of boric acid accumulation and local leakage.

APS inspects all joints of the head penetrations visible above the insulation. Leakage identified from any of these joints would cause the source, the resultant path, and any boric acid residue to be investigated, evaluated and cleaned as required. This would include the removal of insulation if required to assess the impact on the RPVH. To date, there has been one actual case and one possible case of boric acid coming in contact with a RPVH at PVNGS (see response to 1.C).

APS is very confident that the Palo Verde Boric Acid Corrosion Prevention and the Section XI Visual Examination programs identified in Item 1.A would be successful at locating and identifying degradation of the RPVH when caused by above the head leakage.

To address the potential for boric acid degradation from RPVH nozzle cracking, APS' response to NRC Bulletin 2001-01 (Reference 1) and its supplements (dated December 6, 2001, January 29, 2002, and March 15, 2002), committed to performing a 100 percent inspection of the RPVH penetrations using either an effective visual examination, or under the head surface and/or volumetric examinations using a combination of eddy current, liquid penetrant, and ultrasonic examination techniques.

The volumetric examinations of the RPVH currently being performed at PVNGS in Unit 2 in response to NRC Bulletin 2001-01 were modified to specifically address the concerns of NRC Bulletin 2002-01 (see response to Item 1.D). APS' response to NRC Bulletin 2001-01 included the use of volumetric examinations because APS is confident that this inspection method would provide the most accurate indication of degraded structural integrity of a CEDM nozzle and j-weld, therefore providing a definitive basis for effecting adequate repairs. The final inspection results from Unit 2 will be included in the required 30-day response after plant restart.

APS is confident that these programs collectively would identify degradation of the

RPVH including, thinning, pitting, or other forms of degradation such as the degradation of the reactor pressure vessel head observed at Davis-Besse.

NRC Required Information

1. C. Provide a description of any conditions identified (chemical deposits, head degradation) through the inspection and maintenance programs described in 1.A that could have led to degradation and the corrective actions taken to address such conditions.

APS Response

There have been no conditions identified during the ASME Code Section XI visual examinations that could have lead to degradation of the RPVH. The Boric Acid Corrosion Prevention Program identified one leak where boric acid accumulation on the RPVH insulation was noted. One other possible case was identified that involved the potential exposure of the RPVH to boric acid. These are detailed below. Other instances of leakage found during refueling outage inspections has been minor and are described in Table 1.

- Unit 2 Reactor Vessel Level Monitoring System Connections (RVLMS) - This condition was an active leak. It was identified during boric acid corrosion prevention program inspections conducted at the start of the current refueling outage (U2R10 March 2002) and documented in the corrective action program. There was evidence of boric acid accumulation on the insulation collar for the RVLMS nozzle. There was evidence that the boric acid went through the insulation onto the head beneath the reflective insulation. There was also evidence of boric acid accumulation below the lift rig skirt onto the top of the flange surrounding several of the vessel closure studs/nuts. Additional inspections were performed after cleaning the flange area in support of de-tensioning and removal of the closure studs and nuts. The area of the flange on which the borated water had pooled exhibited only minor cosmetic corrosion. For all other bare metal that had been exposed to boric acid accumulation, only minor staining occurred. There was no damage to the studs. The collar around CEDM #96 was removed and remote visual inspections identified boric acid residue on the RPVH below the nozzle was noted. The area around CEDM #96 under the insulation was then cleaned and re-inspected. The re-inspection showed no signs of RPVH degradation.

- Unit 3 - Containment Spray Actuation – This event caused a short notice outage in June of 1991. No appreciable water was noted on the reactor vessel insulation. There was no direct path to the reactor head from the containment spray nozzles. Leakage on to the head would have been through tertiary paths. An engineering evaluation determined that there was no impact on the continued operation of the reactor vessel. This event was reported to the NRC in LER 3-91-003-01.

NRC Required Information

1. D. Provide your schedule, plans, and basis for future inspections of the reactor pressure vessel head and penetration nozzles. This should include the inspection method(s), scope, frequency, qualification requirements, and acceptance criteria.

APS Response

PVNGS consists of three Combustion Engineering "System 80" Nuclear Steam Supply Systems. Each of the units is on an 18-month refueling cycle. As such, there are spring and fall outages each year. Unit 2 is currently in a refueling outage. The next outage for Unit 1 is scheduled for the fall of 2002 and for Unit 3 is scheduled for the spring of 2003.

APS' current commitment for inspections in response to NRC Bulletin 2001-01 is to perform the inspections associated with Bulletin 2001-01 during the current Unit 2 refueling outage. Inspection plans for Units 1 and 3 will be determined following the completion of the Unit 2 inspection and assessment of the inspection results. In response to this bulletin (2002-01), APS modified the Unit 2 inspection plan (discussed below) to accommodate additional tooling and inspections to address RPVH degradation.

Bulletin 2001-01 Under-the-Head Volumetric Examination of the CEDM nozzles.

These examinations are being performed using specialized robotic equipment and examination techniques. This equipment has been developed to perform the examinations and would also be used to perform any needed repairs and/or mitigation techniques as well.

The planned inspections use remote tooling with a combination of surface eddy current (ET) and volumetric techniques for inspecting 97 CEDM nozzles. The ET scans will be applied from the inside diameter (ID) of the nozzle using Westinghouse's open probe scanner. Ultrasonic testing (UT) will also be applied from the ID with the same scanner. The ET and UT scans will be performed at the same time and will provide the capability of examining the ID and outside diameter (OD) nozzle wall. The scan area includes all wetted surfaces of the nozzle below the j-weld and up to approximately two (2) inches above the j-weld.

The under-the-head examinations have been qualified by Westinghouse to have the capability to reliably detect significant cracking. The Westinghouse non-destructive examination (NDE) techniques have been qualified using the Entergy/EPRI nozzle mock-up. The examinations under the head include two transducers (zero degree) with different gain settings to capture near surface and j-weld crack indications. The method of qualification and the acceptance criteria for the under head examination techniques have been developed by Westinghouse and approved by APS.

The reactor head vent in Unit 2 was inspected by visual examination and found acceptable. APS also removed insulation surrounding an additional twenty-four RPVH Control Element Drive Mechanisms (CEDM) nozzles, performed a visual inspection, and found these nozzles acceptable.

Bulletin 2001-01 Inspection Modifications to Address Bulletin 2002-01

In response to Bulletin 2002-01, the following additional activities were added to the Bulletin 2001-01 inspection plan to address actions to be taken in the event potential or through-wall crack indications are identified in the nozzle at or above the j-weld area:

1. Full length UT of the nozzle OD to assess nozzle OD cracking

2. Low Frequency ET to assess potential bore corrosion

3. Top of head visual examination for leakage if the bore assessment using ET indicates degradation of the annulus.

Indications in the j-weld, or potential indications will result in the j-weld being surface ET examined using the Westinghouse "grooveman" tool or confirmed by additional ultrasonic testing. This will allow confirmation of any crack defect. If there is no confirmation of a linear defect, then the weld is considered acceptable. If there is a confirmed linear defect, then further examination is required before repairs may commence. The further examinations include:

1. Full length UT of the nozzle OD to assess nozzle OD cracking

2. Low Frequency ET to assess potential bore corrosion

3. Top of head visual examination for leakage if the bore assessment using ET indicates degradation of the annulus.

Weld cracks are not planned for excavation for depth sizing. APS will assume through-wall extension and will perform additional NDE to assess potential damage to the nozzle OD and to the bore. APS Engineering personnel have the final approval of all NDE data and repair recommendations associated with the reactor vessel head penetration examinations.

Partial through-wall cracks found in the nozzles will either be repaired or left as-is for a determined service life based on a flaw tolerance approach. The approach is based on the prediction of future growth to ensure that such flaws will remain stable. The EPRI-MRP Crack Growth Rate model curve for PWSCC of Alloy 600 material is used to determine a conservative service life prior to repair.

APS will finalize the examination schedule for Units 1 and 3 based on the inspection results from Unit 2.

NRC Required Information

1. E. Provide your conclusion regarding whether there is reasonable assurance that regulatory requirements are currently being met. This discussion should also explain your basis for concluding that the inspections discussed in response to Item 1.D will provide reasonable assurance that these regulatory requirements will continue to be met. Include the following specific information in this discussion:

   (1) If your evaluation does not support the conclusion that there is reasonable assurance that regulatory requirements are being met, discuss your plans for plant shutdown and inspection.

APS Response

APS' response supports the conclusion that there is reasonable assurance that regulatory requirements are being met as identified in 1. E (2) below.

NRC Required Information

   (2) If your evaluation supports the conclusion that there is reasonable assurance that regulatory requirements are being met, provide your basis for concluding that all regulatory requirements discussed in the Applicable Regulatory Requirements section will continue to be met until the inspections are performed.

APS Response

As described in the Applicable Regulatory Requirements section of Bulletin 2002-01, several provisions of the NRC regulations pertain to the issue of reactor head degradation and RPVH nozzle cracking. These include the general design criteria, 10 CFR 50.55a, quality assurance criteria, and the plant Technical Specifications. PVNGS has effectively implemented comprehensive and aggressive inspection programs which contain all inspections required by these regulations as well as those required by the ASME Code and APS' regulatory commitments. APS' approach is consistent with the MRP justification (Reference 2) and provides reasonable assurance that regulatory requirements are being met. Normal plant inspections will continue during the applicable plant conditions (e. g., scheduled refuelings, unanticipated short notice outages, etc) as discussed in the response to Bulletin Item 1.A.

The basis for concluding that all regulatory requirements are being met is provided below.

The applicable regulatory requirements addressed are as follows:

- Appendix A to 10 CFR Part 50, "General Design Criteria for Nuclear Power Plants"

  GDC 14 – "Reactor Coolant Pressure Boundary"
  GDC 31 – "Fracture Prevention of Reactor Coolant Pressure Boundary, and"
  GDC 32 – "Inspection of Reactor Coolant Pressure Boundary"

- Plant Technical Specifications

- 10 CFR 50.55a, Codes and Standards, which incorporates by reference Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components, of the ASME Boiler and Pressure Vessel Code"

- Appendix B of 10 CFR Part 50, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," Criteria V, IX, and XVI

- NRC Generic Letter 88-05

General Design Criteria (GDC):

GDC 14 specifies that the reactor coolant pressure boundary (RCPB) has an extremely low probability of abnormal leakage, of rapidly propagating failure, and of gross rupture. GDC 31 specifies that the probability of rapidly propagating fracture of the RCPB be minimized. GDC 32 specifies that components that are part of the RCPB have the capability of being periodically inspected to assess their structural and leak-tight integrity; inspection practices that do not permit reliable detection of degradation are not consistent with this GDC.

As part of the original design and licensing of PVNGS, APS demonstrated that the design of the RCPB met these requirements. PVNGS complied with these criteria in part by: 1) selecting Alloy 600 and other austenitic materials with excellent corrosion resistance and extremely high fracture toughness for reactor coolant pressure boundary materials; and 2) following ASME Codes and Standards and other applicable requirements for fabrication, erection, and testing of the pressure boundary parts. These requirements established for design, fracture toughness, and inspectability in GDC 14, 31, and 32, respectively, were satisfied during the initial design and licensing, and continue to be satisfied during operation.

The industry has recognized for some time the susceptibility of Alloy 600 to Primary Water Stress Corrosion Cracking (PWSCC). Additional inspection activities have been implemented to address this issue up to and including the current inspection activities associated with NRC Bulletin 2001-01. Alloy 600 degradation is one source of leakage that could lead to boric acid corrosion of the RCPB. With proper inspection and corrective action in accordance with Alloy 600 and boric acid corrosion prevention programs, continued compliance with the GDC noted above could be achieved. Therefore, in view of the inspection programs and activities described throughout this response to NRC Bulletin 2002-01, there is reasonable assurance that these regulatory requirements are being met.

Plant Technical Specifications:

The limits for PVNGS RCPB leakage are provided in Technical Specification 3.4.14, "RCS Operational Leakage," and are stated in terms of the amount of leakage (i.e., 1 gallon per minute for unidentified leakage; 10 gpm for identified leakage; and no leakage in the reactor coolant system pressure boundary). Routine surveillance testing is required to ensure these requirements are met. Based on industry experience, most leaks from reactor coolant system Alloy 600 penetrations have been well below the sensitivity of on-line leakage detection systems. However, if leakage or unacceptable indications are identified, defects will be identified and repaired before startup. If measurable leakage is detected by the on-line leak detection systems, the leak will be evaluated per the Technical Specifications, and the plant will be shut down if required. Upon detection and identification of a leak, corrective actions will be taken to restore RCPB integrity. APS continues to meet the requirements of this Technical Specification.

Inspection Requirements (10 CFR 50.55a and ASME Section XI):

NRC regulations in 10 CFR 50.55a require that the RCPB meet the requirements of Section XI of the ASME Boiler and Pressure Vessel Code. Section XI requires inspection and corrective actions for RCPB degradation. APS complies with these requirements. In addition, inspections beyond those required by Section XI have been implemented to address issues associated with Alloy 600 PWSCC and boric acid corrosion. Therefore, the Section XI requirements continue to be met.

Quality Assurance Requirements (10 CFR 50, Appendix B):

Criterion IX states that special processes, including nondestructive testing, shall be controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements. Criterion V states that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. PVNGS complies with these standards on a programmatic basis.

Criterion XVI of Appendix B states that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. For significant conditions adverse to quality, the measures taken shall include root cause determination and corrective action to preclude repetition of the adverse conditions.

If any indication of leakage is detected during the inspections described in the response to Bulletin Item 1.A, corrective actions are required to be taken in accordance with the PVNGS corrective action program and plant procedures. Any detectable degradation of the RCPB could be considered a significant condition adverse to quality and, if so, appropriate actions, including a root cause analysis, will be taken.

In consideration of potential conditions adverse to quality, APS has been actively participating in industry organizations (Combustion Engineering Owners Group and Material Reliability Program) and continues to be aware of industry experience. APS continues to meet the requirements of 10 CFR 50, Appendix B.

NRC Generic Letter 88-05:

As discussed in the response to Bulletin Item 1.A, APS has implemented the inspection and walkdown requirements of Generic Letter 88-05.

Conclusion:

As described above for each of the applicable regulatory requirements, there is reasonable assurance that the regulatory requirements are currently being met.

NRC Required Information

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:

2. 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,

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

APS Response

APS will submit the information as requested within 30 days after plant restart following outages in which RPVH inspections are performed.

NRC Required Information

Within 60 days of the date of this bulletin, all PWR addressees are required to submit to the NRC the following information related to the remainder of the reactor coolant pressure boundary:

3.A the basis for concluding that your boric acid inspection program is providing reasonable assurance of compliance with the applicable regulatory requirements discussed in Generic Letter 88-05 and this bulletin. If a documented basis does not exist, provide your plans, if any, for a review of your programs.

APS Response

APS will provide the information requested within 60 days of the date of the bulletin.

References

1. APS Letter No. 102-04603-CDM/SAB/RJR, "Response to NRC Bulletin 2001-01: Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles," Dated September 4, 2001, from Gregg R. Overbeck, APS to USNRC.
2. PWR Materials Reliability Program Response to NRC Bulletin 2001-01 (MRP-48), dated August 2001
3. Letter RAS02-00132, Probable Cause Summary Report for CR2002-0891, Significant Degradation of the Reactor Vessel Head Pressure Boundary, from S. A> Loehlein, Root Cause Team Leader, FirstEnergy to H.. W. Bergendahl, V.P.-Nuclear, FirstEnergy, dated March 22, 2002.

Table 1, Boric Acid Leakage Program Top of Reactor Head Inspection Results

UNIT	DATE	COMPONENT	RESULTS
1 Refuel Outage #9	March-May 2001	CEDM Versa Vent 7.	There was a heavy boric acid build-up on the vent but there was no active leak. The leak stayed in the area of the vent and did not flow down to the RPVH.
		CEDM Versa Vent 75.	There was a heavy boric acid build-up on the vent but there was no active leak. The leak stayed in the area of the vent and did not flow down to the RPVH.
1 Refuel Outage #5	April-May 1995	CEDM Versa Vent 88.	There was a slight boric acid build-up on the vent but there was no active leak. The leak stayed in the area of the vent and did not flow down to the RPVH.
2 Refuel Outage #10	Spring 2002	CEDM Versa Vent 73.	There was a heavy boric acid build-up on the vent but there was no active leak. The leak stayed in the area of the vent and did not flow down to the RPVH.
2 Refuel Outage #8	March-May 1999	Valve RC-V212.	There was a medium boric acid build-up on the valve but there was no active leak. The leak stayed in the area of the valve and did not flow down to the RPVH.
2 Refuel Outage #6	Mar-May 1996	CEDM Versa Vents	A spill from versa vents above the reactor head apparently occurred when attempting to vent the RCS during RCS fill activities. The amount of water spilled was not significant and engineering has determined that the event could not have led to degradation.
3 Refuel Outage #9	September-November 2001	CEDM Versa Vent 55.	There was a medium boric acid build-up on the vent but there was no active leak. The leak stayed in the area of the vent and did not flow down to the RPVH.

Table 1, Boric Acid Leakage Program Top of Reactor Head Inspection Results (Cont. Pg. 2)

UNIT	DATE	COMPONENT	RESULTS
3 Refuel Outage #8	April-May 2000	RVLMS Connection "B" .	There was a heavy boric acid build-up on the seal but there was no active leak. The leak stayed in the area of the seal and did not flow down to the RPVH.
		CEDM Versa Vent 67.	There was a heavy boric acid build-up on the vent but there was no active leak. The leak stayed in the area of the vent and did not flow down to the RPVH.
		CEDM Versa Vent 71.	There was a slight boric acid build-up on the vent but there was no active leak. The leak stayed in the area of the vent and did not flow down to the RPVH.
3 Refuel Outage #7	September-October 1998	CEDM Versa Vent 84.	There was a heavy boric acid build-up on the vent but there was no active leak. The leak stayed in the area of the vent and did not flow down to the RPVH.
		CEDM Versa Vent 89.	There was a heavy boric acid build-up on the vent but there was no active leak. The leak stayed in the area of the vent and did not flow down to the RPVH.
3 Refuel Outage #6	February-March 1997	CEDM Versa Vent 06.	There was a heavy boric acid build-up on the vent but there was no active leak. The leak stayed in the area of the vent and did not flow down to the RPVH.
3 Refuel Outage #5	October-November 1995	CEDM Versa Vent 35. .	There was a heavy boric acid build-up on the vent but there was no active leak. The leak stayed in the area of the vent and did not flow down to the RPVH.