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United States Nuclear Regulatory Commission
Attn: Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

Subject: Davis-Besse Nuclear Power Station 15-Day Response to Bulletin 2002-01, 60-Day Response to Bulletin 2002-01, and Response to Request for Additional Information Regarding the 60-Day Response to Bulletin 2002-01

Ladies and Gentlemen:

On March 18, 2002, the Nuclear Regulatory Commission (NRC) issued Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity." The Bulletin required the FirstEnergy Nuclear Operating Company (FENOC) to provide: 1) information related to the integrity of the reactor coolant pressure boundary including the reactor pressure vessel (RPV) head and the extent to which inspections have been undertaken to satisfy applicable regulatory requirements, and 2) the basis for concluding that the Davis-Besse Nuclear Power Station, Unit Number 1, (DBNPS) satisfies the applicable regulatory requirements related to the structural integrity of the reactor coolant pressure boundary and that future inspections will ensure continued compliance with applicable regulatory requirements.

By letter dated March 25, 2002, (letter Serial Number 2775) FENOC responded to the Bulletin stating that the response for the DBNPS would be delayed until prior to restart of the DBNPS from its current outage.

Since that time, the NRC has issued Bulletin 2002-02, "Reactor Pressure Vessel Head and Vessel Head Penetration Nozzle Inspection Programs," dated August 9, 2002. This Bulletin requested information related to RPV head and RPV head penetration nozzle inspection programs and required that written responses related to licensee supplemental inspection program plans be provided to the NRC. On September 12, 2002, FENOC

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submitted a complete and comprehensive response to Bulletin 2002-02 (letter Serial Number 2804). On January 7, 2003, the NRC issued a request for additional information (RAI) related to Bulletin 2002-01 that contained nine questions pertaining to the boric acid corrosion control program. This RAI was similar to that issued to other pressurized water reactor licensees. By letter dated February 11, 2003, the NRC issued an immediately effective Order establishing interim inspection requirements for RPV heads at pressurized water reactors. FENOC responded to the Order for the DBNPS by letter dated March 1, 2003 (letter Serial Number 2837).

The purpose of this letter and associated attachments is to provide the information requested in Bulletin 2002-01 as committed in FENOC letter dated March 25, 2002, and as clarified in the January 7, 2003, RAI. As discussed with the NRC/NRR DBNPS Project Manager, it was necessary to extend the timeframe for responding to the Bulletin 2002-01 RAI due to the issuance of the aforementioned Order and ongoing NRC inspections of programs discussed in the attachments to this letter. If you have any questions or require further information, please contact Mr. Patrick J. McCloskey, Manager – Regulatory Affairs, at (419) 321-8450.

Very truly yours,

CWS

Attachments:

A. Response to Bulletin 2002-01
B. Response to Bulletin 2002-01 Request for Additional Information
C. Commitment List
D. Affirmation

cc: J. E. Dyer, Regional Administrator, NRC Region III
J. B. Hopkins, DB-1 NRC/NRR Senior Project Manager
C. S. Thomas, DB-1 NRC Senior Resident Inspector
Utility Radiological Safety Board

Response to NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity," for the Davis-Besse Nuclear Power Station, Unit Number 1 (DBNPS)

Bulletin 2002-01 required that pressurized water reactor (PWR) licensees provide information within 15 days of the date of the Bulletin, within 30 days after plant restart following the next inspection of the reactor pressure vessel (RPV) head to identify any degradation, and within 60 days from the date of the Bulletin. By letter dated March 25, 2002, (letter Serial Number 2775) the FirstEnergy Nuclear Operating Company (FENOC) responded to the Bulletin stating that the response for the DBNPS would be delayed until prior to restart of the DBNPS from its current outage. The purpose of this attachment is to provide the information required by Bulletin 2002-01 based on the current programs and conditions at the DBNPS. Since the shutdown for the 13th Refueling Outage (13 RFO) in February 2002 and the discovery of RPV head degradation, significant changes have been made to the inspection and maintenance programs at the DBNPS. These programs are discussed below. Please note that in the following discussions, the interval between each Refueling Outage is approximately 24 months, as the DBNPS operates on a 24 month fuel cycle.

The Bulletin required that PWR licensees provide the following information within 15 days of the date of the Bulletin:

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

<u>DBNPS RESPONSE</u>

During 13 RFO, a bare head visual examination was performed on the DBNPS RPV head. The visual examination identified boric acid on the RPV head. An ultrasonic examination on all the RPV head control rod drive mechanism (CRDM) nozzles was also performed. These examinations revealed through wall flaws in three CRDM nozzles. During repair activities associated with these flaws, degradation of the RPV head was identified (Licensee Event Report (LER) 2002-002-00, dated April 29, 2002).

As a result of this degradation, FENOC has replaced the DBNPS RPV head with an unused RPV head previously designated for use at the canceled Midland Plant. Information regarding this RPV head replacement was provided to the NRC in the FENOC letter (letter Serial Number1-1281) to Mr. James E. Dyer, NRC Region III Administrator, dated August 9, 2002.

Preservice (baseline) examinations have been performed on the new DBNPS RPV head. These examinations included the following:

1. Automated ultrasonic examination was performed on all 69 CRDM nozzles. These examinations were conducted from the bore of the CRDM nozzles from the bottom end of the nozzle up to a point nominally 1 inch above the topside of the RPV head base material.

2. An eddy current examination was performed on all 69 CRDM nozzles. This examination was performed from the CRDM nozzle inside diameter (ID) surfaces and included the full length of the CRDM nozzle including the CRDM nozzle flange.

3. A liquid penetrant examination was conducted of all 69 CRDM nozzle J-Groove Welds. This examination included an area 2¼ inches from the outside diameter (OD) of the CRDM nozzle around the entire circumference of the CRDM nozzle.

The following is a summary of the DBNPS inspection and maintenance programs for the RPV head.

1. Inspection programs include the following:

   The NRC provided a table of suitable supplemental inspections based on current experience and the current understanding of material degradation and wastage rates in Bulletin 2002-02, "Reactor Pressure Vessel Head and Vessel Head Penetration Nozzle Inspection Programs," dated August 9, 2002. In the response to this Bulletin, dated September 12, 2002, (letter Serial Number 2804) FENOC committed to perform comparable supplemental inspections at intervals that meet or are more conservative than the recommended intervals in Bulletin 2002-02. In addition, FENOC committed to performing bare metal inspections with qualification requirements in accordance with the requirements of the most recent revision of EPRI Technical Report 1006899, "Visual Examination for Leakage of PWR Reactor Head Penetrations on Top of RPV Head." This report provides guidance to ensure that visual inspections are capable of detecting and characterizing small amounts of boric acid deposits. Additionally, any boric acid deposits detected on the head are required to be documented in the Corrective Action Program (CAP) and evaluated using the guidance of the FENOC Boric Acid Corrosion Control (BACC) Program. This program requires an evaluation of the impact of the boric acid on pressure retaining materials.

   By letter dated February 11, 2003, the NRC issued an immediately effective Order establishing interim inspection requirements for RPV heads at pressurized water reactors. The FENOC response (letter Serial Number 2837) to the Order for the DBNPS, dated March 1, 2003, superceded the commitments related to supplemental inspection methods, scope, coverage, and the 30-day post-outage report discussed in the September 12, 2002, letter. Commitments related to supplemental inspection frequency, qualification requirements, and acceptance criteria discussed in the September 12, 2002, letter remain in effect. Specific commitments and requirements related to RPV head inspections contained in the Bulletin 2002-02 response and the response to the Order are provided in the response to item 1.D of this Attachment.

BACC Program

Bare metal visual inspections will be performed at the DBNPS every Refueling Outage after startup from the present outage (13 RFO) as discussed in the FENOC response (letter Serial Number 2804) to Bulletin 2002-02. These bare metal visual inspections are performed in accordance with the Augmented Inservice Inspection Program utilizing procedures consistent with EPRI Technical Report 1006899, "Visual Examination for Leakage of PWR Reactor Head Penetrations on Top of RPV Head."

As a result of lessons-learned during the current Refueling Outage (13 RFO) a FENOC-wide common BACC program (NOP-ER-2001, "Boric Acid Corrosion Control Program") applicable to the FENOC pressurized water reactors has been developed in accordance with Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants," for control of boric acid corrosion. The BACC program is implemented at the DBNPS by the DBNPS Boric Acid Corrosion Control Program Manual; EN-DP-01500, "Reactor Vessel Inspection Procedure;" EN-DP-01501, "Inspection of RCS Alloy 600 Components/Welds, Threaded/Bolted Connections and Targets;" and EN-DP-01506, "Borated Water System Inspections (Outside Containment)." Enhancements in the program, which includes the RPV head, as implemented at the DBNPS include:

- Clear definition of organizational responsibilities,
- Requirements to ensure that boric acid leakage is documented in the CAP and are categorized as a Condition Adverse to Quality,
- BACC Program Owner involvement in the determination of the appropriate action(s) in response to a leak or corrosion site,
- BACC Program Owner analysis of BACC database for trends and failure mechanism and the documenting of adverse trends in the CAP,
- BACC Program Owner incorporation of program improvements based on reviews of industry operating experience,
- BACC Program Owner provides a periodic report for the senior management team,

- BACC Program Owner serves as Key Outage Project Owner for boric acid activities during Refueling Outages,
- EPRI Publication 1000975, "Boric Acid Corrosion Guidebook, Revision 1: Managing Boric Acid Corrosion Issues at PWR Power Stations," is used as a reference document in the BACC Program,
- Requiring that evaluations of boric acid leakage under the CAP include consideration of engineering changes (such as the use of corrosion resistant materials) as a preventative measure to preclude corrosion, and
- A more closely integrated BACC Program with other programs and procedures dealing with inspections and leakage identification.

American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI Program

The RPV head is VT-2 examined in accordance with Examination Category B-P of ASME Section XI during the system leakage test conducted prior to plant startup following each Refueling Outage. This examination is conducted in Mode 3 at normal operating pressures in accordance with ASME Section XI system leakage test requirements. The examination is performed with insulation installed in accordance with the inspection requirements of IWA-5242, Insulated Components. As permitted by IWA-5242, the VT-2 examination is performed at the lowest elevation. During the system leakage test, the CRDM nozzles and flanges which protrude above the RPV head insulation are remotely examined from the top of the service structure to identify any leakage which may flow through the insulation onto the RPV head surface.

2. Maintenance programs include the following:

Containment Ventilation Systems Preventative Maintenance

During Refueling Outages, maintenance personnel perform various Preventative Maintenance (PM) tasks on the Containment ventilation components. These tasks include inspection and cleaning of the CRDM ventilation fans and the Containment Air Coolers. Any abnormalities identified during the performance of these PMs, such as boric acid buildup, are addressed through the CAP.

Refueling-Related Maintenance Activities

Refueling-related maintenance activities provide an opportunity for inspection and observation of the exposed surfaces of the reactor vessel for evidence of boric acid leakage. These activities are typically conducted every two (2) years based on the scheduled Refueling Outage intervals.

1.B. 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.

DBNPS RESPONSE

The NRC provided a table of suitable supplemental inspections based on current experience and the current understanding of material degradation and wastage rates in Bulletin 2002-02. In the response to this Bulletin, dated September 12, 2002, (letter Serial Number 2804) FENOC committed to perform comparable supplemental inspections at intervals that meet or are more conservative than the recommended intervals in Bulletin 2002-02. In addition, FENOC committed to performing bare metal inspections with qualification requirements in accordance with the requirements of the most recent revision of EPRI Technical Report 1006899, "Visual Examination for Leakage of PWR Reactor Head Penetrations on Top of RPV Head." This report provides guidance to ensure that visual inspections are capable of detecting and characterizing small amounts of boric acid deposits.

By letter dated February 11, 2003, the NRC issued an immediately effective Order establishing interim inspection requirements for RPV heads at pressurized water reactors. The FENOC response to the Order for the DBNPS, dated March 1, 2003, superceded the commitments related to supplemental inspection methods, scope, coverage, and the 30-day post-outage report discussed in the September 12, 2002, letter. Commitments related to supplemental inspection frequency, qualification requirements, and acceptance criteria discussed in the September 12, 2002, letter remain in effect. Specific commitments and requirements related to RPV head inspections contained in the Bulletin 2002-02 response and the response to the Order are provided in the response to item 1.D of this Attachment.

Therefore, the above-discussed inspection and maintenance programs provide reasonable assurance that degradation of the RPV head will be identified.

1.C. 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.

DBNPS RESPONSE

The DBNPS provided a description of a degradation of the original RPV head due to boric acid corrosion resulting from CRDM nozzle leakage over a significant period of time in LER 2002-002-00, dated April 29, 2002, and in the root cause analysis report regarding RPV head degradation (letter Serial Number 1-1289) dated September 23, 2002.

As a result of this degradation, FENOC has replaced the DBNPS RPV head with an unused RPV head previously designated for use at the canceled Midland Plant. Information regarding this RPV head replacement was provided to the NRC in the FENOC letter (letter Serial Number1-1281) to Mr. James E. Dyer, NRC Region III Administrator, dated August 9, 2002.

1.D. 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.

DBNPS RESPONSE

Bulletin 2002-02 requested information related to RPV head and RPV head penetration nozzle inspection programs and required that written responses related to licensee inspection program plans be provided. FENOC supplied a complete and comprehensive response to Bulletin 2002-02 by letter dated September 12, 2002 (letter Serial Number 2804). This response addressed inspection methods, scope, frequency, qualification requirements, and acceptance criteria. By letter dated February 11, 2003, the NRC issued an immediately effective Order establishing interim inspection requirements for RPV heads at pressurized water reactors. The FENOC response to the Order for the DBNPS, dated March 1, 2003, superceded the commitments related to supplemental inspection methods, scope, coverage, and the 30-day post-outage report discussed in the September 12, 2002, letter. Commitments related to supplemental inspection frequency, qualification requirements, and acceptance criteria discussed in the September 12, 2002, letter remain in effect. The inspection method(s), scope, frequency, qualification requirements, and acceptance criteria committed to in letter Serial Number 2804 and letter Serial Number 2837 are the same as or more conservative than the NRC recommended or ordered requirements and are as follows:

1. A bare metal visual examination of 100% of the RPV head surface (including 360° around each RPV head penetration nozzle) shall be performed every Refueling Outage. (Bulletin 2002-02 response as modified by the Order)

2. Ultrasonic Testing (UT) of each RPV head penetration nozzle (i.e., nozzle base material) 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 shall be performed in 15 RFO, 17 RFO, 19 RFO, 20 RFO, and each refueling thereafter for the existing replacement RPV head. (Bulletin 2002-02 response as modified by the Order)

3. Eddy current testing or dye penetrant testing of the wetted surface of each J-groove weld and RPV head penetration nozzle base material to at least two (2) inches above the J-groove weld shall be performed in 15 RFO, 17 RFO, 19 RFO, 20 RFO, and each refueling thereafter for the existing replacement RPV head. (Bulletin 2002-02 response as modified by the Order)

4. Visual inspections shall be performed to identify potential boric acid leaks from pressure-retaining components above the RPV head. For boron deposits on the surface of the RPV head or related insulation, discovered either during the inspections required by the Order or otherwise and regardless of the source of the deposit, before returning the plant to operation, perform inspections of the affected RPV head surface and penetrations appropriate to the conditions found in order to verify the integrity of the affected area and penetrations every Refueling Outage. (The Order)

5. Acceptance Criteria will conform to the recommendations provided in the letter from Mr. Jack Strosnider, Director, Division of Engineering, Office of Nuclear Reactor Regulation, NRC, to Mr. Alex Marion, Director Engineering, Nuclear Energy Institute, dated November 21, 2001, with the exception that flaw growth rate will be calculated in accordance with the guidance provided by MRP-55, "Materials Reliability Program (MRP) Crack Growth Rates for Evaluating Primary Water Stress Corrosion Cracking (PWSCC) of Thick-Wall Alloy 600 Material." (Bulletin 2002-02 response)

6. Personnel and procedures will be qualified in accordance with the applicable sections of ASME Code Section V, "Nondestructive Examination," and XI, "Rules for Inservice Inspection of Nuclear Power Plant Components." The visual qualification requirements will be in accordance with the requirements of the most recent revision of EPRI Technical Report 1006899, "Visual Examination for Leakage of PWR Reactor Head Penetrations on Top of RPV Head." (Bulletin 2002-02 response)

1.E. Your conclusion regarding whether there is reasonable assurance that regulatory requirements are currently being met (see the Applicable Regulatory Requirements, above). 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.

(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.

DBNPS RESPONSE

The Applicable Regulatory Requirements section of Bulletin 2002-01 lists the following regulatory requirements and plant Operating License (Technical Specifications) requirements pertaining to RCPB integrity:

- Appendix A to 10 CFR 50, "General Design Criteria for Nuclear Power plants"
  - Criterion 14 – "Reactor Coolant Pressure Boundary"
  - Criterion 31 – "Fracture Prevention of Reactor Coolant Pressure Boundary"
  - Criterion 32 – "Inspection of Reactor Coolant Pressure Boundary"
- 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 50, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants;" Criteria V, "Instructions, Procedures, and Drawings;" IX, "Control of Special Processes;" and XVI, "Corrective Actions"
- Plant Operating License, Appendix A Technical Specifications
- Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants"

The following addresses these requirements for the DBNPS.

10 CFR 50, Appendix A – General Design Criteria (GDCs)

The GDCs included in Appendix A to 10 CFR 50 did not become effective until May 21, 1971. The construction permit for the DBNPS was issued prior to May 21, 1971; consequently, the DBNPS was not subject to the Appendix A GDCs (reference SECY-92-223, 9/18/92). However, the following addresses compliance with the intent of the design criteria for the RCPB.

- Criterion 14 – Reactor Coolant Pressure Boundary

  "The reactor coolant pressure boundary shall be designed, fabricated, erected, and tested so as to have an extremely low probability of abnormal leakage, of rapidly propagating failure, and of gross failure."

  Compliance with the intent of GDC-14 is described in the DBNPS Updated Safety Analysis Report (USAR), Appendix 3D.1.10. The inspection and maintenance programs described in the above sections 1.A, 1.B, and 1.D of this attachment describe a means of preventing thinning, pitting, or other forms of degradation of the RPV head. Through the prevention of degradation of the RPV head there is an extremely low probability of abnormal leakage, of rapidly propagating failure, and of gross failure. By maintaining these or other equivalent programs there is a reasonable assurance of continued compliance with this criterion.

- Criterion 31 – Fracture Prevention of Reactor Coolant Pressure Boundary

  "The reactor coolant pressure boundary shall be designed with sufficient margin to assure that when stressed under operating, maintenance, testing, and postulated accident conditions (1) the boundary behaves in a nonbrittle manner and (2) the probability of rapidly propagating failure is minimized. The design shall reflect consideration of service temperatures and other conditions of the boundary material under operating, maintenance, testing, and postulated accident conditions and the uncertainties in determining (1) material properties, (2) the effects of irradiation on material properties, (3) residual, steady state and transient stresses, and (4) size of flaws."

  Compliance with the intent of GDC 31 is described in the DBNPS Updated Safety Analysis Report (USAR), Appendix 3D.1.27. The replacement RPV head was designed and constructed of materials that have sufficient margin to behave in a nonbrittle manner under operating conditions. The inspection and maintenance programs described in the above sections 1.A, 1.B, and 1.D of this attachment describe a means of preventing thinning, pitting, or other forms of degradation of the RPV head. Maintaining the RPV head in this manner provides reasonable assurance that the RPV head will behave in a nonbrittle manner without rapidly propagating fracture. By maintaining these or other equivalent programs there is a reasonable assurance of continued compliance with this criterion.

- Criterion 32 – Inspection of Reactor Coolant Pressure Boundary

  "Components which are part of the reactor coolant pressure boundary shall be designed to permit (1) periodic inspection and testing of important areas and features to assess their structural and leaktight integrity, and (2) an appropriate material surveillance program for the reactor pressure vessel."

  Compliance with the intent of GDC 32 is described in the DBNPS Updated Safety Analysis Report (USAR), Appendix 3D.1.28. The inspection and maintenance programs described in the above sections 1.A, 1.B, and 1.D of this attachment address periodic inspection and testing of the RPV head and the RPV head nozzles to assess their structural and leaktight integrity. New CRDM service structure inspection access ports were added during 13 RFO to facilitate the above inspections.

<u>10 CFR 50.55a – Codes and Standards</u>

10 CFR 50.55a, "Codes and Standards," requires that inservice inspection and testing be performed in accordance with the requirements of the ASME Boiler and Pressure Vessel Code, Section XI, "Inservice Inspection of Nuclear Plant Components." Section XI contains the applicable rules for the examination, evaluation, and repair of ASME Code components which includes the reactor coolant pressure boundary.

The DBNPS Third Ten-Year Inservice Inspection (ISI) Interval, which commenced on September 21, 2000, is implemented in accordance with the 1995 Edition through the 1996 Addenda of ASME Section XI. There are no specific nondestructive examination requirements specified for the CRDM nozzle partial penetration welds. The examination of the CRDM nozzles is conducted under Examination Category B-P, "All Pressure Retaining Components." Examination Category B-P requires a VT-2 visual examination of the reactor vessel pressure retaining boundary each Refueling Outage during the system leakage test conducted at normal operating pressures. This examination is conducted without the removal of insulation as permitted by IWA-5242, "Insulated Components." The VT-2 examination results are compared with the acceptance standards of IWB-3522, which require correction of pressure boundary leakage prior to continued service.

As described above, the DBNPS performs the examination of the CRDM nozzles as required by the 1995 Edition through the 1996 Addenda of ASME Section XI. Therefore, the DBNPS is in compliance with the requirements of 10 CFR 50.55a.

10 CFR 50, Appendix B – Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants

- Criterion V – Instructions, Procedures, and Drawings

  "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. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished."

  Activities associated with the RPV head (including tests and inspections)are performed in accordance with the FENOC Quality Assurance Program. Procedures that address activities associated with quality-related structures, systems, and components are subject to an established preparation, review, and approval process as defined in the Quality Assurance Program. Appropriate quantitative or qualitative acceptance criteria is required to be included in procedures.

- Criterion IX – Control of Special Processes

  "Measures shall be established to assure that special processes including welding, heat treating, and nondestructive testing are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements."

  FENOC has established and implemented a Quality Assurance Program that conforms to the criteria established in Appendix B, Criterion IX to 10 CFR, Part 50. Repairs and inspections are conducted and qualified as per ASME Section XI Code. Where the ASME Section XI is not applicable, personnel and processes are qualified and/or demonstrated in accordance with the FENOC Quality Assurance Program.

- Criterion XVI – Corrective Action

  "Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. The identification of the significant condition adverse to quality, the cause of the condition, and the corrective action taken shall be documented and reported to appropriate levels of management."

Activities associated with the RPV head (including corrective actions) are performed in accordance with the FENOC Quality Assurance Program. Under this program, personnel are responsible for the implementation of the Quality Assurance Program as it pertains to the performance of their activities. The FENOC Corrective Action Program requires that conditions adverse to quality be corrected. In the case of significant conditions adverse to quality, the procedures require that the cause of the condition be determined and action taken to preclude recurrence. These provisions apply to conditions adverse to quality associated with the RPV head.

Plant Operating License, Appendix A – Technical Specifications

DBNPS Technical Specification Limiting Condition for Operation (LCO) 3.4.6.2 includes a requirement and associated action statements addressing reactor coolant system leakage. The limits for reactor coolant system leakage are stated in terms of the amount of leakage, e.g., ≤ 1 gpm for unidentified leakage; ≤10 gpm for identified leakage; and no RCPB leakage.

Leaks from Alloy 600 RPV head penetrations due to PWSCC can be well below the sensitivity of on-line leakage detection systems. This condition has been evaluated by the industry and the NRC and it has been determined that the appropriate inspections are bare-metal visual inspections for boric acid deposits during plant shutdowns and periodic nondestructive examinations of CRDM nozzle and J-groove welds. If leakage or unacceptable indications are found, the defect must be repaired before the plant goes back on line. If RCS leakage during DBNPS operation increases to the point where it exceeds plant administrative limits, then the leak must be evaluated. These administrative limits are a fraction of the Technical Specification leakage limits and support maintaining compliance with the Technical Specifications. The inspection and maintenance programs described in the above sections 1.A, 1.B, and 1.D of this attachment provide reasonable assurance of RCPB integrity and Technical Specification compliance.

Generic Letter 88-05 – Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants

Generic Letter 88-05 requested Licensees to provide assurances that a program has been implemented consisting of systematic measures to ensure that boric acid corrosion does not lead to degradation of the assurance that the reactor coolant pressure boundary will have an extremely low probability of abnormal leakage, rapidly propagating failure, or gross rupture. Generic Letter 88-05 stated: "The program should include the following:

(1) A determination of the principal locations where leaks that are smaller than the allowable technical specification limit can cause degradation of the primary pressure boundary by boric acid corrosion. Particular consideration should be given to identifying those locations where conditions exist that could cause high concentrations of boric acid on pressure boundary surfaces.

(2) Procedures for locating small coolant leaks (i.e., leakage rates at less than technical specification limits). It is important to establish the potential path of the leaking coolant and the reactor pressure boundary components it is likely to contact. This information is important in determining the interaction between the leaking coolant and reactor coolant pressure boundary materials.

(3) Methods for conducting examinations and performing engineering evaluations to establish the impact on the reactor coolant pressure boundary when leakage is located. This should include procedures to promptly gather the necessary information for an engineering evaluation before the removal of evidence of leakage, such as boric acid crystal buildup.

(4) Corrective actions to prevent recurrences of this type of corrosion. This should include any modifications to be introduced in the present design or operating procedures of the plant that (a) reduce the probability of primary coolant leaks at the locations where they may cause corrosion damage and (b) entail the use of suitable corrosion resistant materials or the application of protective coatings/claddings."

As a result of lessons-learned during the current Refueling Outage (13 RFO) a FENOC-wide common BACC Program has been developed in accordance with Generic Letter 88-05 for control of boric acid corrosion. The BACC Program contains requirements for the site BACC Program Owner to maintain a site-specific list of principal leak locations and requires this list to be updated based on reviews of industry operating experience. The BACC Program requires evidence of boric acid leakage to be examined and evaluated. The program requires an as-found examination of the area of identified boron deposits and requires examination and evaluation to determine the extent of condition and the leakage pathway. Components affected by the leak are identified and evaluated. The BACC Program requires that evidence of boric acid leakage be documented in the CAP. The program also provides requirements for the establishment of corrective actions under the CAP to restore or preserve corroded surfaces/components, and requires the Evaluator to consider preventative actions that include consideration of engineering changes and/or procedure revisions which would (1) reduce the probability of leaks at locations where they may cause corrosion damage, (2) entail the use of corrosion resistant materials or the application of protective coatings or claddings, and (3) redesign the insulation layout to permit draining or shunting of leaks away from critical areas. Therefore, the FENOC BACC Program complies with Generic Letter 88-05.

Based upon the above, FENOC concludes that there is reasonable assurance that the applicable regulatory requirements are currently being met.

Bulletin 2002-01 also required that pressurized water reactor (PWR) licensees provide the following information related to the remainder of the reactor coolant pressure boundary within 60 days of the date of the Bulletin:

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.

DBNPS RESPONSE

Subsequent to the issuance of Bulletin 2002-01, the NRC issued an RAI (dated January 7, 2003) related to the above 60-day response of Bulletin 2002-01. The RAI consisted of nine questions and was intended to clarify the information licensees were to provide to facilitate a comprehensive staff review of their Boric Acid Corrosion Control programs. The responses to the RAI provided in Attachment B are intended to also satisfy the 60-day response of Bulletin 2002-01.

Response to NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity," 60-Day Response for the Davis-Besse Nuclear Power Station, Unit Number 1, (DBNPS), Request for Additional Information (RAI) Regarding Boric Acid Corrosion Control Programs

On January 7, 2003, the NRC issued an RAI consisting of nine questions related to the information concerning the reactor coolant pressure boundary requested in the 60-day response required by Bulletin 2002-01. The purpose of the RAI is to clarify the 60-day information request of Bulletin 2002-01. The purpose of this attachment is to provide the information required by the Bulletin 2002-01 RAI based on the current programs and conditions at the DBNPS. Since the shutdown for the 13th Refueling Outage (13 RFO) in February 2002 and the discovery of RPV head degradation, significant changes have been made to the inspection and maintenance programs at the DBNPS. These programs are discussed below. Please note that in the following discussions, the interval between each Refueling Outage is approximately 24 months, as the DBNPS operates on a 24 month fuel cycle.

Responses to the nine questions are provided as follows.

1. **Provide detailed information on, and the technical basis for, the inspection techniques, scope, extent of coverage, and frequency of inspections, personnel qualifications, and degree of insulation removal for examination of Alloy 600 pressure boundary material and dissimilar metal Alloy 82/182 welds and connections in the reactor coolant pressure boundary (RCPB). Include specific discussion of inspection of locations where reactor coolant leaks have the potential to come in contact with and degrade the subject material (e.g., reactor pressure vessel (RPV) bottom head).**

   DBNPS RESPONSE

   Table 1 describes the current program status of Alloy 600 pressure boundary material and dissimilar metal Alloy 82/182 welds and connections in the RCPB at the DBNPS, as of the date of this submittal. Alloy 600 RCPB material locations and Alloy 82/182 welds and connections have been determined from a review of component drawings and vendor reports. Changes to the program include consideration of operating experience and vendor recommendations.

   Visual examinations are performed on Alloy 600 pressure boundary material and dissimilar metal Alloy 82/182 welds and connections within the RCPB in accordance with procedures EN-DP-01500, "Reactor Vessel Inspection Procedure," and EN-DP-01501, "Inspection of RCS Alloy 600 Components/Welds, Threaded/Bolted Connections and Targets." The scope of these procedures include all Alloy 600/82/182 pressure retaining material except Once Through Steam Generator (OTSG) tubing and tubesheet cladding. These procedures are conducted under the Boric Acid Corrosion Control (BACC) Program, NOP-ER-2001, "Boric Acid Corrosion Control Program." Inspection techniques are described in the procedures. Inspections under these procedures are performed by qualified BACC Inspectors. Inspections of the RPV head and 69 control rod drive mechanism (CRDM) nozzles performed in accordance with EN-DP-01500 are also conducted by certified VT-2 visual examination personnel. All inspections are "bare metal" with insulation removed as required to allow 100% coverage of the exterior surface of the pressure boundary. When evidence of leakage is noted, additional insulation is removed to the extent necessary to determine if any degradation of the carbon and low alloy steel within the RCPB has occurred.

BACC Inspectors are required to have a current (within one year) eye examination and receive training and testing in:

- the effects of boric acid on plant components (specifically Alloy 600 and carbon steel),
- the characteristics of boric acid residue/corrosion (including proper categorization),
- the DBNPS systems containing borated water solutions and susceptible piping and components
- the procedures that implement the BACC program,
- the boric acid inspection guidelines, and
- the field inspection tools.

The DBNPS Third Ten-Year Inservice Inspection (ISI) Interval, which commenced on September 21, 2000, is implemented in accordance with the 1995 Edition through the 1996 Addenda of ASME Section XI. Dissimilar metal welds are examined in accordance with either Examination Category B-F, "Pressure Retaining Dissimilar Metal Welds in Vessel Nozzles" or Examination Category B-J, "Pressure Retaining Welds in Piping" and Examination Category B-P, "All Pressure Retaining Components." Components exempt from the nondestructive examinations required by Examination Categories B-F or B-J are determined in accordance with the 1989 Edition of ASME Section XI as required by 10 CFR 50.55a. Table 1 provides a current listing of ASME Section XI examinations performed on the RCPB dissimilar metal welds and the personnel qualification requirements required to perform these inspections. Examination of the Alloy 600 Steam Generator tubing is performed in accordance with the DBNPS Technical Specifications.

2. **Provide the technical basis for determining whether or not insulation is removed to examine all locations where conditions exist that could cause high concentrations of boric acid on pressure boundary surfaces or locations that are susceptible to primary water stress corrosion cracking (Alloy 600 base metal and dissimilar metal Alloy 82/182 welds). Identify the type of insulation for each component examined, as well as any limitations to removal of insulation. Also include in your response actions involving removal of insulation required by your procedures to identify the source of leakage when relevant conditions (e.g., rust stains, boric acid stains, or boric acid deposits) are found.**

DBNPS RESPONSE

The BACC Program requires removal of insulation to perform inspections of principal leak locations (See Table 1 for current description). Principal leak locations are identified based on industry operating experience as compiled in EPRI Publication 1000975, "Boric Acid Corrosion Guidebook, Revision 1: Managing Boric Acid Corrosion Issues at PWR Power Stations," Section 2. The list of principal leak locations is required to be periodically updated, based on industry operating experience. The insulation used on RCPB components is predominantly reflective mirror insulation. Inspections on the RPV can be performed with limited insulation removal by using qualified remote visual techniques (e.g., crawlers and boroscopes). The FENOC BACC Program also requires removal of insulation as needed to determine the source of the leakage and leakage pathway when evidence of leakage is detected.

3. **Describe the technical basis for the extent and frequency of walkdowns and the method for evaluating the potential for leakage in inaccessible areas. In addition, describe the degree of inaccessibility, and identify any leakage detection systems that are being used to detect potential leakage from components in inaccessible areas.**

DBNPS RESPONSE

During the System Leakage Test required by Examination Category B-P, the required VT-2 examinations are performed with the insulation installed as permitted by IWA-5242 of ASME Section XI. The System Leakage Test is conducted at nominal operating pressure prior to plant startup following each Refueling Outage. The portions of the RCPB requiring examination during the System Leakage Test have been walked down to confirm that areas requiring access for examination are in fact accessible. This walkdown confirmed that access to the lowest levels of vertical surfaces and the insulation joints of horizontal insulation surfaces is available during the System Leakage Test. In some areas, remote VT-2 examinations will be required due to exceeding the maximum direct examination distance requirements of

Table IWA-2210-1. Therefore, during Refueling Outages there are no inaccessible areas of the RCPB.

Portions of the RCPB are located within the secondary shielding and are inaccessible during reactor operation. Containment accessible areas are not periodically walked down during power operation. However, walkdowns would occur for cause from leakage trends and indicators. The following programs and systems are used to detect potential leakage from inaccessible areas during power operation:

1. RCS Integrated Leakage Program

   The RCS Integrated Leakage Program, NG-EN-00327, "RCS Integrated Leakage Program," is intended to maintain leakage of reactor coolant at the lowest attainable values, provide reasonable assurance that the plant will not be operated with RCPB leakage, and ensure the earliest possible detection and evaluation of new or increasing RCS leakage. This program places administrative limits on total boric acid accumulation in Containment, unidentified RCS leakage, sustained step changes of unidentified RCS leakage, sustained step changes of Containment sump pump-out rate, rates of change of unidentified or identified RCS leakage, and cumulative unidentified leakage. In addition to trending the parameters that comprise the administrative limits, the program also trends and evaluates parameters such as reactor coolant pump seal leakoff rates, rate of quench tank in-leakage, calculated primary-to-secondary leak rate, and Containment atmosphere gaseous, and particulate activities. The RCS Integrated Leakage Program is implemented by EN-DP-01171, "Engineering Implementation of the RCS Integrated Leakage Program," and DB-OP-01200, "Reactor Coolant System Leakage Management." The RCS water inventory balance surveillance procedure is performed, at a minimum, every 72 hours during steady state power operations as required by Technical Specification Surveillance Requirement (SR) 4.4.6.2.1.d. RCS leak rates significantly lower than the Technical Specification Limiting Condition for Operation (LCO) 3.4.6.2 limits can be identified and trended using this surveillance.

   The RCS Integrated Leakage Program establishes those actions and evaluations that are required to be performed should any of the administrative limits be exceeded, upon determination of any adverse trend in RCS leakage indicators, or upon visual identification of RCS leakage. The program provides for identification of the leak source (including walk downs of accessible areas), evaluation of potential hazards from the RCS leakage and its impact on continued safe operation, actions to stop the leak (if possible), and actions to shut the plant down (if necessary) to allow for a Containment inspection for the leakage source.

2. Containment Atmosphere Monitors

   Technical Specification SR 4.4.6.2.1 requires that the Containment atmosphere gaseous or particulate radioactivity be monitored at least once per 12 hours. Technical Specification LCO 3.4.6.1.b requires that at least one Containment atmosphere radioactivity monitor (particulate or gaseous) be operable. The Containment atmosphere is monitored by two identical radioactivity monitors during normal operation. Each system is capable of detecting particulate activity and gaseous activity at levels corresponding to RCS leakage at a fraction of the Technical Specification LCO 3.4.6.2 leakage limits. The monitors are considered to be redundant, in that their sample points are on the East and West sides of Containment. Normally, each monitor is aligned to sample from the top of the secondary shield wall of its respective D-ring.

During a November 26, 2002, meeting with the NRC to discuss DBNPS incore monitoring instrumentation nozzles, inspection and potential leakage, FENOC committed to make efforts to install the FLÜS on-line leak monitoring system during the current outage or, if it cannot be installed then, during the Mid-Cycle 14 outage. As described during the meeting, the system is expected to have a sensitivity to leakage in the range of $4x10^{-3}$ to $2x10^{-2}$ gpm, depending on the air-tightness of the reactor vessel insulation. The FLÜS system is currently being installed to monitor the RPV bottom head incore instrumentation nozzles. Following installation and testing, the FLÜS system is expected to be incorporated in the RCS Integrated Leakage Program.

4. **Describe the evaluations that would be conducted upon discovery of leakage from mechanical joints (e.g., bolted connections) to demonstrate that continued operation with the observed leakage is acceptable. Also describe the acceptance criteria that was established to make such a determination. Provide the technical basis used to establish the acceptance criteria. In addition,**

   a. **if observed leakage is determined to be acceptable for continued operation, describe what inspection/monitoring actions are taken to trend/evaluate changes in leakage, or**

   b. **if observed leakage is not determined to be acceptable, describe what corrective actions are taken to address the leakage.**

<u>DBNPS RESPONSE</u>

The BACC Program requires individuals discovering evidence of boric acid leakage (in any mode of operation) to document the leakage in the CAP. This includes evidence of boric acid leakage from mechanical joints. The Operations Shift Manager is promptly notified of any active leakage or degraded components. The program requires a BACC

Inspector to perform an initial inspection to document the "as-found" condition. A visual inspection is required to completely (360°) examine the identified item. The area of identified boron build-up is inspected to determine the extent of condition and the leakage pathway. All components affected by the leak with boric acid deposits or corrosion are required to be inspected and evaluated. Affected areas are inspected to identify any signs of potential corrosion.

The BACC Program also provides supplemental guidance for evaluating boric acid leakage under the CAP. Specific requirements associated with leaking bolted connections include:

- a detailed description of visible damage to the affected area,
- pictures of the affected area are taken,
- a determination if wastage has occurred by careful examination of component bolting,
- a determination of the material make-up of affected components through physical inspection of the component, and
- an evaluation for the use of a collection system to direct leakage away from other components and targets.

If corrosion has caused noticeable wastage of a pressure boundary component that will not be replaced, the amount of wastage is quantified by field measurements, any necessary stress calculations for assessing continued pressure boundary integrity are performed, and guidance contained in EPRI Publication 1000975, "Boric Acid Corrosion Guidebook, Revision 1: Managing Boric Acid Corrosion Issues at PWR Power Stations," November 2001, is used for evaluating the acceptability of continued operation with degradation. The BACC Program also requires that, for boric acid identified on bolting, the Condition Report Evaluator ensures that the requirements of ASME Section XI paragraph IWA-5250 or ASME Boiler and Pressure Vessel Code Case N-566-1, as appropriate, are addressed.

<u>DBNPS RESPONSE to 4.a</u>

IWA-5250(a)(2) provides requirements when leakage is discovered at a bolted connection on a borated water system. Code Case N-566-1, which was approved for the DBNPS by the NRC via Relief Request RR-A10, provides alternative requirements to IWA-5250(a)(2). If leakage is not stopped at a bolted connection, the bolted joint must be evaluated for joint integrity in accordance with IWB-3142.4, "Acceptance by Analytical Evaluation." This evaluation requires the following considerations:

- the number and service age of the bolts,

- bolt and component material,
- corrosiveness of process fluid,
- leakage location and system function,
- leakage history at the connection or other system components, and
- visual evidence of corrosion at the assembled joint. The VT-1 visual examination method is used to inspect the joint.

The BACC Program describes the additional inspection/monitoring actions that are taken if observed leakage is determined to be acceptable for continued operation. The program requires that a Condition Report Corrective Action be assigned to the implementing Supervisor for periodic inspections. This Corrective Action is required to explicitly provide the required monitoring interval (initially based on the expected rate of degradation), individual qualifications for monitoring personnel, monitoring scope, and acceptance criteria or threshold for further actions. The monitoring frequency may be revised based on the actual observed rate of degradation, as approved by the organization that specified the original monitoring frequency.

DBNPS RESPONSE to 4.b

If observed leakage is determined to be unacceptable, the leak source would be removed from service, repaired, or the plant would be shutdown.

5. **Explain the capabilities of your program to detect the low levels of RCPB leakage that may result from through-wall cracking in the bottom reactor pressure vessel (RPV) head incore instrumentation nozzles. Low levels of leakage may call into question reliance on visual detection techniques or installed leakage detection instrumentation, and has the potential for causing boric acid corrosion. The Nuclear Regulatory Commission has had a concern with the bottom RPV head incore instrumentation nozzles because of the potential consequences associated with loss of integrity of the bottom head nozzles. Describe how your program would evaluate evidence of possible leakage in this instance. In addition, explain how your program addresses leakage that may impact components that are in the leak path.**

DBNPS RESPONSE

Each Refueling Outage, an "as-found" visual/video inspection of the bottom RPV head incore instrumentation nozzles is performed. The inspection consists of a complete 360° examination of each nozzle. The inspection is required to document any evidence of leakage, boric acid residue, the leakage source, discoloration or any evidence of corrosion and the amount of boric acid found. A representative photo (or video still frame) of each nozzle is retained. The area of identified boron build-up is inspected to determine the extent of condition and the leakage pathway. Components affected by the leak with boric acid deposits or corrosion are required to be examined. Affected areas are inspected to identify any signs of potential corrosion. If indications of leakage or corrosion are observed, a Condition Report is generated for evaluation of the condition. The Operations Shift Manager is notified of any immediate safety concerns. The Plant Engineering Manager is also notified.

During a November 26, 2002, meeting with the NRC to discuss the DBNPS incore monitoring instrumentation nozzles, inspection and potential leakage, FENOC committed to make efforts to install the FLÜS on-line leak monitoring system during the current outage or, if it cannot be installed then, during the Mid-Cycle 14 outage. As described during the meeting, the system is expected to have a sensitivity to leakage in the range of $4x10^{-3}$ to $2x10^{-2}$ gpm, depending on the air-tightness of the reactor vessel insulation. The FLÜS system is currently being installed to monitor the RPV bottom head incore instrumentation nozzles. Following installation and testing, the FLÜS system is expected to be incorporated in the RCS Integrated Leakage Program.

6. **Explain the capabilities of your program to detect the low levels of RCPB leakage that may result from through-wall cracking in certain components and configurations for other small diameter nozzles. Low levels of leakage may call into question reliance on visual detection techniques or installed leakage detection instrumentation, and has the potential for causing boric acid corrosion. Describe how your program would evaluate evidence of possible leakage in this instance. In addition, explain how your program addresses leakage that may impact components that are in the leak path.**

DBNPS RESPONSE

During normal plant operation, reactor coolant leakage of any type (including RCPB leakage) is evaluated through the RCS Integrated Leakage Program. Although Technical Specification SR 4.4.6.2.1 requires that the RCS water inventory balance be performed at least once per 72 hours, the plant typically runs a RCS water inventory balance surveillance daily for a 4-hour period. A baseline leakage rate is established during the first week of approximately 100% steady state power after a shutdown in which full Containment walkdowns / inspections have been performed. Trending of the RCS water inventory balance is used to indicate a rate of change and a sustained step change from baseline. A cumulative amount of RCS leakage is also maintained for both the amount of RCS that has leaked out and the amount of boric acid that has leaked. Containment Sump pump-out rate, Quench Tank inleakage rates, and Containment Radiation Monitor readings are also trended.

The program requires station management involvement and requires various actions to locate and correct leakage that may include plant shutdown. Should an administrative limit (which is more conservative than the limits specified in the Technical Specifications) be exceeded, an adverse trend in RCS leakage indicators be noted, or RCS leakage be identified visually, the condition would be documented in the CAP for evaluation. The RCS Integrated Leakage Program also invokes the BACC Program.

Upon discovery of evidence of boric acid leakage, the BACC Program requires that a BACC Inspector perform an initial inspection to document the "as-found" condition. A visual inspection is required to completely (360°) examine the identified item. The area of identified boron build-up is inspected to determine the extent of condition and the leakage pathway. Components affected by the leak with boric acid deposits or corrosion are required to be examined. Affected areas are inspected to identify any signs of potential corrosion. The BACC Program requires the CAP evaluation to consider leak rate trends, potential degradation (including impact on components in the leak path), other leakage indicators, and risk associated with unknown leakage sources. The evaluation will also document any compensatory measures used to locate, repair, or minimize the impact of a leak and the maximum time that operation may continue with the leakage. The Operations Shift Manager is promptly notified of any active leakage or degraded components. If leakage has deposited boric acid on pressure retaining materials that are susceptible to boric acid corrosion, an Inservice Inspection Engineer is notified to evaluate the leakage and ensure compliance with IWA-5250.

7. **Explain how any aspects of your program (e.g., insulation removal, inaccessible areas, low levels of leakage, evaluation of relevant conditions) make use of susceptibility models or consequence models.**

DBNPS RESPONSE

Susceptibility and consequence models are not currently incorporated in the DBNPS inspection programs. Currently, the BACC Program requires bare metal inspections of susceptible components (See Table 1 for current description) each Refueling Outage. Susceptibility and consequence models may be used to establish inspection frequencies in the future.

8. **Provide a summary of recommendations made by your reactor vendor on visual inspections of nozzles with Alloy 600/82/182 material, actions you have taken or plan to take regarding vendor recommendations, and the basis for any recommendations that are not followed.**

DBNPS RESPONSE

During 13 RFO, FENOC performed 360° bare metal visual examinations of the bottom RPV head incore instrumentation nozzles as part of the Extent of Condition Program associated with the DBNPS RPV head degradation. However, the inspection results on several of the bottom RPV head incore instrumentation nozzles were obscured by boric acid deposits believed to be wash-down from the upper RPV head. Framatome ANP prepared an inspection report for FENOC, which was utilized to continue the DBNPS inspections. This report included instructions for video inspection, sample collection, cleaning, and re-inspection. As a result of inconclusive sample analysis results of the boric acid deposits, Framatome ANP initiated Preliminary Safety Concern 4-02, which recommended that a bare metal visual examination of the incore instrumentation nozzle/lower RPV head interface area be performed at Babcock &Wilcox fabricated 177-fuel assembly reactor vessels at the earliest opportunity. FENOC and Framatome ANP have developed an inspection plan to determine if the source of the boric acid deposits was leakage through the incore instrumentation nozzles. The inspection plan requires a special 7-day normal operating temperature and pressure test, after which the bottom RPV head incore instrumentation nozzles will be subjected to a repeated 360° bare metal visual examination. In support of this inspection plan, Framatome ANP has conducted laboratory testing for FENOC to establish the sensitivity of the visual inspection to detect very small leaks that would be associated with a cracked weld or nozzle. DBNPS is therefore complying with the Framatome ANP recommendations.

9. **Provide the basis for concluding that the inspections and evaluations described in your responses to the above questions comply with your plant Technical Specifications and Title 10 of the Code of Federal Regulations (10 CFR), Section 50.55(a), which incorporates Section XI of the American Society of Mechanical Engineers (ASME) Code by reference. Specifically, address how your boric acid corrosion control program complies with ASME Section XI, paragraph IWA-5250(b) on corrective actions. Include a description of the procedures used to implement the corrective actions.**

DBNPS RESPONSE

DBNPS Technical Specification LCO 3.4.6.2.a provides limits for RCS leakage and states that there shall be no RCS pressure boundary leakage. Pressure boundary leakage is defined in the Technical Specifications as leakage (except steam generator tube leakage) through a non-isolable fault in a RCS component body, pipe wall or vessel wall. RCS leakage is monitored in accordance with the Technical Specification SR 4.4.6.2.1 surveillance requirements that include monitoring Containment atmosphere gaseous or particulate radioactivity, Containment sump level and flow, and performance of RCS water inventory balance. In addition, FENOC has established a RCS Integrated Leakage Program that monitors leakage and establishes conservative action levels for the conduct of inspections, including corrective actions, to ensure the limits of Technical Specification LCO 3.4.6.2 are not exceeded.

Technical Specification LCO 3.4.10.1 requires the structural integrity of ASME Class 1 components be maintained in accordance with Technical Specification SR 4.4.10.1, which requires certain inspections (reactor coolant pump flywheel and reactor vessel internals vent valves) to be performed in addition to the requirements of Technical Specification SR 4.0.5. Technical Specification SR 4.0.5 requires that the inservice inspection of ASME Code Class 1, 2 and 3 components be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR 50, Section 50.55a. The Section XI Code Edition in effect for the DBNPS is the 1995 Edition through the 1996 Addenda. Nondestructive examinations and system leakage tests of the RCPB are conducted in accordance with the 1995 Edition through the 1996 Addenda of ASME Section XI.

In addition to the system leakage tests required by ASME Section XI, FENOC has established a BACC Program in accordance with NRC Generic Letter 88-05 to ensure that boric acid corrosion does not degrade the RCPB. The BACC Program requires any evidence of boric acid leakage regardless of its discovery method be evaluated in accordance with the DBNPS CAP. The BACC Program also requires the location of the leakage source to be determined and an inspection of affected components or any component in the leakage pathway to determine areas of general corrosion. The BACC Program specifically requires the Condition Report Evaluator to ensure that the requirements of ASME Section XI paragraph IWA-5250(b) (Corrective Action) or ASME Boiler and Pressure Vessel Code Case N-566-1 are addressed as appropriate.

The following inspection procedures have been developed and implemented as portions of the BACC Program:

EN-DP-01500 "Reactor Vessel Inspection Procedure" – This procedure provides guidance when inspecting the Reactor Vessel Head and flange including the 69 CRDM penetrations and flanges, 52 incore guide tube penetrations, two core flood nozzles and two monitoring taps. The corrective actions in this procedure are integrated with those specified in the BACC Program.

EN-DP-01501 "Inspection of RCS Alloy 600 Components/Welds, Threaded/Bolted Connections and Targets." This procedure provides guidance in performing inspections in the Containment building during outages of RCS Alloy 600 components/welds and threaded/bolted joints within the RCPB. The corrective actions in this procedure are integrated with those specified in the BACC Program.

EN-DP-01506 "Borated Water System Inspections (Outside Containment)." This procedure provides guidance in performing inspections of miscellaneous systems outside Containment. The systems within the scope of this procedure contain components that are considered potential sources of borated water leakage outside of Containment based on industry operating experience. The corrective actions are integrated with those specified in the BACC Program.

Table 1

RC Pressure Boundary Alloy 600 Base Material or Alloy 82-182 Weld Material Locations						
Component[(1)]	Inspection Techniques	Personnel Qualifications	Extent of Coverage	Frequency (minimum)	Degree of Insulation Removal/Insulation Type	Corrective Action
Steam Generator Tubes	As required by Technical Specification 3/4.4 5					
Steam Generator Tube Sheet-to-Tube welds	No inspections – welds are internal to Steam Generator					
Steam Generator Tube Sheet Cladding	No inspections – cladding is internal to Steam Generator					
CRDM Nozzle to Flange Weld Quantity 69	Boric Acid Corrosion Control (BACC)	BACC Inspector	100%	Each Refueling Outage	Provide accessibility for 100% inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Access not restricted by insulation / Reflective Mirror	IWB-3522 Acceptance Standards are applicable
	Liquid Penetrant	PT Level II	Examination area is per Figure IWB-2500-18	10% of peripheral CRDM Nozzles each Inservice Inspection Interval	Access not restricted by insulation / Reflective Mirror	IWB-3523 Acceptance Standards are applicable
Reactor Vessel Incore Monitoring Instrument Penetration Quantity 52	BACC	BACC Inspector	100% (external)	Each Refueling Outage	Provide accessibility for 100% external inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Performed per IWA-5242 at lowest level (under vessel)	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable

RC Pressure Boundary Alloy 600 Base Material or Alloy 82-182 Weld Material Locations						
Component[1]	Inspection Techniques	Personnel Qualifications	Extent of Coverage	Frequency (minimum)	Degree of Insulation Removal/Insulation Type	Corrective Action
CRDM Nozzle to - Reactor Vessel Head Penetrations and Welds Quantity 69	BACC	BACC Inspector	100% (external)	Each Refueling Outage	Provide accessibility for 100% external inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Performed per IWA-5242 at lowest level	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3522 Acceptance Standards are applicable
	Bare Metal Visual	VT-2 Level II	100% of the Reactor Pressure Vessel (RPV) Head Nozzle Penetration (including 360° around each RPV head penetration nozzle)	Every Refueling Outage	Insulation not removed Insulation does not restrict access for the examination / Reflective Mirror	Any visual evidence of leakage at the CRDM Nozzle to Head interface requires supplemental ultrasonic and/or eddy current/liquid penetrant examinations to characterize the CRDM Nozzle base material condition
	Ultrasonic	UT Level II	RPV nozzle base material 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	15 RFO, 17 RFO, 19 RFO, 20 RFO, and each refueling thereafter for the existing replacement RPV head	Insulation not removed Insulation does not restrict access for the examination / Reflective Mirror	Acceptance Criteria conforms to recommendations in letter from J Strosnider to A Marion dated November 21, 2001, with exception that flaw growth rate will be calculated in accordance with MRP-55
	Eddy Current or Liquid Penetrant	ET Level II / PT Level II	Wetted surface of each J-groove weld and RPV nozzle base material to at least two (2) inches above the J-groove weld	15 RFO, 17 RFO, 19 RFO, 20 RFO, and each refueling thereafter for the existing replacement RPV head	Insulation not removed Insulation does not restrict access for the examination / Reflective Mirror	

RC Pressure Boundary Alloy 600 Base Material or Alloy 82-182 Weld Material Locations						
Component[(1)]	Inspection Techniques	Personnel Qualifications	Extent of Coverage	Frequency (minimum)	Degree of Insulation Removal/Insulation Type	Corrective Action
Core Flood Safe End to Reactor Vessel Nozzle Welds Quantity 2	BACC	BACC Inspector	100%	Each Refueling Outage	Provide accessibility for 100% inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Performed per IWA-5242 at lowest level (under vessel)	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable
	Volumetric (Automated UT)	UT Level II	Examination is performed from the inside surface. Coverage is limited to approximately 75% of the weld volume	Each Inservice Inspection Interval	Examination is performed from the inside surface. Therefore, access not restricted by insulation / Reflective Mirror	IWB-3514 Acceptance Standards are applicable
Reactor Vessel Gasket Monitor Tap Weld Quantity 2	BACC	BACC Inspector	100%	Each Refueling Outage	Provide accessibility for 100% inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Performed per IWA-5242 at lowest level (under vessel)	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable
Reactor Vessel Internal Guide Lug to Reactor Vessel Shell Attachment Weld Quantity 12	Visual (VT-3)	VT-3 Level II	Accessible Welds	Each Inservice Inspection Interval	No insulation as the Guide Lugs are attached to the Reactor Vessel Interior	IWB-3520.2 Acceptance Standards are applicable

RC Pressure Boundary Alloy 600 Base Material or Alloy 82-182 Weld Material Locations

Component[(1)]	Inspection Techniques	Personnel Qualifications	Extent of Coverage	Frequency (minimum)	Degree of Insulation Removal/Insulation Type	Corrective Action
10" Surge Nozzle to Hot Leg Weld Quantity 1	BACC	BACC Inspector	100%	Each Refueling Outage	Provide accessibility for 100% inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable
	Volumetric (UT) and Surface (PT)	UT Level II PT Level II	Examination area is per Figure IWB-2500-8	Each Inservice Inspection Interval	Insulation removed during examination / Reflective Mirror	IWB-3514 Acceptance Standards are applicable
Hot Leg Pressure Tap Nozzles Quantity 4	BACC	BACC Inspector	100%	Each Refueling Outage	Provide accessibility for 100% inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable

RC Pressure Boundary Alloy 600 Base Material or Alloy 82-182 Weld Material Locations

Component[1]	Inspection Techniques	Personnel Qualifications	Extent of Coverage	Frequency (minimum)	Degree of Insulation Removal/Insulation Type	Corrective Action
Hot Leg Thermowell Mounting Boss Quantity 4	BACC	BACC Inspector	100%	Each Refueling Outage	Provide accessibility for 100% inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable
	Augmented Visual (VT-1)	VT-1 Level II	Hot Leg Pipe to pipe boss weld, the pipe boss, pipe boss to thermowell fillet weld, and thermowell	Each Refueling Outage	Insulation removed / Reflective Mirror	Any evidence of leakage is unacceptable
Decay Heat Nozzle to Hot Leg Weld Quantity 1	BACC	BACC Inspector	100%	Each Refueling Outage	Provide accessibility for 100% inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable
	Volumetric (UT) and Surface (PT)	UT Level II PT Level II	Examination area is per Figure IWB-2500-8	Each Inservice Inspection Interval	Insulation removed during examination / Reflective Mirror	IWB-3514 Acceptance Standards are applicable

RC Pressure Boundary Alloy 600 Base Material or Alloy 82-182 Weld Material Locations

Component[(1)]	Inspection Techniques	Personnel Qualifications	Extent of Coverage	Frequency (minimum)	Degree of Insulation Removal/Insulation Type	Corrective Action
Hot Leg Temperature Connection Quantity 2	BACC	BACC Inspector	100% (external)	Each Refueling Outage	Provide accessibility for 100% external inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable
Hot Leg Vent Nozzle Quantity 2	BACC	BACC Inspector	100%	Each Refueling Outage	Provide accessibility for 100% inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable
Hot Leg Flowmeter Nozzle Quantity 4	BACC	BACC Inspector	100% (external)	Each Refueling Outage	Provide accessibility for 100% external inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable

RC Pressure Boundary Alloy 600 Base Material or Alloy 82-182 Weld Material Locations

Component[1]	Inspection Techniques	Personnel Qualifications	Extent of Coverage	Frequency (minimum)	Degree of Insulation Removal/Insulation Type	Corrective Action
28 " Reactor Coolant Pump Outlet Pipe to Elbow Weld Quantity 4	BACC	BACC Inspector	100%	Each Refueling Outage	Provide accessibility for 100% inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable
	Volumetric (UT) and Surface (PT)	UT Level II PT Level II	Examination area is per Figure IWB-2500-8	Each Inservice Inspection Interval	Insulation removed during examination / Reflective Mirror	IWB-3514 Acceptance Standards are applicable
Hot Leg Level Tap Nozzle Quantity 1	BACC	BACC Inspector	100%	Each Refueling Outage	Provide accessibility for 100% inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable
Cold Leg Temperature Connection Quantity 4	BACC	BACC Inspector	100% (external)	Each Refueling Outage	Provide accessibility for 100% external inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable

RC Pressure Boundary Alloy 600 Base Material or Alloy 82-182 Weld Material Locations						
Component[1]	Inspection Techniques	Personnel Qualifications	Extent of Coverage	Frequency (minimum)	Degree of Insulation Removal/Insulation Type	Corrective Action
Cold Leg Thermowell Nozzles Quantity 4	BACC	BACC Inspector	100%	Each Refueling Outage	Provide accessibility for 100% inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable
	Augmented Visual (VT-1)	VT-1 Level II	Hot Leg Pipe to pipe boss weld, the pipe boss, pipe boss to thermowell fillet weld, and thermowell	Each Refueling Outage	Insulation removed / Reflective Mirror	Any evidence of leakage is unacceptable
28" Pipe to Reactor Coolant Pump Inlet Weld Quantity 4	BACC	BACC Inspector	100%	Each Refueling Outage	Provide accessibility for 100% inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable
	Volumetric (UT) and Surface (PT)	UT Level II PT Level II	Examination area is per Figure IWB-2500-8	Each Inservice Inspection Interval	Insulation removed during examination / Reflective Mirror	IWB-3514 Acceptance Standards are applicable

RC Pressure Boundary Alloy 600 Base Material or Alloy 82-182 Weld Material Locations

Component[1]	Inspection Techniques	Personnel Qualifications	Extent of Coverage	Frequency (minimum)	Degree of Insulation Removal/Insulation Type	Corrective Action
Cold Leg Drain Nozzle to Elbow Welds Quantity 4	BACC	BACC Inspector	100%	Each Refueling Outage	Provide accessibility for 100% inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable
	Surface (PT) and Augmented Volumetric (UT)	UT Level II PT Level II	Examination area is per Figure IWB-2500-8	Each Inservice Inspection Interval	Insulation removed during examination / Reflective Mirror	IWB-3514 Acceptance Standards are applicable
High Pressure Injection Nozzle Safe End Weld Quantity 4	BACC	BACC Inspector	100%	Each Refueling Outage	Provide accessibility for 100% inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable
	Augmented Volumetric (UT) and Augmented Surface (PT)	UT Level II PT Level II	Examination area is per Figure IWB-2500-8	Each Inservice Inspection Interval	Insulation removed during examination / Reflective Mirror	IWB-3514 Acceptance Standards are applicable
Cold Leg Nozzle Dam Attachment to the Steam Generator Quantity 4	No Inspection – Attachments are internal to the Steam Generator lower head					

RC Pressure Boundary Alloy 600 Base Material or Alloy 82-182 Weld Material Locations

Component[1]	Inspection Techniques	Personnel Qualifications	Extent of Coverage	Frequency (minimum)	Degree of Insulation Removal/Insulation Type	Corrective Action
Pressurizer Spray Nozzle Safe-End Weld Quantity 1	BACC	BACC Inspector	100%	Each Refueling Outage	Provide accessibility for 100% inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable
	Volumetric (UT) and Surface (PT)	UT Level II PT Level II	Examination area is per Figure IWB-2500-8	Each Inservice Inspection Interval	Insulation removed during examination / Reflective Mirror	IWB-3514 Acceptance Standards are applicable
Pressurizer Spray Nozzle Extension Pin Quantity 1	No Inspection – Attachments are internal to the Pressurizer					
Pressurizer Level Tap Nozzle Quantity 6	BACC	BACC Inspector	100% (external)	Each Refueling Outage	Provide accessibility for 100% external inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable

RC Pressure Boundary Alloy 600 Base Material or Alloy 82-182 Weld Material Locations						
Component[(1)]	Inspection Techniques	Personnel Qualifications	Extent of Coverage	Frequency (minimum)	Degree of Insulation Removal/Insulation Type	Corrective Action
Pressurizer Thermowell Nozzle	BACC	BACC Inspector	100% (external)	Each Refueling Outage	Provide accessibility for 100% external inspection / Reflective Mirror	Visual inspection for extent of condition
Quantity 1	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable
10" Pressurizer Surge Line Nozzle Weld	BACC	BACC Inspector	100%	Mid cycle shutdown (2004) and every refueling	Provide accessibility for 100% inspection / Reflective Mirror	Visual inspection for extent of condition
Quantity 1	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable
	Volumetric (UT) and Surface (PT)	UT Level II PT Level II	Examination area is per Figure IWB-2500-8	Each Inservice Inspection Interval	Insulation removed during examination / Reflective Mirror	IWB-3514 Acceptance Standards are applicable
Steam Generator Primary Drain Nozzles	BACC	BACC Inspector	100% (external)	Each Refueling Outage	Provide accessibility for 100% external inspection / Reflective Mirror	Visual inspection for extent of condition
Quantity 2	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable

RC Pressure Boundary Alloy 600 Base Material or Alloy 82-182 Weld Material Locations

Component[1]	Inspection Techniques	Personnel Qualifications	Extent of Coverage	Frequency (minimum)	Degree of Insulation Removal/Insulation Type	Corrective Action
Pressure Relief Nozzle Weld Quantity 3	BACC	BACC Inspector	100%	Each Refueling Outage	Provide accessibility for 100% inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable
	Surface (PT)	PT Level II	Examination area is per Figure IWB-2500-8	Each Inservice Inspection Interval	Insulation removed during examination / Reflective Mirror	IWB-3514 Acceptance Standards are applicable
Pressurizer Sample Tap Nozzle Quantity 1	BACC	BACC Inspector	100% (external)	Each Refueling Outage	Provide accessibility for 100% exxternal inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable
Pressurizer Vent Nozzle Quantity 1	BACC	BACC Inspector	100% (external)	Each Refueling Outage	Provide accessibility for 100% external inspection / Reflective Mirror	Visual inspection for extent of condition
	Visual (VT-2)	VT-2 Level II	Pressure retaining boundary per Examination Category B-P – Examination is performed per IWA-5240	Prior to plant startup following each Refueling Outage during Mode 3 at Normal Operating Pressure (NOP)	Insulation not removed during examination / Reflective Mirror	IWB-3523 Acceptance Standards are applicable

(1) Alloy 82-182 weld material locations associated with Alloy 600 base material components are not separately listed. VT-2 inspection of these components also detects through-weld leakage.

COMMITMENT LIST

The following list identifies those actions committed to by the Davis-Besse Nuclear Power Station, Unit Number 1, (DBNPS) in this document. Any other actions discussed in the submittal represent intended or planned actions by the DBNPS. They are described only for information and are not regulatory commitments. Please notify the Manager – Regulatory Affairs (419-321-8450) at the DBNPS of any questions regarding this document or associated regulatory commitments.

COMMITMENTS	DUE DATE
A bare metal visual examination of 100% of the RPV head surface (including 360° around each RPV head penetration nozzle) shall be performed.	Every Refueling Outage (letter Serial Number 2804 & 2837)
Ultrasonic Testing (UT) of each RPV head penetration nozzle (i.e., nozzle base material) 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 shall be performed.	15 RFO, 17 RFO, 19 RFO, 20 RFO, and each refueling thereafter for the existing replacement RPV head (letter Serial Number 2804 & 2837)
Eddy current testing or dye penetrant testing of the wetted surface of each J-groove weld and RPV head penetration nozzle base material to at least two (2) inches above the J-groove weld shall be performed.	15 RFO, 17 RFO, 19 RFO, 20 RFO, and each refueling thereafter for the existing replacement RPV head (letter Serial Number 2804 & 2837)
Visual inspections shall be performed to identify potential boric acid leaks from pressure-retaining components above the RPV head. For boron deposits on the surface of the RPV head or related insulation, discovered either during the inspections required by the February 11, 2003, Order or otherwise and regardless of the source of the deposit, before returning the plant to operation perform inspections of the affected RPV head surface and penetrations appropriate to the conditions found to verify the integrity of the affected area and penetrations.	Every Refueling Outage (letter Serial Number 2837)

(continued)

COMMITMENTS	DUE DATE
(continued)	
For each inspection required in Paragraph C of the February 11, 2003, Order, the Licensee shall submit a report detailing the inspection results within sixty (60) days after returning the plant to operation. For each inspection required in Paragraph D of the Order, the Licensee shall submit a report detailing the inspection results within sixty (60) days after returning the plant to operation if a leak or boron deposit was found during the inspection. This reporting requirement supercedes the 30-day reports requested by NRC Bulletin 2002-02.	Within sixty (60) days after returning the plant to operation following the applicable outage (letter Serial Number 2837)
Acceptance Criteria will conform to the recommendations provided in the letter from Mr. Jack Strosnider, Director, Division of Engineering, Office of Nuclear Reactor Regulation, NRC, to Mr. Alex Marion, Director Engineering, Nuclear Energy Institute, dated November 21, 2001, with the exception that flaw growth rate will be calculated in accordance with the guidance provided by MRP-55, " Materials Reliability Program (MRP) Crack Growth Rates for Evaluating Primary Water Stress Corrosion Cracking (PWSCC) of Thick-Wall Alloy 600 Material."	At the time of inspection (letter Serial Number 2804 & 2837)
Personnel and procedures will be qualified in accordance with the applicable sections of ASME Code Section V, "Nondestructive Examination," and XI, "Rules for Inservice Inspection of Nuclear Power Plant Components." The visual qualification requirements will be in accordance with the requirements of the most recent revision of EPRI Technical Report 1006899, "Visual Examination for Leakage of PWR Reactor Head Penetrations on Top of RPV Head."	Prior to inspection in 14 RFO (letter Serial Number 2804 & 2837)

DAVIS-BESSE NUCLEAR POWER STATION, UNIT NUMBER 1,

15-DAY RESPONSE TO BULLETIN 2002-01, "REACTOR PRESSURE VESSEL HEAD DEGRADATION AND REACTOR COOLANT PRESSURE BOUNDARY INTEGRITY," 60-DAY RESPONSE TO BULLETIN 2002-01, AND RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING THE 60-DAY RESPONSE TO BULLETIN 2002-01

This letter and associated attachments are submitted pursuant to 10 CFR 50.54(f) and contain information pursuant to Bulletin 2002-01, dated March 18, 2002, and the Request for Additional Information, dated January 7, 2003, related to the Bulletin 2002-01 60-day response. The statements contained in this submittal are true and correct to the best of my knowledge, information and belief.

I declare under penalty of perjury that the foregoing is true and correct. Executed on March 31, 2003.

Lew W. Myers

Lew W. Myers, Chief Operating Officer