Categories for Requests for Additional Information Re: Bulletin 2002-01

BIN 1 PLANTS

Arkansas Nuclear One Units 1 & 2

North Anna Units 1 & 2

Surry Units 1 & 2

Waterford Unit 3 - **Question 1:** Clarify whether or not the bottom of the reactor pressure vessel (RPV) head is inspected. If the bottom of the RPV head is inspected, provide detailed information on the inspection techniques and the basis for the chosen techniques, scope and frequency of inspections, personnel qualifications, and degree of insulation removal for the examination. If not, provide the technical basis for not performing the inspection. **Note: The RAIs in the attachment for Bin 1 plants become questions 2 and 3 for Waterford 3.**

BIN 2 PLANTS

Beaver Valley Units 1 & 2
Braidwood Units 1 & 2
Byron Units 1 & 2
Callaway
Calvert Cliffs Units 1 & 2
Catawba Units 1 & 2
Comanche Peak Units 1 & 2
Crystal River Unit 3
D.C. Cook Units 1 & 2
Diablo Canyon Units 1 & 2
Farley Units 1 & 2
Fort Calhoun
Ginna
Indian Point Units 2 & 3
Kewaunee
McGuire Units 1 & 2
Millstone Units 2 & 3
Oconee Units 1, 2, & 3
Palisades
Palo Verde Units 1, 2, & 3
Point Beach Units 1 & 2
Prairie Island Units 1 & 2
Robinson Unit 2
Salem Units 1 & 2
San Onofre Units 2 & 3
Seabrook
Sequoyah Units 1 & 2
Shearon Harris
South Texas Project Units 1 & 2
St. Lucie Units 1 & 2
TMI Unit 1
Turkey Point Units 3 & 4
V.C. Summer
Vogtle Units 1 & 2
Watts Bar Unit 1
Wolf Creek

Licensing Contact **Model Cover Letter for RAIs**
Utility
Address

SUBJECT: BULLETIN 2002-01, "REACTOR PRESSURE VESSEL HEAD DEGRADATION AND REACTOR COOLANT PRESSURE BOUNDARY INTEGRITY," 60-DAY RESPONSE FOR **PLANT(S) [FILL IN THE APPLICABLE UNIT(S)]** REQUEST FOR ADDITIONAL INFORMATION (TAC NO(S). MXXXXX)

On March 18, 2002, the Nuclear Regulatory Commission (NRC) issued Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity," to all holders of operating licenses for pressurized water reactors (PWRs). Within 60 days of the date of this bulletin, all PWR addressees were required to submit to the NRC the following information related to the reactor coolant pressure boundary (RCPB) other than the reactor pressure vessel (RPV) head:

> 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.

The staff has evaluated licensees' 60 day responses to Bulletin 2002-01 concerning the rest of the RCPB. The staff concluded that most of the licensees' 60 day responses lacked specificity. Therefore the staff could not complete its review of the boric acid corrosion control (BACC) programs in light of the lessons learned from the Davis-Besse event. The information request in Bulletin 2002-01 may not have been sufficiently focused, which, in part, may explain the lack of clarity in the licensees' 60 day responses. The staff's review of all licensees' 60 day responses provided the basis for development of the questions in this request for additional information (RAI). Licensees are expected to provide responses in sufficient details to facilitate a comprehensive staff review of their BACC programs.

The NRC is not imposing new requirements through the issuance of Bulletin 2002-01 or this RAI. The staff's review of the information collected will be used as part of the decision-making process regarding possible changes to the NRC's regulation and inspection of BACC programs. The NRC staff has, however, concluded that a comprehensive BACC program would exceed the current American Society of Mechanical Engineers (ASME) Code requirements; and would include, but is not limited to, the following:

1. The BACC program must address, in detail, the scope, extent of coverage, degree of insulation removal, and frequency of examination for materials susceptible to boric acid corrosion. The BACC program would also ensure that any boric acid leakage is identified before significant degradation occurs which may challenge structural integrity.

    a. The scope should include all components susceptible to boric acid corrosion (BAC) and identify the type of inspections performed, e.g. VT-2 or VT-3 examination.

    b. The technical basis for any deviations from inspection of susceptible materials and mechanical joints must be clearly documented.

c. As stated in Generic Letter 88-05, the BACC program should identify the principal locations where leaks that are smaller than the allowable technical specification limit have the potential to 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 surface or locations that are susceptible to primary water stress corrosion cracking (Alloy 600 base metal and dissimilar metal Alloy 82/182 welds) or susceptible to leakage (e.g. valve packing, flange gaskets).

d. For inaccessible components (e.g. buried components, components within rooms, vaults etc.) the degree of inaccessibility, and the type of inspection that would be effective for examination of the area must be clearly defined. In addition, identify any leakage detection systems that are being used to detect potential leakage from components in inaccessible areas.

e. The technical basis for the frequency of implementing the BACC program must be clearly documented.

2. The examiners would be VT-2 qualified at a minimum, and would be trained to recognize that very small volumes of boric acid leakage could be indicative of significant corrosion.

3. The BACC program would ensure that any boric acid leakage is identified before significant degradation occurs which may challenge structural integrity. If observed leakage from mechanical joints is not determined to be acceptable, the appropriate corrective actions must be taken to ensure structural integrity. Evaluation criteria and procedures for structural integrity assessments must be specified. The applicable acceptance standards and their bases must also be identified.

4. Leakage from mechanical joints (e.g., bolted connections) that is determined to be acceptable for continued operation must be inspected and monitored in order to trend/evaluate changes in leakage. The bases for acceptability must be documented. Any evaluation for continued service should include consideration of corrosion mechanisms and corrosion rates. If boric acid residues are detected on components, the leakage source shall be located by removal of insulation, as necessary. Identification of the type of insulation and any limitations concerning its removal should be addressed in the BACC program.

5. Leakage identified outside of inspections for BAC should be integrated into the BACC program.

6. Licensees would routinely review and update the BACC program in light of plant specific and industry experience, monitoring and trending of past leakage, and proper documentation of boric acid evaluations to aid in determination of recurring conditions and root cause of leakage. New industry information should be integrated in a consistent manner such that revised procedures are clear and concise.

Please consider the above attributes in providing your responses to the RAI. The RAI is attached.

This request was discussed with **[Name]** of your staff on **[Date]**, and it was agreed that a response would be provided within **[30]** days of receipt of this letter.

If you have any questions, please contact me at **[Phone Number]**.

Sincerely,

[Name], Project Manager, Section **[fill in Section No.]**
Project Directorate ***[fill PD number]***
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

RAI for Plants Categorized in Bin 1

REQUEST FOR ADDITIONAL INFORMATION

REGARDING BORIC ACID CORROSION CONTROL PROGRAMS

[PLANT UNIT(S)]

DOCKET NO(S). [FILL IN NUMBER]

1. 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.

2. Discuss 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.

RAI for Plants Categorized in Bin 2

REQUEST FOR ADDITIONAL INFORMATION

REGARDING BORIC ACID CORROSION CONTROL PROGRAMS

[PLANT UNIT(S)]

DOCKET NO(S). [FILL IN NUMBER]

The format provided in Table A may be used to respond to the following RAIs:

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 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., RPV bottom head).

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.

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.

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, and the acceptance criteria established to make such a determination. Provide the technical basis used to establish the acceptance criteria.

    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.

    B. If observed leakage is not determined to be acceptable, describe what corrective actions are taken to address the leakage.

5. Explain how your program evaluates evidence of low levels of RCPB leakage that may not be detectable by installed leakage detection instrumentation, but has the potential for causing boric acid corrosion. In addition, explain how your program addresses leakage that may impact components that are in the leak path.

6. 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 10 CFR 50.55(a) which incorporates Section XI of the ASME Code by reference. Specifically, address how your BACC 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.

Table A. Template for Response to RAIs

Component	Inspection Techniques	Personnel Qualifications	Extent of Coverage	Frequency	Degree of Insulation Removal/Insulation Type	Corrective Action