

November 14, 2002

Mr. Harold B. Ray  
Executive Vice President  
Southern California Edison Company  
San Onofre Nuclear Generating Station  
P.O. Box 128  
San Clemente, CA 92674-0128

SUBJECT: BULLETIN 2002-01, "REACTOR PRESSURE VESSEL HEAD DEGRADATION AND REACTOR COOLANT PRESSURE BOUNDARY INTEGRITY," 60-DAY RESPONSE FOR SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2 AND 3 REQUEST FOR ADDITIONAL INFORMATION (TAC NOS. MB4575 AND MB4576)

Dear Mr. Ray:

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 NRC staff has evaluated the licensees' 60-day responses to Bulletin 2002-01 concerning the rest of the RCPB and concluded that most of the licensees' 60-day responses lacked specificity. Therefore, the NRC 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 NRC staff's review of the 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 detail 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 NRC staff's review of the information collected will be used as part of the decisionmaking 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 that may challenge structural integrity.
  - a. The scope should include all components susceptible to boric acid corrosion (BAC) and identify the type of inspection(s) 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, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants," 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 that 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.

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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 enclosed.

This request was discussed with Mr. Jack Rainsberry of your staff on November 12, 2002, and it was agreed that a response would be provided within 60 days of receipt of this letter.

If you have any questions, please contact me at 301-415-8450.

Sincerely,

*/RA/*

Bo M. Pham, Project Manager, Section 2  
Project Directorate IV  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-361 and 50-362

Enclosure: Request for Additional Information

cc w/encl: See next page





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if observed leakage is not d

in leakage, or  
describe what inspection/m  
if observed leakage is dete

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with the observed le  
mechanical joints (e  
Describe the evalua

to detect potential le  
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coolant leaks have t  
boundary (RCPB).  
and dissimilar meta  
degree of insulation  
scope, extent of cov  
Provide detailed info

The format p

DOCKET NO(S). 50-361 and 50-362

SAN ONOFRE NUCLEAR

REGARDING BORIC ACID

REQUEST FOR ADDITIONAL INFO

Action/rective	Type and/or location of instrumentation	Frequency	Color/angle of	Questions/notes	Termination	Component

Table A. Template for Response to RAIs

a description of the component that does not comply with ASME B31.1 by reference. Specific requirements are incorporated in Section 50.55(a) of the Code of Federal Regulations (10 CFR), which provides the basis for responses to the above RAIs.

are not followed. The licensee will take corrective action regarding vendor selection and inspection of nozzle welds. Provide a summary of the corrective action.

models or consequences of low levels of leakage. Explain how any as-built conditions may affect the results.

components that are not included in the instance. In addition, describe how your pressure detection instrumentation may call into question the integrity of components and components of the pressure boundary. Explain the capabilities of the instrumentation.

addresses leakage detection evidence of possible degradation of the bottom boundary instrumentation nozzle. NRC has had a concern regarding the detection instrumentation may call into question the integrity of the reactor pressure vessel pressure boundary. Explain the capabilities of the instrumentation.