Nuclear Operating Company
South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

May 16, 2002
NOC-AE-02001317

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
60 Day Response to NRC Bulletin 2002-01,
"Reactor Pressure Vessel Head Degradation
and Reactor Coolant Pressure Boundary Integrity"

In accordance with 10CFR50.54(f), attached is the STP Nuclear Operating Company (STPNOC) 60 day response to U.S. Nuclear Regulatory Commission (NRC) Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity" dated March 18, 2002. This response addresses the STP boron inspection program and fulfills a STPNOC commitment in the original bulletin response to apprise the NRC regarding plans to inspect the STP reactor vessel heads.

STPNOC coordinated preparation of this response with the other participants in the Strategic Teaming and Resource Sharing (STARS) group.

Licensing commitments are identified in Attachment 2 to this letter. If you should have any questions regarding this submittal, please contact me at 361-972-8757 or Mr. Michael Lashley at 361-972-7523.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on: 5/16/02

J. J. Sheppard
Vice President,
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RDP
Attachments:
1. Response to Bulletin 2002-01
2. List of Commitments

A095

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60 Day Response to NRC Bulletin 2002-01
Reactor Pressure Vessel Degradation and Reactor Coolant Pressure Boundary Integrity

Below is the STP Nuclear Operating Company (STPNOC) 60 day response to Nuclear Regulatory Commission (NRC) Bulletin 2002-01, Reactor Pressure Vessel Degradation and Reactor Coolant Pressure Boundary Integrity, dated March 18, 2002. The Bulletin's "Required Information" is shown in **bold**.

NRC Requirement:

Required Information

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

    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.**

STP Response:

As described in STP letter NOC-AE-02001290, "Response to NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity" dated April 2, 2002 (15-day response), the STP boric acid inspection program is an integral part of STP's approach in demonstrating compliance with the applicable regulatory requirements to assure reactor coolant pressure boundary integrity. Other elements for assuring compliance are described in the 15-day response.

Program Definition

In response to Generic Letter 88-05, STPNOC established a program for locating, evaluating and preventing boric acid corrosion of the primary pressure boundary. This program was established prior to commercial operation of both STP units. It applies to reactor coolant pressure boundary (RCPB) components (as defined in 10CFR50.2) that are susceptible to boric acid corrosion. Program requirements are governed by procedure 0PGP03-ZE-0033, "RCS Pressure Boundary Inspection for Boric Acid Leaks".

The program includes but is not limited to the following:

- Inspection of the principal locations where leaks that are smaller than the allowable technical specification limit can cause degradation of the RCPB by boric acid corrosion - Particular consideration is given to inspecting locations where conditions exist that could cause high

concentrations of boric acid on pressure boundary surfaces, and on RCPB components with carbon steel subcomponents that may come in contact with boric acid.

- Identification of the procedures for monitoring small coolant leaks (leakage rates at less than Technical Specifications limits) - The importance of establishing the potential path of leaking coolant and the RCPB component(s) that the leakage would likely contact is recognized.
- Methods for conducting examinations and performing engineering evaluations to establish the impact on the RCPB when leakage is located - The intent is to promptly gather the necessary information for an engineering evaluation before the removal of evidence of leakage, such as boric acid crystal buildup.
- Implementation of corrective actions to prevent recurrence of boric acid corrosion - Corrective actions may include 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 coating/claddings.
- Maintenance of auditable records including the results obtained from the implementation of this program

By application of this program, STPNOC minimizes boric acid-induced corrosion through: (1) early detection of boric acid leaks by means of inspections and leakage monitoring programs; (2) thorough inspection of the areas surrounding identified boric acid leakage; (3) proper evaluation of areas where leakage has occurred; and (4) prompt action to mitigate the leak, perform repairs, and prevent future leaks or impairment.

Other applicable regulatory requirements are verified during the performance of inservice inspections and the system leakage tests required by ASME Section XI for the Code Class 1 pressure boundary.

Inspection Scope and Frequency

The walkdowns required under the boric acid corrosion control program are performed by selected engineering personnel. The objective is to identify boric acid leakage from any source inside containment with particular emphasis on locations where boric acid corrosion of low alloy and carbon steel RCPB components may occur. A listing of RCPB components that are susceptible to boric acid corrosion is maintained in the station procedure governing the boric acid corrosion control program. During walkdowns, these components are inspected to determine if any impairment due to boric acid leakage has occurred or may occur based on leak characteristics. Inspection results are retained and reviewed to identify trends of repeat leak occurrences.

The walkdowns are performed during each plant outage unless an inspection was performed within the last 90 days. Inspections generally commence early in the outage to ensure timely inspections prior to the potential upset of boric acid leakage evidence by outage support activities. Operations department personnel are procedurally restricted from cleaning up boric acid residue until after an evaluation has been performed by Engineering.

Obstructions to Visual Observations

During program walkdowns, insulation is displaced on listed program components, as necessary, to expose potentially leaking joints. One exception is the head insulation, which is not normally removed to inspect for leakage from the head penetration welded joints. The reactor vessel head penetration joints, which are above the head insulation, are inspected. Reactor vessel stud insulation is removed exposing the lower head areas to facilitate detection of gross penetration leakage. Removal of insulation to locate and properly characterize leak sources is the standard STPNOC process.

As allowed by the ASME Code and approved code cases, insulation is not necessarily removed during the ASME-required system leakage test.

Training

Personnel performing boric acid walkdowns are selected by the program owner based on their knowledge of primary plant equipment and an understanding of the corrosive effect of boric acid. They are trained on program requirements including inspection acceptance criteria and evaluation methodology. Relevant industry experience is reviewed as part of this training.

Response to Leakage

Boric acid leakage is documented and tracked in the site corrective action database to ensure timely evaluation and corrective action. Corrective actions include cleaning the area to ascertain the leak source, temporary or permanent repair of the leaking component and repair of adjacent damaged components. Engineering evaluations are conducted to assess effects on components when degradation is present. Inspection and evaluation guidelines are provided in the boric acid leak inspection governing procedure.

After appropriate evaluations are complete, boric acid residue is removed from susceptible material of RCPB components.

Components are considered acceptable if they are free from evidence of leakage or if surfaces exposed to leakage have been evaluated to ensure the leakage has no adverse impact on continued operation.

Review of Program Effectiveness

Boric acid corrosion events reported at other plants are evaluated as part of the STP operating experience review program. Where applicable, that experience is factored into the boric acid leakage program to prevent similar events from occurring.

In implementing the boric acid leakage program, steps are taken to minimize the potential for boric acid corrosion and to improve the boric acid leakage identification process. To date, minimal degradation of RCPB material has been observed at STPNOC due to boric acid corrosion. Degraded components have been generally limited to carbon-steel valve yokes and

low-alloy steel bolting on components such as steam generator manways and valves. The minimal material loss experienced in these cases did not affect the functionality of these components.

Conclusion

The STPNOC boric acid inspection program is an effective element in maintaining reactor coolant pressure boundary integrity, which assures compliance with the applicable regulatory requirements discussed in GL 88-05 and Bulletin 2002-01.

NRC Requirement:

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, and

STP Response:

In the original response to Bulletin 2002-01, STPNOC committed to continue to monitor developments and industry experience on this issue and apprise the NRC of inspection plans in the 60 day response to this Bulletin.

STPNOC is currently planning to perform a remote visual inspection of the bare metal upper head of both reactor vessels during the next refueling outage in each unit. The Unit 2 reactor vessel head inspection is expected to occur during the fall 2002 Steam Generator Replacement Outage and the Unit 1 inspection is expected to occur during the spring 2003 Refueling Outage. These inspections will be performed to support an engineering evaluation of the condition of the reactor vessel heads with regard to the issues addressed in NRC Bulletin 2002-01.

Inspection Method

The visual inspections under the insulation will be via video camera delivered either manually or by a remotely-controlled crawler. Less accessible areas may be inspected via other video equipment.

Personnel Qualifications

An evaluation team composed of personnel qualified at a minimum as VT-2 Level II and cognizant engineering staff will evaluate the results of the visual inspection.

Inspection System Qualification

The tools and techniques employed for the inspections will meet the standards of the ASME B&PV Code, Section XI, 1989 edition, IWA-2210 for VT-2 examinations with respect to resolution capabilities and lighting.

Scope

The inspections will be performed on a best-effort basis with a goal of 100% coverage of the reactor vessel head under the insulation, but as a minimum sufficient to support an engineering evaluation of the condition of the vessel head outer surface.

Acceptance Criteria

Accumulations of boric acid residue found on the reactor vessel head will be investigated sufficiently to determine their origin. Discolored surfaces or areas with boric acid build-up will be given particular attention to determine, to the extent possible with visual examination equipment, if the surface below the residue is sound. If necessary, supplemental investigation aids such as scrapers, brushes, compressed air and water washing will be applied to suspect areas to assist in the resolution of these areas.

Boric acid residue whose source is determined to originate in the juncture annulus of a head penetration tube and the head will be cause for immediate in-depth investigation to determine the severity of the defect.

Boric acid residue from sources other than a penetration tube juncture will be investigated and corrective measures will be taken regarding the termination of the leak source and the arrest of any corrosive attack on the head.

Frequency

Any inspections beyond those currently planned will be based on STPNOC inspection results, industry experience and EPRI PWR Materials Reliability Program guidance.

LIST OF COMMITMENTS

The following table identifies those actions committed to by STP in this document. Any other statements in this submittal are provided for information purposes and are not considered to be commitments. Please direct questions regarding these commitments to Mr. Wayne Harrison at 361-972-7298.

COMMITMENT	Due Date/Event
STPNOC will perform a remote visual inspection of the bare metal upper head of both reactor vessels on a best-effort basis during the next refueling outage in each unit. The Unit 2 reactor vessel head inspection is scheduled for the fall 2002 Steam Generator Replacement Outage and the Unit 1 inspection is scheduled for the spring 2003 Refueling Outage.	Next refueling outage (Units 1 & 2).