



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

December 23, 2002
NOC-AE-02001437
STI: 31532288

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
STP Unit 2 Reactor Pressure Vessel Head Inspection Results
In Response to Bulletin 2001-01, Bulletin 2002-01 and Bulletin 2002-02

References:

1. Letter from J. J. Sheppard to the Document Control Desk dated August 29, 2001, Response to NRC Bulletin 2001-01, "Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles" (NOC-AE-01001163)
2. Letter from J. J. Sheppard to the Document Control Desk dated April 2, 2002, Response to NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity" (NOC-AE-02001290)
3. Letter from T. J. Jordan to the Document Control Desk dated September 11, 2002, 30 Day Response to NRC Bulletin 2002-02, "Reactor Pressure Vessel Head and Vessel Head Penetration Nozzle Inspection Programs" (NOC-AE-02001386)
4. Letter from J. J. Sheppard to the Document Control Desk dated May 16, 2002, 60 Day Response to NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity" (NOC-AE-02001317)

In Reference 1, STPNOC committed to provide the NRC with the following information within 30 days after plant restart following the next refueling outage.

- A. A description of the extent of vessel head penetration (VHP) nozzle leakage and cracking detected at your plant, including the number, location, size, and nature of each crack detected;

A088
A095
A096

- B. If cracking is identified, a description of the inspections (type, scope, qualification requirements, and acceptance criteria) repairs, and other corrective actions you have taken to satisfy applicable regulatory requirements. This information is requested only if there are any changes from prior information submitted in accordance with this bulletin.

In Reference 2, STPNOC committed to provide the NRC with the following information within 30 days after plant restart following the next inspection of the reactor pressure vessel head to identify any degradation:

- A. The inspection scope (if different than that provided in response to Item 1.D.) and results, including the location, size, and nature of any degradation detected,
- B. The corrective actions taken and the root cause of the degradation.

In Reference 3, STPNOC committed to provide the NRC with the following information within 30 days after plant restart following the next inspection of the RPV head and VHP nozzles to identify the presence of any degradation:

- A. The inspection scope and results, including the location, size, extent, and nature of any degradation (e.g., cracking, leakage, and wastage) that was detected; details of the NDE used (i.e., method, number, type, and frequency of transducers or transducer packages, essential variables, equipment, procedure and personnel qualification requirements, including personnel pass/fail criteria); and criteria used to determine whether an indication, "shadow," or "backwall anomaly" is acceptable or rejectable.
- B. The corrective actions taken and the root cause determinations for any degradation found.

STPNOC completed the Unit 2 Steam Generator Replacement Outage (2RE09) on December 6, 2002. As committed in the responses to NRC Bulletins 2001-01, 2002-01 and 2002-02, STPNOC submits the information below describing the results of the STP Unit 2 reactor pressure vessel (RPV) head inspection.

STPNOC performed a bare metal visual (BMV) of the head as described in MRP-75. The inspection was performed with a robot that had a front and back camera with lights, augmented with a boroscope. The robot was a collaborative STARS¹ purchase specifically for this type inspection.

The scope of the inspection was as described in STPNOC's response to Bulletin 2002-01, Item 1.D (see Reference 4) and is attached for the reviewers' convenience.

¹ STARS consists of six plants operated by STP Nuclear Operating Company, TXU Generation Company LP, AmerenUE, Wolf Creek Nuclear Operating Corporation, Pacific Gas and Electric Company, and Arizona Public Service Company.

STPNOC was able to view all the reactor head penetrations with a combination of the robot and boroscope. There were no relevant indications. No cracking, leakage, or wastage was found. All inspections were videotaped.

Four areas on the head had residual deposits:


1. A current intermediate canopy seal leak on a control rod drive mechanism at Penetration 7.
2. An area on the head between control rod drive mechanism Penetrations 3 and 7. The source of this residue was the canopy seal leak described in item 1.
3. A previous core exit thermocouple conoseal leak (CET Penetration 75 described in Reference 2), and
4. A previous reactor vessel water level column mechanical joint (RVWL Penetration 26 described in Reference 2).

Items 3 and 4 were reported in Reference 2 to have been cleaned. It is believed that the improved inspection technique using the robot and boroscope found residue that had been previously missed after these leakage sources were repaired. These areas in addition to the areas described in items 1 and 2 were cleaned with low pressure demineralized water during 2RE09 and reinspected to ensure no degradation had occurred and to facilitate future inspections.

If you should have any questions regarding this submittal, please contact me at 361-972-7902 or Mr. Michael Lashley at 361-972-7523.

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

Executed on: Dec. 23, 2002


T. J. Jordan
Vice President,
Nuclear Engineering and
Technical Services

AWH

Attachment: Description of Inspection

cc:
(paper copy)

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Description of Inspection

NRC Requested Information from Bulletin 2002-01:

- 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.