

May 29, 2002

MEMORANDUM TO: Robert A. Gramm, Chief, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

FROM: Thomas W. Alexion, Project Manager, Section 1
Project Directorate IV */RA/*
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF THREE APRIL 2002 CONFERENCE CALLS WITH THE
LICENSEE ON THE REACTOR PRESSURE VESSEL HEAD
INSPECTION PLANS AND RESULTS AT ARKANSAS UNIT ONE,
UNITS 1 AND 2 (ANO-1&2) (TAC NOS. MB4524 AND MB4525)

During the month of April 2002, the NRC staff and the licensee had three conference calls on the licensee's reactor pressure vessel head inspection plans and results. A summary of each of those calls follows.

April 17, 2002, Conference Call

Due to questions from the Region IV inspectors on the process used by the licensee to demonstrate the surface or volumetric examination method at ANO-2, the licensee agreed to provide a demonstration report (with a summary) within 30 days after restart. This demonstration report will include a road map and supporting documentation to characterize the nondestructive examination (NDE) demonstration activities and results.

April 19, 2002, Conference Call

Due to questions from the Region IV inspectors on the need for eddy-current (EC) examinations in addition to ultrasonic testing (UT) examinations at ANO-2, the licensee repeated their commitment in response to Bulletin 2002-01 ("Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity"), that they will perform inspections in accordance with Generic Letter (GL) 88-05 ("Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants") (visual), and under the head volumetric examinations of 100 percent of the vessel head penetrations. The licensee indicated that the UT examinations are capable of detecting a leak path, and that limited EC examinations were only being relied upon for characterizing the length of any flaws that are detected by UT examinations. The licensee assured the NRC staff that the UT examinations will be able to detect all significant indications and that the basis for this assertion will be provided in their demonstration report, which will be provided within 30 days after restart. The licensee confirmed that ANO-2 has not experienced any conoseal leaks or any other leaks from external sources that would leave boric acid on top of the head. The licensee concluded that

the absence of prior leakage, combined with the capability of the UT examinations to determine through-wall cracks, addresses the Bulletin 2002-01 concern of reactor pressure vessel head degradation. The licensee was not aware of information that the regional inspector obtained regarding apparent indications on two control element drive mechanism (CEDM) nozzles; however, the licensee agreed to follow-up on the information.

April 25, 2002, Conference Call

On April 25, 2002, the licensee provided the attached Reactor Pressure Vessel Head Inspection Summary for 2R15, which consists of the inspection plan, the inspection results, the follow-up actions, and three figures. The licensee also indicated that they inspected the head flange and performed GL 88-05 visual inspections (from the top of the head to the head flange). The licensee performed UT examinations of all vessel head penetrations, and some penetrations received EC examinations. Due to indications from the UT examination results, the licensee did additional NDE on three nozzles. Liquid dye-penetrant testing was performed on the welds of two of the nozzles, which included the J-groove weld area and extended 90 to 180 degrees around the circumference on the low end of the CEDM nozzle. No surface indications were found on these two nozzles. Regarding the third nozzle, EC (hand-held) examination was performed on the nozzle indication and no surface indications were found. Therefore, the licensee concluded that all 90 head penetrations have pressure boundary integrity with no indications of primary water stress corrosion cracking and no through-wall leaks that could cause head wastage. In addition, no signs of leakage were detected above the head on the insulation. Only very minor occasional boric acid staining was observed (likely from historical venting).

The licensee also verbally responded to five NRC staff questions that had previously been provided to them, as follows:

- Q1. It was indicated that one nozzle at ANO-1 has been repaired due to leakage. Please discuss whether there were opportunities to discover a cavity outside the nozzle during the repair process (through pre- or post-repair inspections, through preparation of the area for repair, etc.).
- A1. The licensee performed a visual exam on nozzle #56 with a remote crawler and found a small amount of boron which they characterized as a "trail." The licensee ground the J-groove weld and performed a repair. In addition, the licensee stated that there was no evidence of wastage and the amount of boron was very small.
- Q2. Has the boric acid on the insulation at ANO-2 been cleaned? If not, are there any plans to clean it?
- A2. The licensee has seen a slight powder which resulted from venting of the CEDMs in previous outages. Video from the most recent inspection shows no boron with the exception of the slight staining, therefore, the licensee concluded that there was no need to clean the insulation.

- Q3. Are any actions taken to prevent/minimize the amount of boric acid that is sprayed onto the head during the venting operation? Please describe these actions.
- A3. The vent line is now piped off to prevent boric acid from being sprayed onto the head during venting operations.
- Q4. With regard to future inspection plans, please define the type of evaluation that is stated in the following response to question 1.D for both ANO units: "If throughwall or throughweld cracks are found and a concentration of boron is found protruding through the annulus region of the penetration, an evaluation will be performed to determine if there is potential for wastage of the adjacent vessel material."
- A4. The licensee stated that NDE technology is evolving, but UT examination is the primary method that they plan to use for their examinations. The licensee also mentioned a new EC examination process that will look for loss of contact between the CEDM nozzle and the reactor vessel head. The licensee will further discuss their proposed evaluations in their 30-day response to the Bulletin.
- Q5. Since the insulation on ANO-2 cannot be easily removed, please address whether or not UT examination of the nozzles in ANO-2 alone (i.e., EC examination on only some of the nozzles) will identify reactor pressure vessel head wastage.
- A5. The licensee indicated that the UT examination technique alone is sufficient to identify whether or not a leakage path is present. The licensee stated that the UT examination technique can look through the nozzle, and a minimum of 0.050" into the weld. The UT examination will be further discussed in the licensee's demonstration report, which they committed to provide to the NRC staff.

NRC Staff Feedback

At the conclusion of the April 25, 2002 conference call, the staff thanked the licensee for its participation in the discussions on their reactor pressure vessel head inspection plans and results. Based on the inspections performed and the results obtained, the staff did not identify any issues that needed follow-up prior to ANO-2 restart.

Docket No. 50-368

Attachment: As stated

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