

December 9, 2003

Mr. Robert L. Clark
Office of Nuclear Regulatory Regulation
U.S. Nuclear Regulatory Commission
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Subject: 60 Day Post Inspection Response to Bulletin 2003-02, *Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity*
R. E. Ginna Nuclear Power Plant
Docket No.

Reference: (1) Letter from J.A. Widay, RG&E, to R.L. Clark, NRC, Subject: *60 Day Response to Bulletin 2003-02*, dated September 19, 2003.

Dear Mr. Clark:

Bulletin 2003-02 was issued on August 21, 2003 to all holders of operating licenses for active pressurized water reactors (PWRs). The subject bulletin required, and Rochester Gas and Electric (RG&E) committed to in Reference (1), that the PWR addressees submit to the NRC within 60 days of plant restart a summary of the inspections performed of the reactor pressure vessel (RPV) lower head. The required summary is enclosed with this letter. There are no licensee commitments contained within this letter.

I declare under penalty of perjury under the laws of the United States of America that I am authorized by RG&E to make this submittal and that the foregoing is true and correct.

Any questions concerning this submittal should be directed to Mr. Brian Flynn, Manager, Primary/Reactor Systems at (585) 771-3734.

Very truly yours,

Executed on December 9, 2003


Robert C. Mecredy

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Enclosure

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Bulletin 2003-02 requires the following information be provided. The remaining information requested in the bulletin was provided in RG&E letter dated September 19, 2003 (Reference 1).

- (2) **Within 60 days of plant restart following the next inspection of the RPV lower head penetrations, the subject PWR addresses should submit to the NRC a summary of the inspections performed, the extent of the inspections, the methods used, a description of the as-found condition of the lower head, any findings of relevant indications of through-wall leakage, and a summary of the disposition of any findings of boric acid deposits and any corrective actions taken as a result of indications found.**

RESPONSE:

The reactor pressure vessel (RPV) lower head was inspected during the Ginna Station 2003 refueling outage. Starting on September 18, 2003, the RPV lower head insulation was disassembled and lowered prior to refueling activities to allow for a bare metal visual examination. The insulation was lowered as a single piece using a temporary support assembly and winch system. This technique allowed the insulation to be reinstalled onto the lower head following completion of the inspection.

The visual examination was accomplished utilizing a Micro Video MVC2120 waterproof tube color camera attached to an adjustable inspection pole with an articulating joint for improved scanning capabilities. The camera has an auto iris with a manual focus. The camera focus was calibrated off an ASME Section XI VT-1 character card with 0.044" high characters which provided an examination range of 3" to 6" while still maintaining VT-1 character resolution consistent with ASME Section XI code IWA-2210. The camera has 6 white LED lights surrounding the camera lense housed within the camera enclosure for illumination. Tube lights were also placed on the inside of the lowered insulation for auxiliary lighting.

The bottom mounted instrumentation (BMI) nozzles have an Inconel weld pad around them on the vessel exterior which was ground flush and examined with penetrant testing and ultrasonic testing during manufacturing. The reactor vessel bottom head is coated with grey carbolene paint which was also applied during manufacture. The grey background provided an effective contrast for boric acid leakage deposition.

All 36 of the BMI nozzles were examined at VT-1 quality resolution 360° around their circumference for a minimum area of 1" radius around the tube to shell interface. Most nozzles were inspected a minimum of 3" radius around each nozzle interface. A general VT-2 quality inspection was also performed on the painted base material between the penetrations.

The BMI nozzles have unique identifications vibra etched just above the thimble tube socket weld which were marked during manufacture. All tubes were identified by marking the unique identifier and temporarily attaching it to the nozzle. These were video taped as part of the examination. All tubes were confirmed off of manufacturing drawing locations and verified from known marked BMI nozzles to assure 100% of nozzles were examined.

The RPV lower head examination was recorded on digital tape for archival purposes and for comparison to future examinations. RG&E ASME Section XI visually certified Level II and Level III nondestructive examiners, as well as engineering personnel, reviewed all examination data and documented results. The exams were also consistent with applicable information contained in the March 2002 EPRI report (Reference 2). NRC representatives reviewed all recorded data in addition to a first hand look of the general lower vessel head condition.

The results of the video examination revealed a painted lower head surface that was in good condition. Evidence of cavity seal leakage in the form of broad diffused boric acid residue in several areas around the bottom head was present. The residue was an opaque film on top of the painted surface and the source of leakage from the flow patterns for each area were traced and confirmed in all cases to be coming from the upper vessel area. These results are consistent with the type of boric acid residue that occur from cavity seal leakage during refueling activities. From the visual inspection evidence it was concluded that there was no active leakage and that the refueling activities from the 2003 outage did not contribute to the boric acid residue. Since the RPV head coating was in good condition the minor boric acid residue was determined as not being detrimental to the vessel integrity. The boric acid residue was diffused with no buildup or thickness. To further validate that no active boric acid leak was present, residue from areas around three nozzles and two areas of base material were sampled by wet smears and scrapings and examined with gamma spectroscopy. No sample had sufficient mass to perform wet chemistry analysis. The isotopic analysis concluded the absence of any short lived radionuclides and equated to an average age of ≥ 4 years. Based on this, no corrective actions were required.

Following the as-found examination described above, the insulation was left lowered during refueling activities and an assessment of the 2003 refueling cavity leakage was performed. After refueling activities, approximately 3" around each nozzle was steam cleaned with de-ionized water and stainless steel wire brushes to provide an improved inspection area going forward. The nozzles were then re-baselined to document the as-left condition and the RPV bottom head insulation was reinstalled. Future inspection activities related to the RPV bottom head are documented in Reference 1.

References:

1. Letter from J.A. Widay, RG&E, to R.L. Clark, NRC, Subject: *60 Day Response to Bulletin 2003-02*, dated September 19, 2003.
2. TR-1006899, "Visual Examination for Leakage of PWR Reactor Head Penetrations on Top of RPV Head: Revision 1 of 1006296, Includes Fall 2001 Results," EPRI, Palo Alto, CA, March 2002.