

June 28, 2002

LICENSEE: FirstEnergy Nuclear Operating Company

FACILITY: Davis-Besse Nuclear Power Station, Unit 1

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION, UNIT 1 - MEETING SUMMARY  
OF MAY 7, 2002, TO DISCUSS THE ROOT CAUSE ANALYSIS OF THE  
DEGRADATION OF THE REACTOR PRESSURE VESSEL HEAD

On May 7, 2002, Nuclear Regulatory Commission management and staff conducted a public meeting in Rockville, Maryland, with representatives of FirstEnergy Nuclear Operating Company. The purpose was to discuss the root cause analysis of the degradation of the reactor pressure vessel (RPV) head at the Davis-Besse Nuclear Power Station with interested members of the public. A public notice that the meeting was to be held was issued on April 25, 2002. A telephone conference bridge was established for members of the public who were unable to attend. The meeting's participants are included as Enclosure 1 and the licensee's handouts are included as Enclosure 2.

By letter dated April 18, 2002, the licensee provided their Root Cause Analysis. In summarizing their report, the licensee stated that inadequate inspection of the RPV closure head prevented early detection of nozzle leakage resulting in prolonged boric acid corrosion and significant degradation. When describing the ultra-sonic test results on page 10 of the licensee's handouts, the licensee acknowledged that a new through-wall crack had been identified in the Nozzle 2 test results earlier that day.

The licensee described the makeup and the work of the Root Cause Investigation Team and concluded that (1) the degradation to the RPV closure head was caused by primary water stress corrosion cracking of the control rod drive (CRD) nozzle which led to leaks that were undetected allowing corrosion to occur, and (2) the existing guidance/knowledge is adequate for understanding how to prevent RPV closure head degradation from any CRD nozzle leaks.

Page 23 of the licensee's handouts provided a time-line of key events through the last three refueling outages dating back to 1995. The licensee estimated that the longest through-wall cracks were initiated around 1990 ( $\pm 3$  years) and took approximately 4-6 years to propagate through the CRD nozzle wall. A significant increase in unidentified reactor coolant system leakage occurred during the 1998-1999 period. During this time period, the licensee observed that the white boron deposits initially limited to the RPV head began to change to become a significant flow of red colored boric acid emanating from the "mouse-holes" surrounding the service structure. At this same time, the licensee increased the frequency of changing the containment radiation monitor filters and the frequency of cleaning the containment air coolers.

The licensee described four stages of degradation of CRD nozzles. These include:

- Stage 1 - Crack Initiation Progression
- Stage 2 - Minor Weepage/Latency Period
- Stage 3 - Deep Annulus Corrosive Attack
- Stage 4 - General Boric Acid Corrosion

The licensee concluded that the Davis-Besse facility experienced four years of Stage 4 corrosion. This resulted in a maximum radial progression of approximately 7 inches at an average rate of 2 inches per year. The corrosion experienced was determined to be consistent with the Electric Power Research Institute Boric Acid Corrosion Guidebook.

The staff described the licensee's root cause analysis efforts as credible but also noted that uncertainties continue to exist.

Upon completion of the technical meeting with the licensee, questions were taken from members of the public who were present at the meeting followed by questions from the public on the telephone link-up. Questions focused on the licensee's proposed repair plan and the possibility of the licensee obtaining the RPV closure head from the abandoned Midland, Unit 2 facility. While the staff made clear that this decision was to be made by the licensee, the staff stated that a replacement head would represent a clearer success path.

/RA/

Douglas V. Pickett, Senior Project Manager, Section 2  
Project Directorate III  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosures: 1. Participants  
2. Meeting Slides

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Accession Numbers: Meeting Notice: ML021150460  
Meeting Summary: ML021680521  
Enclosure 2: ML021290524  
Package: ML021700632

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|--------|------------|------------|------------|
| OFFICE | PM:PDIII-2 | LA:PDIII-2 | SC:PDIII-2 |
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\*See previous concurrence

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NUCLEAR OPERATING COMPANY

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LIST OF MEETING PARTICIPANTS

MAY 7, 2002

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Jim Davis  
Ed Hackett  
John Jacobson  
Bill Cullen  
Stephen Sands  
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