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Commission Technical Assistant Briefing
October 11, 2001

Introduction:

On October 11, 2001, members of the FirstEnergy Nuclear Operating Company (FENOC) management team provided a briefing to the Commission Technical Assistants regarding the Davis-Besse position related to NRC Bulletin 2001-01, "Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles." The attendees are listed in the Attachment. FENOC'S stated meeting objective was to provide a reasonable basis for assurance that Davis-Besse is safe to operate until the next scheduled refueling outage in March 2002 and that the plant should continue on 24 month operating cycles.

Plant-Specific Positions:

FENOC provided the following positions identified during their review of the bulletin:

- All CRDM penetrations were verified to be free from the characteristic boron deposits using video recordings from the previous 2 refueling outages. These videos were made before and after cleaning the head.
- Plant specific finite element analysis shows that 65 out of 69 penetrations will open up sufficiently to provide visual indication.
- The remaining four CRDM penetrations are located in the lowest stress area. No circumferential cracks have been identified at other plants in this region (Top of the head).
- The Davis-Besse critical crack size is 273 degrees. That includes a safety factor of three in accordance with the ASME code.
- Davis-Besse has a better as-built record of their head and the interference fits than other plants. As such, Davis-Besse has done more and better quality inspections than other plants.

Analytical Assumptions:

Given these positions, the licensee analyzed potential cracking. They determined that, by conservative analysis, a potential crack would not grow to critical crack size before their next refueling outage. The following assumptions were utilized:

- An initial crack size of 180 degrees at the beginning of Cycle 12 (1998). This crack was not identified in either of the next 2 visual inspections;
- The crack propagates in two directions;
- Industry accepted crack growth rates for Alloy 600 are applicable; and
- No credit was given for decreasing stresses as the crack grows.

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The licensee also presented their vendor-specific risk assessment that provided an estimated core damage frequency of 3.4 E -7.

Differences with Staff:

FENOC representatives stated that their analytical results differed with the staff's on the following points (Note that the "staff positions" stated below are as provided by FENOC):

1. The staff does not believe that Davis-Besse has a qualified method for visual inspection of the penetration welds.

   FENOC stated that while the inspections performed during the past 2 outages were not conducted with these specific failures in mind, they were video taped. These video tapes were of sufficient quality that permitted reinspection of the head looking for the characteristic boron deposits. FENOC stated that they are completing the process to qualify this visual inspection technique for 65 of the 69 penetrations.

2. The staff stated that a given crack could grow to critical size within 18 months.

   As discussed above, FENOC's analysis indicates that it would take more than 4 years for that amount of growth to occur.

Request for Additional Dialog:

FENOC management requested that additional dialog take place prior to the NRC taking action in this area. They stated that Davis-Besse has been placed in a high-risk group based on their vendor type, past inspections, and their effective full-power years. However, FENOC stated that due process requires that the plant-specific nature of this phenomena be evaluated. The management stated their intent to take whatever action is necessary. Therefore, they considered it imperative that NRC provide the basis for their conclusions. The following specific concerns were raised:

1. FENOC managers stated that, during an October 3, 2001 teleconference, they requested that NRR provide the specifics of the analysis and the models used that indicates appreciably faster growth rate than that determined by FENOC. The staff has not provided documentation of this analysis.

2. FENOC stated that they also requested the specific NRC risk analysis that resulted in a core damage frequency of 2E-2 to 1.4E-3, as this differed from their vendor specific analysis of 3.4 E-7, noting that their number was categorized as a very small increase in risk in accordance with Regulatory Guide 1.174. The staff has not provided documentation of this analysis.

3. FENOC stated that, during the October 3 call, they informed the staff that they had video tapes of the head, a finite element analysis, and a crack growth rate model that differed from the NRC's. FENOC also informed the staff that they would submit all data for staff review. The staff has not requested to review this data.

Summary:

FENOC closed their presentation by indicating that their plant-specific deterministic and probabilistic assessments of the CRDM cracking issue provided a reasonable basis for assurance that Davis-Besse is safe to operate until March 2002. They stated that, as such, FENOC does not have indication of a need for early shutdown of Davis-Besse. They stated that the primary need at the present time is for the staff for review Davis-Besse's analysis and provide FENOC with specific information related to the NRC's analysis.

Staff Meeting:

Immediately following the briefing, FENOC officials met briefly with the staff. The following was decided:

- The NRC staff would continue to take action as was deemed necessary throughout the review of new FENOC information.
- The ongoing staff review and analysis is in preparation and predecisional, and as such, can not be provided to FENOC at this time.
- FENOC would provide, on October 12, 2001, a schedule for submission of their data over the next few business days, while ensuring the quality of the submittals.
- NRR staff would review the documentation provided in preparation for a staff-level meeting with FENOC.
- A meeting would be held, presumably during the week ending October 20, 2001, to discuss the FENOC analysis, provided that the information submitted represented a new position to the staff.
- Both sides agreed to attempt a rapid resolution of this issue.

Attachment

Technical Assistant Briefing Attendees

Presenters:

- Guy G. Campbell, Vice President - FENOC
- Steven P. Moffitt, Director, Technical Services
- David C. Geisen, Manager, Design Basis Engineering
- David H. Lockwood, Manager, Regulatory Affairs
- Steve Fyfitch, Framatome Engineering

FENOC Attendees:

- Roy Lessy, Attorney, Akin, Gump, et. al,
- Mike Doweling
- Gerald Wolf

Technical Assistants

- Darrell Roberts, OCM/Merserve
- Rich Croteau, OCM/Diaz
- Sunil Weerakkody, OCM/Dicus
- Tom Hiltz, OCM/Dicus
- Jim Beall, OCM/McGaffigan

Other NRC Attendees:

- David Loveless, OEDO
- Stacey Rosenberg, OEDO
- Bill Bateman, NRR
- Allen Hiser, NRR