Issues for Stipulation

On August 3, 2001, the NRC issued "NRC Bulletin 2001-01: (Reactor Pressure Vessel Head Penetration Nozzles" requesti for pressurized water nuclear power reactors to provide inform integrity of reactor pressure vessel head penetration (RPV) nozzles, including the extent of VHP nozzle leakage and cracking, the inspections and repairs that have been undertaken to satisfy NRC regulatory requirements and the basis for concluding that plans for future inspections will ensure compliance with those requirements.

The Bulletin explained that cracked and leaking VHP nozzles had been discovered at reactors where the only indications of leakage were small boric acid deposits at the nozzle penetrations. Specifically, at the Oconee Nuclear Station Unit 3 (ONS3), reactor leakage from a cracked nozzle had resulted in a boric acid deposit of less than 1 cubic inch where the CRDM nozzle exited the RPV head. These findings raised a staff concern that visual head examinations at reactors may not find such small indications of nozzle leakage which could be indicative of circumferential cracking of the nozzles. Specifically Bulletin stated:

> . . .the presence of circumferential cracking at ONS3 where only a small amount of boric acid residue indicated a problem, calls into question the adequacy of current visual examinations for detecting either axial or circumferential cracking in VHP nozzles. This is especially significant if prior existing boric acid deposits on the RPV head mask the identification of new deposits. Also, the presence of insulation on the RPV head or other impediments may restrict an effective visual examination. As a remedial measure the RPV head may have to be cleaned at a prior outage for effective identification of new deposits from VHP nozzle cracking if new deposits cannot be discriminated from existing deposits from other sources. However, the NRC staff believes that boric acid deposits that cannot be dispositioned as coming from another source should be considered, as a conservative assumption, to be from VHP nozzles, and appropriate corrective actions may be necessary. In addition, the use of special tooling or procedures may be required to provide assurance that the visual examinations will be effective in detecting the relevant conditions.

The Bulletin further stated:

> The cracking identified at ONS2 and ONS3 reinforces the importance of conducting effective examinations of the RPV upper head area (e.g., visual under-the-insulation examinations of the penetrations for evidence of borated water leakage, or volumetric examinations of the CRDM nozzles), and using appropriate NDE methods (such as PT, UT, and eddy-current testing) to adequately characterize cracks. Because of plant-specific design characteristics, there is no uniform way to perform effective visual examinations of the RPV head at PWR facilities. Some plants have the head insulation sufficiently offset from the RPV head to permit an effective visual examination. Other plants have the insulation offset from the head but in a contour matching that of the head, requiring special tooling and procedures to perform an effective visual examination. Still other plants have insulation directly adjacent to or attached to the RPV head, potentially requiring the removal of the insulation to permit an effective visual examination. Several licensees have recently performed expanded VT-2 examinations using remote devices to inspect between the RPV head and insulation. One aspect of

conducting effective visual examinations that is common to all PWR plants is the need to successfully distinguish boric acid deposits originating with BHP nozzle cracking from deposits that are attributable to other sources.

The Bulletin categorized plants according to their susceptibility to pressure water stress corrosion cracking (PWSCC): Low, moderate or high. Davis Besse was in the high susceptibility category.

Materiality

The NRC issued NRC Bulletin 2001-01 because of new information that raised staff concern that visual inspections would not detect evidence of circumferential cracking of RPV nozzles. The new information, indicating that visual evidence of cracking may be limited to a small amount of boric acid residue, raised the concerns that such small indications could be (1) masked by other boric acid deposits, or (2) missed in the event that insulation or other impediments restricted the visual examination of the head.

FENOC responded to the bulletin for the Davis-Besse Nuclear Power Station (DBNPS) in written submittals identified as Serial Letters 2731, 2735 and 2744, described below. Managers of DBNPS provided additional information responsive to the bulletin in a teleconference with the staff on October 3, 2001, in a briefing before the Commissioners' technical assistants on October 11, 2001, and during a meeting of the Advisory Committee on Reactor Safeguards (ACRS) meeting on November 9, 2001. The staff considered all of that information in order to determine whether regulatory action was necessary to address circumferential cracking of nozzles at the DBNPS.

Serial Letter 2731

FirstEnergy Corporation (FENOC) responded to the NRC Bulletin for the DBNPS in a submittal identified as Serial Letter 2731 on September 4, 2001. In part, Serial Letter 2731 responded to Item 1.d of the NRC Bulletin which requested:

> [A] description of the VHP nozzle and RPV head inspections (type, scope, qualification requirements, and acceptance criteria) that have been performed at your plant(s) in the past 4 years, and the findings. Include a description of any limitations (insulation or other impediments) to accessibility of the bare metal of the RPV head for visual examinations.

FENOC's response included the following statements:

> The DBNPS has performed two inspections within the past four years, during the 11th Refueling Outage (RFO) in April 1998 and during the 12th RFO in April 2000. The scope of the visual inspection was to inspect the bare metal RPV head that was accessible through the weep holes to identify any boric acid leaks/deposits. The DBNPS also inspected 100% of Control Rod Drive Mechanism (CRDM) flanges for leaks in response to Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants." The results of these two recent inspections are described below.

Inspections of the RPV head area performed with the RPV head insulation installed in accordance with DBNPS procedure NG-EN-00324, "Boric Acid Corrosion Control Program," which was developed in response to Generic Letter 88-05. As stated previously, a gap exists between the RPV head and the insulation, the minimum gap being at the dome center of the RPV head where it is approximately 2 inches, and does not impede visual inspection. The service structure envelopes the DBNPS RPV head and has 18 openings (weep holes) at the bottom through which inspections are performed. There are 69 CRDM nozzles that penetrate the RPV head. The metal reflective insulation is located above the head and does not interfere with the visual inspection. The visual inspection is performed by the use of a small camera. This camera is inserted through the weep holes.

. . . .

April 2000 Inspection Results (12 RFO)
In April 2000, Framatome Nuclear Power Services performed a 100% video inspection of CRDM flanges above the RPV insulation. Five leaking CRDM flanges were identified at locations F10, D10, C11, F8 and G9. The main source of leakage was associated with the D10 CRDM flange. Positive evidence (boron deposits on the vertical faces of the CRDM flanges and nozzle) existed that drives F8, F10 and C11 had limited gasket leakage. CRDM G9 had boron deposits under the CRDM flange between the flange and insulation, providing confidence that this leakage was associated with flange leakage. All five CRDM gaskets were replaced and the D10 CRDM flange was machined. Visual inspection of the flanges was performed. Some boric acid crystals had accumulated on the RPV head insulation beneath the leaking flanges. These deposits were cleaned (vacuumed). After cleaning the area above the insulation was videotaped for future reference.

Inspection of the RPV head/nozzles area indicated some accumulation of boric acid deposits. The boric acid deposits were located beneath the leaking flanges with clear evidence of downward flow. No visible evidence of nozzle leakage was detected. The RPV head area was cleaned with demineralized water to the greatest extent possible while maintaining the principles of As-Low-As-Reasonably-Achievable (ALARA) regarding the dose. Subsequent video inspection of the cleaned RPV head areas and nozzles was performed for future reference.

Subsequent Review of the 1998 and 2000 Inspection Videotapes Results
Since May 2001, a review of the 1998 and 2000 inspection videotapes of the RPV head has been performed. This review was conducted to re-confirm the indications of boron leakage experienced at the DBNPS were not similar to the indications seen at ONS and ANO-1; i.e., was not indicative of RPV nozzle leakage. This review determined that indications such as those that would result from RPV head penetration leakage were not evident.

Serial Letter 2731 was incomplete or inaccurate:

Serial Letter 2731's description of the amount of boric acid deposits found on the RPV head during the 12th refueling outage (12RFO) inspection conducted in 2000 was not complete and accurate. The Serial Letter's statement that the inspection revealed indications of "some" boric acid accumulations did not accurately describe the extent of the accumulations viewed during the inspection. In fact, the 12RFO inspection revealed large accumulations of boric acid on the RPV head which precluded access to substantial portions of the RPV head, completely engulfed many nozzle penetrations and leaked out of weep holes at the bottom of the head.

Serial Letter 2731 was incomplete because it did not state that boric acid deposits impeded access to the RPV head during the 11RFO and 12RFO inspections. Boric acid deposits filled weepholes through which the inspection camera was inserted, making it impossible to view the head through those access points. Boric acid deposits also prevented access to portions of the head where it extended from the RPV head to the insulation above the head.

Serial Letter 2731 was incomplete because it failed to disclose that boric acid deposits on the RPV head made it impossible to inspect a significant number of RPV head nozzle penetrations.

Serial Letter 2731 inaccurately stated that reviews of the 1998 and 2000 inspection videotapes confirmed that there were no indications of boron leakage on the Davis Besse RPV head similar to those observed at ONS3 and ANO-1. The boron deposits observed at ONS3 and ANO-1 were small, measuring less than 1 cubic inch. At Davis Besse, the 1998 and 2000 inspection videotapes showed large accumulations of boric acid deposits which precluded access to substantial portions of the head and obscured a substantial number of the nozzle penetrations. The large accumulations of boric acid deposits would have obscured any indications of nozzle leakage such as those seen at ONS and ANO-1.

October 3, 2001, Teleconference

On October 3, 2001, representatives of FENOC (including Mr. Geisen) held a telephone conference with representatives of the NRC. The telephone conference was a follow-up to FENOC's September 4, 2001 response (Serial Letter 2731) to NRC Bulletin 2001-01. The participants discussed the condition of the RPV head during video inspections performed during 10RFO, 11RFO and 12RFO. Mr. Geisen stated that videotapes of the 10RFO, 11RFO, and 12RFO reactor pressure vessel head inspections had been reviewed. For the 12RFO, he stated that 100% of the reactor pressure vessel head had been inspected except for 5-6 nozzles on top of the RPV head where inspection was precluded because of flange leakage.

Mr. Geisen's statement that 100% of the RPV head had been inspected but for 5-6 nozzles at the top of the RPV head was inaccurate because large accumulations of boric acid deposits impeded access to large portions of the RPV head, extending well beyond the top nozzles. In fact, the boric acid deposits prevented inspection of at least 24 nozzle penetrations.

October 11, 2001, Commission Technical Assistant Briefing

On October 11, 2001, Mr. Geisen and other FENOC managers met with the NRC Commissioners' Technical Assistants (TAs) to present a safety basis to allow operation until the refueling outage scheduled for March 2002 (13RFO). During the meeting, Mr. Geisen presented slides 6 and 7, both of which described the results of inspections of the RPV head. Slide 6 stated "[c]onducted and recorded video inspection of head during 11RFO (April 1998) and 12 RFO (April 2000) . . . No head penetration leakage was identified." Slide 7 stated "[a]ll CRDM [control rod drive mechanism] penetrations were verified to be free from "popcorn" type boron deposits using video recordings from 11RFO or 12RFO." Slide 7 also stated "[p]opcorn" type boron deposits were found to be evidence of a circumferential nozzle crack on the RPV head at the Oconee Nuclear Power Plant.

Mr. Geisen inaccurately represented that all CRDM penetrations were verified to be free from "popcorn" type deposits using video recordings from 11RFO or 12RFO. The inspection videos actually showed that boric acid deposits masked a substantial number of the CRDM penetrations, making it impossible to verify that "popcorn" type deposits were not present on those penetrations. Absent such verification, it was impossible to determine whether evidence of head penetration leakage was present.

Serial Letter 2735

FENOC provided a supplemental response to the NRC Bulletin for DBNPS in a submittal identified as Serial Letter 2735 on October 17, 2001. Serial Letter 2735 provided supplemental information regarding the results of the head inspections conducted in 1998 and 2000. In addition, the Serial Letter included information concerning the head inspection conducted in 1996 during the 10RFO to support FENOC's claim that, notwithstanding the existence of boric acid deposits on the RPV head, there would be minimal public risk if DBNPS were allowed to operate until the next refueling outage, scheduled for March 2002, when a qualified visual inspection of the RPV head would be performed. This claim was supported by a safety assessment which assumed that routine inspections would detect minor leaks well before any catastrophic failure could occur. The safety assessment concluded that these visual inspections would minimize public risk because it was highly likely that signs of CRDM nozzle or penetration weld leakage would be observed before the leakage caused CRDM nozzle structural failure or detachment.

The safety assessment, which was prepared by a contractor to FENOC, noted:

> . . . boric acid crystal buildup from flange leaks may have masked indications of CRDM nozzle leakage in the past, and may have contributed to the exterior circumferential OD cracks at the ONS not being detected by an inspection sooner.
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> . . . .
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> Over the last five to seven years, the RV head inspections have become increasingly more meaningful because of utility efforts to clean the head of boron deposits resulting from past CRDM nozzle flange leakage and other sources. A clean RV head will make new boron crystals at the nozzle penetrations more evident, and reduce the likelihood that the leakage will be missed or masked by other sources of boron on the RV head.

The Serial Letter included the following summary information regarding the inspections of the RPV head:

> In May 1996, during a refueling outage, the RPV head was inspected. No leakage was identified, and these results have been recently verified by a re-review of the video tapes obtained from that inspection. The RPV head was mechanically cleaned at the end of the outage. Subsequent inspections of the RPV head in the next two refueling outages

(1998 and 2000), also did not identify any leakage in the CRDM nozzle-to-head areas that could be inspected. Video tapes taken during these inspections have also been re-reviewed.

Accordingly, using the end of outage in 1996 as the postulated worst-case time for an axial crack to reach a through-wall condition, the projected time for the crack to reach its critical through-wall circumferential size was determined based on the results from an Framatome ANP assessment. This RV Head Nozzle and Weld Safety Assessment demonstrates the postulated crack will take approximately 7.5 years to manifest into an ASME Code allowable crack size. Applying this 7.5 years to the May 1996 inspection projects the worst-case allowable crack size being reached in November 2003. It is important to note the allowable crack size will still maintain an ASME Code safety factor of three.

. . . .

Based on the previous inspections conducted, re-reviewed inspection videos, analyses that have been performed concerning crack growth rates, the ability to identify cracking, and industry evaluations and findings, it is concluded there is reasonable assurance that the DBNPS will continue to operate safely to the next refueling outage scheduled for March 2002.

The Serial Letter included the following supplemental information regarding the inspections of the RPV head:

The inspections performed during the 10th, 11th, and 12 Refueling Outage (10 RFO, conducted April 8 to June 2, 1996; 11RFO, conducted April 10, to the May 23, 1998; and, 12RFO, conducted April 1 to May 18, 2000) consisted of a whole head visual inspection of the RPV head in accordance with the DBNPS Boric Acid control Program pursuant to Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants." The visual inspections were conducted by remote camera and included below insulation inspections of the RPV bare head such that the Control rod Drive Mechanism (CRDM) nozzle penetrations were viewed. During 10RFO, 65 of 69 nozzles were viewed, during 11RFO, 50 of 69 nozzles were viewed, and during 12RFO, 45 of 69 nozzles were viewed. It should be noted that 19 of the obscured nozzles in 12 RFO were also those obscured in 11RFO. Following 11RFO, the RPV head was mechanically cleaned in localized areas as limited by the service structure design. Following 12RFO, the RPV head was cleaned with demineralized water to the extent possible to provide a clean head for evaluating future inspection results.

The affected areas of accumulated boric acid crystal deposits were video taped, and have subsequently been reviewed with specific focus on boric acid crystal deposits with reference to the CRDM nozzle penetration leakage as previously observed at the Oconee Nuclear Station, Unit 3 (ONS-3) and at Arkansas Nuclear One, Unit 1 (ANO-1). During the 12RFO inspection, 24 of the 69 nozzles were obscured by boric acid crystal deposits that were clearly attributable to leaking motor tube flanges from the center CRDMs. A further subsequent review of the video tapes has been conducted and corroborates the previous statements and conclusions stated in letter Serial Number 2731 that the results of this review did not identify any boric acid crystal deposits that would have been attributed to leakage from the CRDM nozzle penetrations, but were indicative of CRDM flange leakage. Included as Attachments 2 and 3 are the inspection results for 10RFO, 11RFO and 12RFO, and a figure representing these nozzle locations, respectively.

A table attached to Serial Letter 2735 depicted the inspection findings from 1996, 1998 and 2000. The findings were identified as (1) flange leak evident, (2) no leak observed, meaning the visual inspection was satisfactory and no video record was required, or (3) no leak recorded, meaning that nozzle inspection was recorded on videotape. For the 1996 inspection, no findings were reported on the table. A footnote to the table stated the following:

> In 1996 during 10RFO, the entire RPV head was inspected. Since the video was void of head orientation narration, each specific nozzle view could not be correlated.

Also attached to Serial Letter 2735 were head maps on which the 11 and 12RFO inspection findings were depicted. The head maps identified the following information for each nozzle for the 11RFO inspection, the 12 RFO inspection, and the 11RFO & 12RFO inspections combined:

(1) No leakage identified
(2) Evaluated not to have sufficient gap to exhibit leakage
(3) Insufficient gap with leaking flange
(4) Nozzle obscured by boron
(5) Nozzle obscured by boron with leaking flange
(6) Newly affected, since 11RFO, by leaking flange(s)

The head map for 11RFO labeled 50 of the 69 nozzles "no leakage identified." The remaining 19 nozzles - labeled (2) through (5) - were clustered in the southeastern portion of the head. The head map for 12RFO labeled 45 of the 69 nozzles as "no leakage identified." The remaining 24 nozzles – labeled (2) through (5) - included the same nozzles with those labels for 11RFO and 5 additional nozzles located in the southeastern portion of the head.

The head maps for 11RFO and 12RFO labeled five nozzles on the southeastern portion of the head to be (3) or (6), "with leaking flange."

<u>Serial Letter 2735 was incomplete and inaccurate</u>:

Serial Letter 2735 inaccurately and/or incompletely reported the results of nozzle inspections during the 10, 11 and 12RFO inspections in the following respects:

- Serial Letter 2735 incorrectly reported that the 10RFO inspection showed no indications of nozzle leakage for 65 of 69 nozzles. However, significantly fewer nozzle penetrations were viewed during that inspection.
- Serial Letter 2735 incorrectly reported that the 11RFO inspection showed no indications of nozzle leakage for 50 of 69 nozzles. However, significantly fewer nozzle penetrations were viewed during that inspection.
- Serial Letter 2735 incorrectly reported that the 12RFO inspection showed no indications of nozzle leakage for 45 of 69 nozzles. However, significantly fewer nozzle penetrations were viewed during that inspection.

Serial Letter 2735 stated that a review of the video tapes from 11RFO and 12RFO inspections corroborated the conclusion in Serial Letter 2731 that no boric acid crystal deposits indicative of CRDM nozzle leakage were present. However, boric acid deposits precluded access to substantial portions of the head and obscured many of the nozzle penetrations, making it impossible to determine whether boric acid deposits indicative of nozzle leakage were present. These deposits would obscure any boric acid deposits characteristic of nozzle leakage, making it impossible to determine whether boric acid deposits indicative of nozzle leakage were present.

Serial Letter 2744

FENOC provided another supplemental response to the NRC Bulletin 2001-01 on October 30, 2001 (Serial Letter 2744). Serial Letter 2744 provided the following supplemental information regarding the inspections of the RPV head:

> The inspections performed during the 10th, 11th, and 12th Refueling Outage (10RFO, conducted April 8 to June 2, 1996; 11RFO, conducted April 10, to May 23, 1998; and, 12RFO, conducted April 1 to May 18, 2000) consisted of a whole head visual inspection of the RPV head in accordance with the DBNPS Boric Acid Corrosion Control Program pursuant to Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants." The visual inspections were conducted by remote camera and included below insulation inspections of the RPV bare head such that the Control Rod Drive Mechanism (CRDM) nozzle penetrations were viewed. During 10RFO, 65 of 69 nozzles were viewed, during 11RFO, 50 of 69 nozzles were viewed, and during 12RFO, 45 of 69 nozzles were viewed. It should be noted that 19 of the obscured nozzles in 12RFO were also those obscured in 11RFO. Following 11RFO, the RPV head was mechanically cleaned in localized areas as limited by the service structure design. Following 12RFO, the RPV head was cleaned with demineralized water to the extent possible to provide a clean head for evaluating future inspection results.
>
> The affected areas of accumulated boric acid crystal deposits were video taped, and have subsequently been reviewed with specific focus on boric acid crystal deposits with reference to the CRDM nozzle penetration leakage as previously observed at the Oconee Nuclear Station, Unit 3 (ONS-3) and at Arkansas Nuclear One, Unit 1 (ANO-1). During the 12RFO inspection, 24 of the 69 nozzles were obscured by boric acid crystal deposits that were clearly attributable to leaking motor tube flanges from the center CRDMs. A further subsequent review of the video tapes has been conducted and the results of this review did not identify any boric acid crystal deposits that would have been attributed to leakage from the CRDM nozzle penetrations, but were indicative of CRDM flange leakage.

Attached to Serial Letter 2744 was a copy of the nozzle table submitted as an attachment to Serial Letter 2735 on which footnote 1 had been revised. On the table submitted with Serial Letter 2744 the footnote read:

> In 1996 during 10 RFO, 100% of nozzles were inspected by visual examination. Since the video was void of head orientation narration, each specific nozzle view could not be

correlated by nozzle number. Nozzles 1, 2 3, and 4 which do not have sufficient interference gap were excluded. The remaining 65 nozzles did not show any evidence of leakage.

Also attached to Serial Letter 2744 were head maps depicting the results of the 11 and 12RFO inspections submitted with Serial Letter 2735. Also submitted with Serial Letter 2744, under attachments labeled "Spring 1996 Inspection," "Spring 1998 Inspection," and "Spring 2000 Inspection," were pictures of the RPV head obtained from the videotape inspections.
The Spring 1996 inspection attachment included:

- Photographs depicting boric acid deposits on the RPV head
- A caption that stated "Some boron piles were observed at the top of the head in the vicinity of previous leaking flanges. Because of its location on the head, it could not be removed by mechanical cleaning but was verified to not be active or wet and therefore did not pose a threat to the head from corrosion standpoint. Additionally, since these drives are not credited with leaking, that further ratifies that the boron is from previous flange leakage. The boron was heaviest beneath the mirror insulation seams.
- A caption that stated "[b]ecause of its location on the head, [a pile of boric acid] could not be removed by mechanical cleaning but was verified to not be active or wet and therefore did not pose a threat to the head from a corrosion standpoint."

The Spring 1998 inspection attachment included:

- Photographs depicting boric acid deposits on the RPV head.
- A caption stating "[a]lthough much more video can be viewed, these attached pictures are representative of the condition of the drives and the heads."

The Spring 2000 inspection attachment included:

- Photographs depicting boric acid deposits on the RPV head.
- A caption stating "[t]he photo for No. 19 depicts in the background the extent of boron buildup on the head and is the reason no credit is taken for being able to visually inspect the remainder of the drives."

<u>The information submitted in Serial Letter 2744 was inaccurate and incomplete</u>:

Serial Letter 2744 incorrectly reported that:

- 65 of 69 nozzles were viewed during 10 RFO. In fact, significantly fewer nozzles were viewed
- 50 of 69 nozzles were viewed during 11 RFO. In fact, significantly fewer nozzles were viewed
- 45 of 69 nozzles were viewed during 12 RFO. In fact, significantly fewer nozzles were viewed.

Serial Letter 2744 inaccurately stated that the video tapes from the 1998 and 2000 inspections did not show any boric acid crystal deposits from CRDM nozzle penetration leakage. The video tapes showed extensive boric acid deposits which obscured substantial portions of the RPV head and many of the nozzle penetrations. These deposits would obscure any boric acid deposits characteristic of nozzle leakage, making it impossible to determine whether boric acid deposits indicative of nozzle leakage were present.

Serial Letter 2744 inaccurately stated that (1) the photographs for the 1996 inspection (10RFO) were representative of the condition of the RPV head at the time and (2) "[t]he head was relatively clean and afforded a generally good inspection." In fact, the head was not relatively clean in 1996 and a good inspection was not completed. The photographs depicted only small boric acid deposits and failed to show the much larger boric acid deposits found during the inspection.

Serial Letter 2744 misrepresented the condition of the RPV head by including only photographs showing small amounts of boric acid deposits and omitting photographs showing larger boric acid deposits from the RPV inspection videotapes.

Serial Letter 2744 inaccurately stated that the photographs for the 1998 inspection (11RFO) were representative of the condition of the RPV head. In fact, the photographs depicted only small boric acid deposits and failed to show the much larger boric acid deposits found during the inspection.

Serial Letter 2744 stated that the photograph for nozzle 19 from the 2000 inspection (11RFO) showed the extent of boric buildup on the head. However, the inspection videotape showed that the boric acid buildup was much greater than that shown in photograph 19.

The table submitted with Serial Letter 2744 inaccurately stated that during 10RFO 100% of the nozzles were inspected by visual examination when extensive deposits of boric acid prevented inspection of nearly half of the nozzles during that outage.

The table submitted with Serial Letter 2744 inaccurately stated that the 1996 inspection video was void of head orientation making it impossible to determine nozzle numbers. In fact, the video recording contained head orientation narration which permitted nozzle identification.

The table submitted with Serial Letter 2744 inaccurately stated that 65 of the nozzles (excluding nozzles 1, 2, 3 and 4) did not show any evidence of leakage. In fact, extensive boron deposits on the RPV head obscured substantial portions of the head and many nozzle head penetrations, making it impossible to determine whether the small popcorn types of deposits associated with nozzle leakage were present on a substantial number of those 65 nozzles.

November 9, 2001 ACRS Meeting

On November 9, 2001, Mr. Geisen and other FENOC managers presented information on circumferential cracking of the Davis Besse RPV head nozzles at an Advisory Committee on Reactor Safeguards (ACRS) meeting. The presentation provided FENOC's justification for continued operation until the refueling outage scheduled for March 2002. In response to a question on the extent of the 1998 and 2000 inspections, Mr. Geisen stated:

> I'll talk to that. What we did is recognize - - this is Dave Geisen. With regard to these inspections, recognize that they were not done looking for this particular phenomenon. They were looking for other things. The two inspections done in 1998 and 2000 were really looking for the impact of boric acid leakage from leaky flanges that we had subsequently repaired and what was the impact to that. So the view we got from those was in many cases some of the drives you couldn't event get a good view of. There were many cases, the camera angle was looking upwards because it was looking at the structural material of the service structure on top of the head.

When we looked at a 1996 data, you got more of a downward look at these nozzles because we were specifically following around a vacuum and probe that was looking for head wastage as result of the boron being deposited on head. So what really comes down to it, the best video we have on this goes all the way back to 1996.