

**From:** Eric Duncan *R3*  
**To:** Bruce Burgess; Kenneth O'Brien  
**Date:** Wed, May 9, 2007 9:59 AM  
**Subject:** Fwd: Davis-Besse Serial 3334

FYI.

*F-221*

**From:** <rritzman@firstenergycorp.com>  
**To:** <erd@nrc.gov>  
**Date:** Thu, Apr 5, 2007 9:14 AM  
**Subject:** Davis-Besse Serial 3334

(See attached file: Serial 3334 - final.pdf)

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FirstEnergy Nuclear Operating Company

76 South Main Street  
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Danny L. Pace  
Senior Vice President, Engineering

330-384-3733  
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Docket Number 50-346

License Number NPF-3

Serial Number 3334

April 4, 2007

United States Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555-0001

Subject: Submittal of February 23, 2007 letter from Nuclear Electric Insurance Limited

Ladies and Gentlemen:

As discussed during a telephone conference on April 3, 2007, with members of the Nuclear Regulatory Commission staff, the FirstEnergy Nuclear Operating Company (FENOC) is enclosing a copy of the February 23, 2007, letter from Mr. David B. Ripsom, President and Chief Executive Officer of Nuclear Electric Insurance Limited (NEIL), to Mr. Gary R. Leidich, President and Chief Nuclear Officer of FENOC. This letter asserted a potential safety concern relating to a report prepared by the Exponent Failure Analysis Associates and Altran Solutions Corporation entitled "Review and Analysis of the Davis-Besse March 2002 Reactor Pressure Vessel Head Wastage Event" dated December 15, 2006 (Exponent Report). The Exponent Report and opinions were developed in support of a FENOC insurance claim. This report was transmitted to the Nuclear Regulatory Commission via FENOC letter Serial Number 3331 dated March 20, 2007.

Based on review of the potential safety concern, FENOC does not believe that the inspection requirements for the Davis-Besse Nuclear Power Station Reactor Pressure Vessel Head (RPVH) and the detection of cracks in the RPVH Control Rod Drive Nozzles were adversely affected by the crack growth rates utilized in the Exponent Report. These conclusions were documented in the FENOC Corrective Action Program. In addition, FENOC is performing a review of the original RPVH Root Cause Evaluations to ensure that the conclusions reflected in the Exponent Report are bounded by the Corrective Actions from these Root Cause Evaluations.

In order to facilitate the industry's analysis of this phenomenon, FENOC has submitted the Exponent Report to the Nuclear Energy Institute's (NEI's) Materials Executive Oversight Group for their assessment of ramifications on industry materials inspection guidance and generic safety implications. FENOC also provided the Exponent Report to the Institute of Nuclear Power Operations (INPO) for their information.

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If you have any questions or require further information, please contact Mr. James J. Powers,  
Director, Fleet Engineering, at (330) 384-4930.

Very truly yours,



Danny L. Pace  
Senior Vice President, Fleet Engineering

GMW/s

Attachment  
Enclosure

cc: Regional Administrator, NRC Region III  
Branch Chief, NRC Region III Reactor Projects Branch 6  
DB-1 NRC/NRR Project Manager  
DB-1 Senior NRC Resident Inspector  
Utility Radiological Safety Board

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Attachment 1  
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**COMMITMENT LIST**

The following list identifies those actions committed to by the Davis-Besse Nuclear Power Station in this document. Any other actions discussed in the submittal represent intended or planned actions by Davis-Besse. They are described only as information and are not regulatory commitments. Please notify the Manager, Regulatory Compliance (Acting), at (419) 321-7120 at Davis-Besse of any questions regarding this document or associated regulatory commitments.

**COMMITMENTS**

**DUE DATE**

None

N/A

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Serial Number 3334  
Enclosure 1

**February 23, 2007, letter from  
Mr. David B. Ripsom, President and Chief Executive Officer of  
Nuclear Electric Insurance Limited,  
to  
Mr. Gary R. Leidich, President and Chief Nuclear Officer of  
FirstEnergy Nuclear Operating Company**

(3 pages follow)



NEIL

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February 23, 2007

Via email and First Class Mail

Mr. Gary R. Leidich  
President and Chief Nuclear Officer  
FirstEnergy Nuclear Operating Company  
76 South Main Street  
Akron, Ohio 44308

Re: Potential Safety Concern Arising From Exponent Failure Analysis Associates and Altran Solutions Corporation, December 15, 2006 Report entitled "Review and Analysis of the Davis-Besse March 2002 Reactor Pressure Vessel Head Wastage Event"

Dear Gary:

I am writing as a follow up to our telephone conversation earlier today. Under ordinary circumstances, I would not be contacting you regarding matters associated with a pending claim. However, we identified a potential safety concern that has arisen out of the filings made by FirstEnergy Nuclear Operating Company ("FENOC") in the arbitration with NEIL on the Davis-Besse claim. The matter has been discussed with NEIL Board members (two with nuclear operating experience) and with former senior NRC officials. Because the concern has potential impact on Members other than FENOC, and because NEIL, as a mutual company, must take into consideration the concerns of all its Members (not to mention potential underwriting risks for NEIL itself), it was agreed that I should contact you directly.

On December 15, 2006, FENOC, through its counsel, submitted to NEIL a report prepared by Exponent Failure Analysis Associates and Altran Solutions Corporation, entitled "Review and Analysis of the Davis-Besse March 2002 Reactor Pressure Vessel Head Wastage Event" ("Exponent Report"). The Exponent Report disagrees in a number of ways with the analysis presented in the Root Cause Analysis Report entitled "Significant Degradation of the Reactor Pressure Vessel Head" (CR 2002-0891) that FENOC submitted to the Nuclear Regulatory Commission ("NRC"). As just two examples, the Exponent Report states that the crack growth rate was significantly higher than that stated in the Root Cause Report and suggests higher metal removal rates under certain thermal hydraulic conditions than that presented in the Root Cause Report.

Indeed, in a number of places, the Exponent Report contains statements that directly call into question FENOC's conclusions in the Root Cause Report (and other submissions by FENOC to the NRC) with regard to the cause and timeline of the damage to the Davis-Besse reactor pressure vessel head. As an example, FENOC stated on page 24 of the Root Cause Report (August 27, 2002) that "the corrosion rate began to increase significantly starting at about 11 RFO [April 1998] and acted for a four year period of time." In contrast, the Exponent Report stated as follows:

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- ◊ "[w]e have concluded that the large wastage cavity found during the 13RFO inspection in March 2002 at Nozzle 3 could have formed in as little as a few weeks in the extreme of complete fluid cutting of the head." Exponent Report at 2-14.
- ◊ "[t]he development of the large crack at Davis-Besse Nozzle 3 and the subsequent wastage cavity development occurred in a much shorter time frame than the root cause report concluded." Exponent Report at 4-13.

NEIL has not yet had time to analyze in detail the assumptions, methodologies, models, analyses and conclusions reached in the 757 pages of the Exponent Report. However, we are concerned that if the theories postulated in the Exponent Report are indeed true, then there could be current implications for operating reactors at other NEIL Members, as well as FENOC's other PWRs.

In particular, Exponent's apparent position is that susceptible materials can have crack growth rates that are significantly higher than previously assumed and small through wall cracks can lead to high rates of erosion and corrosion. Material susceptibility and crack growth rates are one of the bases for the NRC's requirements for monitoring reactor coolant system unidentified leak rates during power operation, visual (bare metal) inspections of reactor pressure vessel heads during refueling outages, and periodic volumetric examination of penetrations. If the theories in the Exponent Report are correct, it could require reevaluation of the adequacy of these NRC requirements and the licensee programs implementing them to ensure that excessive degradation of a reactor pressure vessel head or other components could not occur in less than one operating cycle.

We recognize that the Exponent Report was prepared as part of an ongoing arbitration. At the same time, however, we are concerned about the possible consequences to the industry (as highlighted in the previous paragraph) that the report may cause. We therefore think it is important for NEIL's Members to know whether the opinions and conclusions set forth in the Exponent Report represent the position of FENOC with regard to the cause and timeline of the damage to the Davis-Besse reactor pressure vessel head.

One way of determining whether the Exponent Report represents FENOC's position is to look at the actions taken at Davis-Besse, as well as filings that FENOC may have made, or will make, with the NRC as a result of the Exponent Report. (Based on our search of the public records, we have not identified any such filing as of today) NEIL has retained as consultants a number of former senior NRC officials and obtained their input on FENOC's reporting requirements, if any, in connection with the Exponent Report. We have been informed that, if FENOC concurs with the conclusions in the Exponent Report that the prior root cause evaluation was in error or was non-conservative, the root cause report would have to be revised and resubmitted to NRC and the LER associated with the event would also need to be revised. In that regard, we note that the NRC's Confirmatory Action Letter to Davis-Besse Nuclear Power Station (CAL No. 3-02-001) dated March 13, 2002 imposed six sets of commitments FENOC had to undertake prior to restart, including "determine the root cause of the degradation around the RPV head penetrations." Because this item was closed out based on the root cause reports submitted by FENOC (see, e.g., NRC letter dated September 19, 2003), we are advised that FENOC would have to inform the NRC if it now disagrees with the conclusions that formed the basis for satisfying one of the items of the CAL.



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Before deciding on what actions we should take with our other Members about the safety concern discussed in this letter, we thought it prudent to contact you and request additional information on the actions that FENOC has taken in response to the opinions and conclusions in the Exponent Report. We therefore request that FENOC answer the following questions:

- 1) Has FENOC prepared a Condition Report and entered the Exponent Report into the Davis-Besse Corrective Action Program for analysis?
- 2) Has FENOC evaluated the opinions and conclusions in the Exponent Report with regard to what potential impact there might be on the various reports and analyses that were generated by FENOC to support restart of Davis-Besse?
- 3) Has FENOC evaluated its reporting obligations to the NRC with regard to the opinions and conclusions contained in the Exponent Report, and has FENOC contemplated, or is FENOC contemplating, submitting any reports to the NRC (such as a revised root cause report) based on the opinions and conclusions in the Exponent Report?
- 4) Has FENOC evaluated the opinions and conclusions in the Exponent Report for their potential impact on FENOC's response to the NRC's February 11, 2003 Order EA-03-009 with regard to the inspection plan for the refurbished Midland reactor pressure vessel head that was installed at Davis-Besse?
- 5) Has FENOC evaluated the opinions and conclusions in the Exponent Report for transportability to other systems and components at Davis-Besse that contain Alloy 600 (such as the pressurizer)?
- 6) Is FENOC planning on sharing the opinions and conclusions in the Exponent Report with the Institute for Nuclear Power Operations, the technical committees or programs of the Nuclear Energy Institute and the Electric Power Research Institute, or the various reactor owners' groups?

NEIL believes that FENOC's responses to the questions posed in this letter are important so that NEIL can have a better understanding of whether the opinions and conclusions in the Exponent Report present a current safety concern for other NEIL Members and whether NEIL should share the information in the Exponent Report with the NEIL Membership for review. Understanding the response by FENOC to the Exponent Report will assist us in this regard.

This matter will be a topic of substantive discussion at the upcoming NEIL Board meeting on March 9, 2007. We request that you respond before that time so that the Board can take such information into consideration in determining further steps, if any, that may be appropriate for NEIL or its Members.

I await your response, and if you have any questions about this letter, please feel free to give me a call.

Sincerely yours,

  
David B. Ripsom