

March 5, 2004

EA-03-172

Mr. Lew W. Myers  
Chief Operating Officer  
FirstEnergy Nuclear Operating Company  
Davis-Besse Nuclear Power Station  
5501 North State Route 2  
Oak Harbor, OH 43449-9760

SUBJECT: FINAL SIGNIFICANCE DETERMINATION FOR A WHITE FINDING AND  
NOTICE OF VIOLATION (NRC INSPECTION REPORT 50-346/04-05),  
DAVIS-BESSE NUCLEAR POWER STATION

Dear Mr. Myers:

The purpose of this letter is to provide you the final results of our significance determination of the finding involving the failure of FirstEnergy Nuclear Operating Company (FirstEnergy) to correctly design the high pressure injection (HPI) pumps for accident mitigation during the recirculation mode of emergency core cooling, discussed in Inspection Report 50-346/03-21, issued on October 8, 2003. The inspection finding was assessed using the Significance Determination Process (SDP) and was preliminarily characterized as a finding with greater than very low safety significance (Greater than Green). This deficiency could result in the inability of the HPI pumps to perform their safety function under certain accident scenarios due to potential pump degradation.

In our letter dated October 8, 2003, we provided FirstEnergy an opportunity to request a Regulatory Conference or provide a written response. Since preliminary significance analyses varied greatly depending on assumptions regarding the impact of sump debris on the reliability of the HPI pumps, the NRC October 8, 2003, letter requested that FirstEnergy provide additional information that would facilitate more refined risk analyses. Specifically requested information included: (1) failure probability of the HPI pumps when operating in the high pressure recirculation mode, including the impact of unqualified coatings in containment, the as-found degraded condition of peeling coatings, and transfer of those coatings and all other debris through containment and the sump to the HPI pumps; and (2) the contribution to risk due to plant fires. In a telephone conversation with Ms. C. Lipa of NRC, Region III, on October 16, 2003, Mr. D. Gudger of your staff indicated that FirstEnergy did not contest the characterization of the risk significance of this finding and that you declined your opportunity to discuss this issue in a Regulatory Conference. On November 7, 2003, FirstEnergy submitted a request for extension to December 5, 2003, to provide the NRC with additional information to facilitate more refined risk analysis.

On December 5, 2003, you provided Region III with the information requested in our October 8, 2003, letter to assist in the characterization of the risk significance of the Greater than Green finding. Your response specifically detailed a debris transport analysis that calculated the amount and type of debris that would be expected to be transported to the containment sump and ultimately to the HPI pump during the high pressure recirculation (HPR) mode of operation. It also provided an evaluation of the HPI pump performance (hydraulic and mechanical) after ingesting the available debris, using results of mock-up tests performed in support of the HPI pump modification project. Also provided were the results of your internal events and fire PRA analyses for the HPI pump design issue.

Your containment debris transport study concluded that the debris generated from a reactor coolant pump (RCP) seal loss of coolant accident (LOCA) or a long-term feed and bleed event (i.e., makeup/HPI cooling) upon loss of feedwater, would not be sufficient to render the HPI pumps incapable of performing their intended function. The NRC concluded that your transport analysis used appropriate methodologies and assumptions and we agreed with its conclusions.

Your risk analysis considered internal events, boron precipitation control, internal plant flooding, fire and seismic events. Generally, conservative assumptions were made regarding HPI pump capability when operating in the HPR mode. You performed a more detailed analysis of HPI pump capability for HPR following a loss-of-feedwater accident and an RCP seal LOCA. These events were selected for more detailed analysis based on their high contribution to core damage frequency (CDF) and the more limited debris generation and transport that was expected as concluded in the transport analysis.

The regional and NRR risk analysts reviewed your risk analysis and generally agreed with the methodology and assumptions. By performing the detailed debris transport analysis you were able to demonstrate that the amount of debris generated for HPR following a loss-of-feedwater accident or RCP seal LOCA would be limited by the location of the reactor coolant discharge into containment because containment spray would not be initiated during these accident conditions with at least one containment fan cooler in operation. Therefore, for these two accident scenarios, the nominal HPI pump failure probability was used in your PRA model. For events other than makeup/HPI cooling or RCP seal LOCAs, you chose not to quantify the debris generated; consequently, you conservatively assumed that the HPI pump failure probability was 1.0. The overall results of your risk analysis indicated that the change in CDF for this finding was approximately  $3E-6$ /year, which was dominated by fire scenarios. You stated in your analysis that the overall significance of the finding, considering the deficiency had existed since plant startup, was about  $5E-5$ . In order to be consistent with the Significance Determination Process, our assessment of the finding is evaluated and reported on a per year basis and was compared to your  $3E-6$ /year change in CDF.

The NRC analysts independently evaluated relevant accident scenarios using a modified Standardized Plant Analysis Risk (SPAR) model, Revision 3, and similar assumptions used by your analysis. This was done because, as stated previously, the analysts agreed that your approach was reasonable.

When combining the internal events analysis results from our SPAR analysis with your fire analysis, the total estimated risk of the performance deficiency is about  $6E-6$ , a White finding. In general, we determined that good correlation existed between your results and the SPAR model results. The change in the CDF from the SPAR model is considered somewhat conservative primarily due to our assumption that the HPI pumps would fail under all circumstances for small and medium LOCAs, whereas your analysis did not consider the HPI pump's failure for medium LOCAs. In addition, SPAR model data tends to be more conservative than data from licensees. Considering the SPAR analysis conservatism, the analysts determined that your analysis was reasonable and reflected the risk significance of the performance deficiency. Therefore, the overall significance of the finding was in the White range of importance. This represents a finding with low to moderate increased importance to safety, which may result in additional NRC inspection.

You have 30 calendar days from the date of this letter to appeal the staff's final determination of significance for the identified White finding. Such appeals will be considered to have merit only if they meet the criteria given in NRC Inspection Manual Chapter 0609, Significance Determination Process, Attachment 2.

The NRC has determined that the failure to adequately implement design control measures for verifying the adequacy of the design of the HPI pumps to mitigate all postulated accidents is a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," as cited in the attached Notice of Violation (Notice). The circumstances surrounding the violation are described in detail in Inspection Report 50-346/03-21. In accordance with the NRC Enforcement Policy, NUREG-1600, the Notice of Violation is considered escalated enforcement action because it is associated with a White finding.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so

L. Myers

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that it can be made available to the Public without redaction. The NRC also includes significant enforcement actions on its Web site at [www.nrc.gov](http://www.nrc.gov); select What We Do, Enforcement, then Significant Enforcement Actions.

Sincerely,

*/RA/*

James L. Caldwell  
Regional Administrator

Docket No. 50-346  
License No. NPF-3

Enclosure: Notice of Violation

cc w/encl: The Honorable Dennis Kucinich  
G. Leidich, President - FENOC  
Plant Manager  
Manager - Regulatory Affairs  
M. O'Reilly, Attorney, FirstEnergy  
Ohio State Liaison Officer  
R. Owen, Administrator, Ohio Department of Health  
Public Utilities Commission of Ohio  
President, Board of County Commissioners  
Of Lucas County  
C. Koebel, President, Ottawa County Board of Commissioners  
D. Lochbaum, Union Of Concerned Scientists  
J. Riccio, Greenpeace  
P. Gunter, N.I.R.S.

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NAME	Tschiltz **		J. Dixon-Herrity for Congel **		Grobe		Caldwell			
DATE	03/02/04		03/03/04		03/05/04		03/05/04			

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\* via R. Franovich telephone conversation with B. Clayton

\*\* via email to B. Clayton

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## NOTICE OF VIOLATION

First Energy Nuclear Operating Company  
Davis-Besse Nuclear Power Station

Docket No. 50-346  
License No. NPF-3  
EA-03-172

During an NRC inspection completed on October 8, 2003, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, the violation is listed below:

10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures be established to assure that the design basis for safety-related functions of structures, systems, and components are correctly translated into specifications, drawings, procedures, and instructions. Further, Criterion III requires that the design control measures shall provide for verifying or checking the adequacy of designs.

Contrary to the above, the licensee failed to adequately implement design control measures for verifying and checking the adequacy of the original design of the high pressure injection pumps (HPI) to mitigate all postulated accidents. Specifically, on October 22, 2002, with the reactor defueled and in an extended outage, the licensee identified a design deficiency regarding internal clearances of the HPI pumps. The safety related function of the HPI pumps is to inject water into the reactor coolant system from the containment emergency sump (via the low pressure injection pumps) during the recirculation phase of a loss of coolant accident. During this mode of operation the HPI pumps were susceptible to failure since the potential existed for debris from the sump to be transported to the HPI pumps and cause blockage of lubricating water to the pumps' hydrostatic bearing resulting in a loss of the HPI pumps due to excessive vibration, overheating, or both. This was an original design flaw that had existed since plant construction.

This violation is associated with a White Significance Determination Process finding.

Pursuant to the provisions of 10 CFR 2.201, FirstEnergy Nuclear Operating Company is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555 with a copy to the Regional Administrator, Region III, and a copy to the NRC Resident Inspector at the Davis-Besse Nuclear Power Plant, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken to avoid further violations; and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS), to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room). If personal, privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 05 day of March 2004