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January 23, 2015

L-15-003

10 CFR 50.73

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

SUBJECT:
Davis-Besse Nuclear Power Station
Docket Number 50-346, License Number NPF-3
Licensee Event Report 2014-004

Enclosed is Licensee Event Report (LER) 2014-004, "Deficiency in Loss of Coolant Accident Analysis Adversely Affected Predicted Peak Cladding Temperature." This LER is being reported in accordance with 10 CFR 50.73(a)(2)(ii)(B).

There are no regulatory commitments contained in this letter or its enclosure. The actions described represent intended or planned actions and are described for information only. If there are any questions or if additional information is required, please contact Mr. Patrick J. McCloskey, Manager, Site Regulatory Compliance, at (419) 321-7274.

Sincerely,

Raymond A. Lieb

GMW

Enclosure: LER 2014-004

cc: NRC Region III Administrator
NRC Resident Inspector
NRR Project Manager
Utility Radiological Safety Board

IE22
NRR

NRC FORM 366 (02-2014) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 01/31/2017

Estimated burden per response to comply with this mandatory collection request: 80 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

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4. TITLE

Deficiency in Loss of Coolant Accident Analysis Adversely Affected Predicted Peak Cladding Temperature

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER 05000
11	25	2014	2014	- 004 -	00	01	23	2015	FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*			
1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☒ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
100	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
Gerald M. Wolf, Supervisor, Nuclear Compliance	(419) 321-8001

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES *(If yes, complete EXPECTED SUBMISSION DATE).* ☒ NO				

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On November 25, 2014, with the Davis-Besse Nuclear Power Station (DBNPS) operating in Mode 1 at approximately 100 percent power, the fuel vendor for the DBNPS notified the FirstEnergy Nuclear Operating Company (FENOC) of the final evaluation results for a deficiency discovered in the thermal conductivity model computer codes. Accounting for the deficiency resulted in the predicted analytical Peak Cladding Temperature (PCT) for Large Break Loss of Coolant Accident Conditions increasing to an estimated 2513 degrees F, which is in excess of 2200 degrees F specified in 10 CFR 50.46(b)(1). Because the station had sufficient margin in the reactor core reload analysis and had previously implemented compensatory measures recommended by the fuel vendor when the potential issue was first identified, the deficiency had no impact on current plant operation or public health and safety. The cause of this event was related to the evolution of the fuel vendor's modeling.

This issue is being reported in accordance with 10 CFR 50.73(a)(2)(ii)(B) as an unanalyzed condition that significantly degraded plant safety.

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CONTINUATION SHEET

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NARRATIVE

DESCRIPTION OF EVENT:

On October 20, 2014, the fuel vendor (AREVA) for the Davis-Besse Nuclear Power Station (DBNPS) notified the FirstEnergy Nuclear Operating Company (FENOC) of a potential issue regarding Loss of Coolant Accident (LOCA) modeling. This issue, which potentially affected the operations of all Babcock and Wilcox (B&W) designed plants, involved the fuel pellet thermal conductivity model and associated conservatisms in the Large Break LOCA model. For the DBNPS, which was operating in Mode 1 at approximately 100 percent full power for the duration of this issue, adequate margin existed in the reactor core operating limits to accommodate temporary compensatory measures, in the form of restricted operating limits, while further evaluations were being performed.

On October 21, 2014, the fuel vendor transmitted temporary conservative limits on Power Peaking Factor Fq and Axial Power Imbalance (as measured by the Out-of-Core Neutron Detectors) for the DBNPS. The guidance provided by the fuel vendor recommended the Fq limits for higher burnup fuel assemblies be reduced, confirmed the limits on Axial Power Imbalance (as determined by the Incore Detector System) did not need to be changed due to conservatism built into the limits, and recommended that at less than 92 percent full power the limits on Axial Power Imbalance as determined from the out-of-core neutron detectors be reduced. This guidance was implemented at the DBNPS on October 23, 2014.

On November 25, 2014, the fuel vendor notified FENOC of the final evaluation results for the deficiency discovered in the thermal conductivity model computer codes. Accounting for the deficiency resulted in the predicted analytical Peak Cladding Temperature (PCT) increasing to 2513 degrees F during Large Break LOCA conditions. This 2513 degrees F exceeded the DBNPS licensing basis PCT of 2200 degrees F for compliance with 10 CFR 50.46(b)(1). Because of the recommended compensatory measures implemented on October 23, 2014, the deficiency had no impact on current plant operation or public health and safety.

CAUSE OF EVENT:

The cause of this event was related to the evolution of the fuel vendor's modeling. The fuel vendor's previous models for fuel rod thermal mechanical performance inadequately addressed the thermal conductivity degradation effect. The deficiency was identified while developing new computer models, which utilized updated data and incorporated a greater understanding of the fuel rod thermal mechanical performance.

ANALYSIS OF EVENT:

A methodology was developed by FENOC in collaboration with the fuel vendor to evaluate past core operating data. Implementation of this methodology determined that there were no actual fuel assembly power peaks observed during the last three years that would have resulted in peak clad temperatures in excess of analysis of record peak clad temperatures. Therefore, this issue was of very low safety significance.

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NARRATIVE

Reportability Discussion:

The NRC was verbally notified of this event per 10 CFR 50.72(b)(3)(ii)(B) at 1632 hours on November 25, 2014, via Event Number 50639. This issue is being reported in accordance with 10 CFR 50.73(a)(2)(ii)(B) as an unanalyzed condition that significantly degraded plant safety. Notification of the Defect in the LOCA Analysis in accordance with 10 CFR 21 was completed by the fuel vendor by letter dated December 16, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14351A308).

CORRECTIVE ACTIONS:

On December 19, 2014, notification of the error and change that affected the Large Break LOCA analysis for the DBNPS was submitted to the NRC in accordance with 10 CFR 50.46(a)(3)(ii) via FENOC letter L-14-403 (ADAMS Accession No. ML14353A228). This letter includes the schedule for the LOCA reanalysis and submittal to the NRC as required by 10 CFR 50.46.

PREVIOUS SIMILAR EVENTS:

There have been no Licensee Event Reports submitted for the DBNPS in the past three years documenting deficiencies in the Loss of Coolant Accident Analysis.