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Fax: 419-321-7582January 13, 2012
L-12-001

10 CFR 54

ATTN: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001**SUBJECT:**

Davis-Besse Nuclear Power Station, Unit No. 1
Docket No. 50-346, License Number NPF-3
Reply to Request for Additional Information for the Review of the Davis-Besse Nuclear Power Station, Unit No. 1, License Renewal Application (TAC No. ME4640) and License Renewal Application Amendment No. 23

By letter dated August 27, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML102450565), FirstEnergy Nuclear Operating Company (FENOC) submitted an application pursuant to Title 10 of the *Code of Federal Regulations*, Part 54 for renewal of Operating License NPF-3 for the Davis-Besse Nuclear Power Station, Unit No. 1 (DBNPS). By letter dated December 27, 2011 (ADAMS Accession No. ML11333A396), the Nuclear Regulatory Commission (NRC) requested additional information to complete its review of the License Renewal Application (LRA).

The Attachment provides the FENOC response to NRC request for additional information (RAI) 3.1.2.2.16-3 contained in the NRC letter dated December 27, 2011. The NRC request is shown in bold text followed by the FENOC response. The Enclosure provides Amendment No. 23 to the DBNPS LRA.

The FENOC responses to RAIs B.1.4-2 and B.1.4-3 are planned to be provided to the NRC by February 29, 2012, as they require additional time for development of the responses due to coordination with multiple site and Fleet departments. The FENOC response to RAI B.2.39-13 is planned to be provided to the NRC by March 30, 2012, following completion of the Davis-Besse Shield Building concrete cracking Root Cause Evaluation scheduled for February 28, 2012, as confirmed in NRC confirmatory action letter CAL No. 3-11-001, dated December 2, 2011.

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There are no regulatory commitments contained in this letter. If there are any questions or if additional information is required, please contact Mr. Clifford I. Custer, Fleet License Renewal Project Manager, at 724-682-7139.

I declare under penalty of perjury that the foregoing is true and correct. Executed on January 13, 2012.

Sincerely,



Barry S. Allen

Attachment:

Reply to Request for Additional Information for the Review of the Davis-Besse Nuclear Power Station, Unit No. 1 (DBNPS), License Renewal Application, Section 3.1.2.2

Enclosure:

Amendment No. 23 to the DBNPS License Renewal Application

cc: NRC DLR Project Manager
NRC Region III Administrator

cc: w/o Attachment or Enclosure
NRC DLR Director
NRR DORL Project Manager
NRC Resident Inspector
Utility Radiological Safety Board

Attachment
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Reply to Request for Additional Information for the Review of the
Davis-Besse Nuclear Power Station, Unit No. 1 (DBNPS), License Renewal Application,
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Section 3.1.2.2

Question RAI 3.1.2.2.16-3

Background

By letter dated November 23, 2011, the applicant responded to RAI 3.1.2.2.16-2, which addresses the extent and method of the inspections to manage cracking due to primary water stress corrosion cracking (PWSCC) of the steam generator (SG) tube-to-tubesheet welds. In its response, the applicant indicated that a gross visual inspection coupled with eddy-current inspections will be performed on the SG tube-to-tubesheet welds. The applicant also indicated that the inspection schedule will be concurrent with the eddy-current inspections of the SG tubes in accordance with Davis-Besse Technical Specification 5.5.8, "Steam Generator (SG) Program." The applicant further indicated that at a minimum, 100% of the tubes are inspected at sequential periods of 60 effective full power months.

Issue

In its review, the staff noted that it is not clear whether the gross visual inspection of the tube-to-tubesheet welds will include the welds on the hot leg, cold leg, or both legs. The staff also needs more clarifications on the extent and method of the visual inspection addressed in the applicant's response.

Request

- 1. Clarify whether the visual inspection will be conducted on the welds on the hot leg, cold leg, or both legs. In addition, describe the extent of the visual inspection (i.e., what percentage of the welds will be inspected), and clarify whether the visual inspection will be conducted on each tube-to-tubesheet weld.**
- 2. Provide information on the objective, equipment, and method of the visual inspections.**

RESPONSE RAI 3.1.2.2.16-3

1. The extent of the gross visual inspection will be 100% of the steam generator tube-to-tubesheet welds (includes both the hot leg and cold leg welds). Gross visual inspection of the tube-to-tubesheet welds will be scheduled concurrent with eddy-current inspection of the steam generator tubes that are scheduled in accordance with Davis-Besse Technical Specification 5.5.8. At a minimum, 100% of the tubes are inspected at sequential periods of 60 effective full power months, and therefore, at a minimum, 100% of the tube-to-tubesheet welds (includes both the hot leg and cold leg welds) will be inspected at sequential periods of 60 effective full power months.
2. The gross visual inspection of the tube-to-tubesheet welds will consist of a remote-visual examination using a manipulator camera to obtain a straight-on view of the weld with a visual acuity sufficient to detect evidence of degradation. The gross visual inspections will be performed by personnel who are qualified for American Society of Mechanical Engineers (ASME) code visual examination (i.e., are certified VT-1 or VT-3 examiners) and are knowledgeable in the type of tube-to-tubesheet welds being examined (i.e., fillet welds).

LRA Sections A.1.38 and B.2.38, both titled "Steam Generator Tube Integrity Program," and LRA Table A-1, "Davis-Besse License Renewal Commitments," license renewal future Commitment number 25, are revised consistent with this response.

See the Enclosure to this letter for the revision to the DBNPS LRA.

Enclosure

Davis-Besse Nuclear Power Station, Unit No. 1 (DBNPS)

Letter L-12-001

Amendment No. 23 to the DBNPS License Renewal Application

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License Renewal Application Sections Affected

Section A.1.38

Table A-1

Section B.2.38

The Enclosure identifies the change to the License Renewal Application (LRA) by Affected LRA Section, LRA Page No., and Affected Paragraph and Sentence. The count for the affected paragraph, sentence, bullet, etc. starts at the beginning of the affected Section or at the top of the affected page, as appropriate. Below each section the reason for the change is identified, and the sentence affected is printed in *italics* with deleted text ~~*lined-out*~~ and added text *underlined*.

<u>Affected LRA Section</u>	<u>LRA Page No.</u>	<u>Affected Paragraph and Sentence</u>
A.1.38	Pages A-24 & A-25	3 rd Paragraph

In response to RAI 3.1.2.2.16-3, the third paragraph of LRA Section A.1.38, "Steam Generator Tube Integrity Program," previously revised in response to RAI 3.1.2.2.16-2 by FENOC letter dated November 23, 2011 (ML11335A223), is replaced in its entirety to read as follows:

In addition, cracking due to PWSCC is managed for the steam generator tube-to-tubesheet welds (Alloy 600) by a combination of the PWR Water Chemistry Program and the Steam Generator Tube Integrity Program. The PWR Water Chemistry Program controls peak levels of various contaminants (e.g., dissolved oxygen, chlorides, fluorides, and sulfates) below the system-specific limits that can accelerate cracking for nickel-alloy components. The Steam Generator Tube Integrity Program includes gross visual inspection of the steam generator tube-to-tubesheet welds coupled with eddy-current inspection (i.e., bobbin coil or rotating coil examinations) of the tubes to monitor for cracking and degradation of the tube-to-tubesheet welds (Alloy 600). The gross visual inspection of the tube-to-tubesheet welds are scheduled concurrent with eddy-current inspection of the steam generator tubes that are scheduled in accordance with Davis-Besse Technical Specification 5.5.8. At a minimum, 100% of the tubes are inspected at sequential periods of 60 effective full power months, and therefore, at a minimum, 100% of the tube-to-tubesheet welds (includes both the hot leg and cold leg welds) are inspected at sequential periods of 60 effective full power months. The gross visual inspection of the tube-to-tubesheet welds consists of a remote-visual examination using a manipulator camera to obtain a straight-on view of the weld with a visual acuity sufficient to detect evidence of degradation. The gross visual examinations are performed by personnel who are qualified for American Society of Mechanical Engineers (ASME) code visual examination (i.e., are certified VT-1 or VT-3 examiners) and are knowledgeable in the type of tube-to-tubesheet welds being examined (i.e., fillet welds). Acceptance criteria for the gross visual inspections and the eddy-current inspections consist of no indication of cracking or relevant conditions of degradation. Should the steam generators be replaced in the future with a design such that the tubes, tubesheet cladding and tube-to-tubesheet welds are fabricated of Alloy 690 material, only the PWR Water Chemistry Program will manage cracking due to PWSCC of the tube-to-tubesheet welds and the gross visual inspection will no longer be required.

Affected LRA Section LRA Page No. Affected Paragraph and Sentence

Table A-1 Page A-69 Commitment No. 25

In response to RAI 3.1.2.2.16-3, LRA Table A-1, "Davis-Besse License Renewal Commitments," license renewal future Commitment No. 25, previously revised in response to RAI 3.1.2.2.16-2 by FENOC letter dated November 23, 2011 (ML11335A223), is replaced in its entirety to read as follows:

Table A-1 Davis-Besse License Renewal Commitments				
Item Number	Commitment	Implementation Schedule	Source	Related LRA Section No./ Comments
25	<p><u>Enhance the Steam Generator Tube Integrity Program to:</u></p> <ul style="list-style-type: none"> <u>Include gross visual inspection of the steam generator tube-to-tubesheet welds coupled with eddy-current inspection (i.e., bobbin coil or rotating coil examinations) of the tubes to monitor for cracking and degradation of the tube-to-tubesheet welds (Alloy 600). Schedule the gross visual inspection of the tube-to-tubesheet welds concurrent with eddy-current inspection of the steam generator tubes that are scheduled in accordance with Davis-Besse Technical Specification 5.5.8 such that 100% of the tube-to-tubesheet welds (includes both the hot leg and cold leg welds) are inspected at sequential periods of 60 effective full power months. Perform the gross visual inspection of the tube-to-tubesheet welds through remote-visual examination using a manipulator camera to obtain a straight-on</u> 	<p><u>Prior to April 22, 2017</u></p>	<p><u>LRA and FENOC Letter L-12-001</u></p>	<p><u>A.1.38</u> <u>B.2.38</u> <u>Response to NRC RAI 3.1.2.2.16-3 from NRC Letter dated December 27, 2011</u></p>

**Table A-1
 Davis-Besse License Renewal Commitments**

Item Number	Commitment	Implementation Schedule	Source	Related LRA Section No./ Comments
	<u>view of the weld with a visual acuity sufficient to detect evidence of degradation. Perform the gross visual inspections using personnel who are qualified for American Society of Mechanical Engineers (ASME) code visual examination (i.e., are certified VT-1 or VT-3 examiners) and are knowledgeable in the type of tube-to-tubesheet welds being examined (i.e., fillet welds). Define the acceptance criteria for the gross visual inspections and the eddy-current inspections as no indication of cracking or relevant conditions of degradation.</u>			

<u>Affected LRA Section</u>	<u>LRA Page No.</u>	<u>Affected Paragraph and Sentence</u>
B.2.38	Page B-151	Program Description subsection, 4 th paragraph; and, Enhancements subsection

In response to RAI 3.1.2.2.16-3, LRA Section B.2.38, "Steam Generator Tube Integrity Program," the fourth paragraph of subsection "Program Description" and the "Enhancements" subsection, previously added in response to RAI 3.1.2.2.16-2 by FENOC letter dated November 23, 2011 (ML11335A223), are replaced in their entirety to read as follows:

[Program Description, 4th paragraph]

In addition, cracking due to PWSCC will be managed for the steam generator tube-to-tubesheet welds (Alloy 600) by a combination of the PWR Water Chemistry Program and the Steam Generator Tube Integrity Program. The PWR Water Chemistry Program controls peak levels of various contaminants (e.g., dissolved oxygen, chlorides, fluorides, and sulfates) below the system-specific limits that can accelerate cracking for nickel-alloy components. The Steam Generator Tube Integrity Program will include gross visual inspection of the steam generator tube-to-tubesheet welds coupled with eddy-current inspection (i.e., bobbin coil or rotating coil examinations) of the tubes to monitor for cracking and degradation of the tube-to-tubesheet welds (Alloy 600). The gross visual inspection of the tube-to-tubesheet welds will be scheduled concurrent with eddy-current inspection of the steam generator tubes that are scheduled in accordance with Davis-Besse Technical Specification 5.5.8. At a minimum, 100% of the tubes are inspected at sequential periods of 60 effective full power months and therefore, at a minimum, 100% of the tube-to-tubesheet welds (includes both the hot leg and cold leg welds) will be inspected at sequential periods of 60 effective full power months. The gross visual inspection of the tube-to-tubesheet welds will consist of a remote-visual examination using a manipulator camera to obtain a straight-on view of the weld with a visual acuity sufficient to detect evidence of degradation. The gross visual inspections will be performed by personnel who are qualified for American Society of Mechanical Engineers (ASME) code visual examination (i.e., are certified VT-1 or VT-3 examiners) and are knowledgeable in the type of tube-to-tubesheet welds being examined (i.e., fillet welds). Acceptance criteria for the gross visual inspections and the eddy-current inspections will consist of no indication of cracking or relevant conditions of degradation. Should the steam generators be replaced in the future with a design such that the tubes, tubesheet cladding and tube-to-tubesheet welds are fabricated of Alloy 690 material, only the PWR Water Chemistry Program will manage cracking due to PWSCC of the

tube-to-tubesheet welds and the gross visual inspection will no longer be required.

Enhancements

The following enhancement will be implemented in the identified program elements prior to the period of extended operation.

- **Scope, Parameters Monitored or Inspected, Detection of Aging Effects, Acceptance Criteria**

The Steam Generator Tube Integrity Program will include gross visual inspection of the steam generator tube-to-tubesheet welds coupled with eddy-current inspection (i.e., bobbin coil or rotating coil examinations) of the tubes to monitor for cracking and degradation of the tube-to-tubesheet welds (Alloy 600). The gross visual inspection of the tube-to-tubesheet welds will be scheduled concurrent with eddy-current inspection of the steam generator tubes that are scheduled in accordance with Davis-Besse Technical Specification 5.5.8. At a minimum, 100% of the tubes are inspected at sequential periods of 60 effective full power months and therefore, at a minimum, 100% of the tube-to-tubesheet welds (includes both the hot leg and cold leg welds) will be inspected at sequential periods of 60 effective full power months. The gross visual inspection of the tube-to-tubesheet welds will consist of a remote-visual examination using a manipulator camera to obtain a straight-on view of the weld with a visual acuity sufficient to detect evidence of degradation. The gross visual inspections will be performed by personnel who are qualified for American Society of Mechanical Engineers (ASME) code visual examination (i.e., are certified VT-1 or VT-3 examiners) and are knowledgeable in the type of tube-to-tubesheet welds being examined (i.e., fillet welds). Acceptance criteria for the gross visual inspections and the eddy-current inspections will consist of no indication of cracking or relevant conditions of degradation. Should the steam generators be replaced in the future with a design such that the tubes, tubesheet cladding and tube-to-tubesheet welds are fabricated of Alloy 690 material, only the PWR Water Chemistry Program will manage cracking due to PWSCC of the tube-to-tubesheet welds and the gross visual inspection will no longer be required.