FENOC
FirstEnergy Nuclear Operating Company

5501 North State Route 2
Oak Harbor, Ohio 43449

Barry S. Allen
Vice President - Nuclear

419-321-7676
Fax: 419-321-7582

October 7, 2011
L-11-292

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), License Renewal Application Amendment No. 19, and Revised License Renewal Application Boundary Drawings

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 August 11, 2011 (ADAMS Accession No. ML11216A236), the Nuclear Regulatory Commission (NRC) requested additional information to complete its review of the License Renewal Application (LRA).

The content and submittal date of this letter was discussed during telephone conferences with Mr. Samuel Cuadrado de Jesus, NRC Project Manager, and the submittal date was deferred to a mutually agreeable submittal date of October 7, 2011. Attachment 1 provides the FENOC reply to NRC requests for additional information (RAIs), in the order listed as follows:

1 of 3 RAIs in NRC letter dated August 11, 2011 (ML11216A236)
— Includes RAI 4.3.2.3.2-1 – (Supplement)

6 Supplemental RAI responses from NRC-initiated telephone conferences
— Includes supplemental responses for RAIs 3.3.2.14-1, Table 3.1.2-3, 4.6-1, B.2.22-7, B.2.29-11, and 3.2.2.2.3.6-2

6 Supplemental RAI responses from NRC Region III Inspector open items identified during the Inspection Procedure IP-71002 License Renewal Inspection
— Includes supplemental responses for the following RAIs:
- Open Item Number (OIN)-363 (containment vessel surfaces)
- OIN-377 (Accessible cables)

A145
NRR

- OIN-378 (Crane cycles time-limited aging analysis)
- OIN-379 (Water Control Structures Inspection acceptance criteria)
- OIN-381 (Yard and Switchyard Towers)
- OIN-382 (Elastomeric vibration isolators)

The NRC request is shown in bold text in Attachment 1 followed by the FENOC response.

The responses to the remaining 2 of 3 RAIs in NRC letter dated August 11, 2011 (ML11216A236), were provided in FENOC letter dated September 16, 2011 (ML11264A059).

The 6 supplemental RAIs from NRC-initiated telephone conference calls originated during calls held on September 13, 16 and 29, 2011, as described in Attachment 1.

The 6 Supplemental RAIs from the NRC Region III Inspector open items originated during the IP-71002 License Renewal Inspection held the weeks of April 25, May 9, and August 22, 2011.

Attachment 2 provides a commitment to perform a fatigue evaluation of selected Class 1 valves and submit an amendment to the Davis-Besse License Renewal Application (LRA). Enclosure A provides Amendment No. 19 to the DBNPS LRA. Enclosure B provides a revised LRA boundary drawing.

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 October 7, 2011.

Sincerely,

Barry S. Allen

Attachments:
1. Reply to Request for Additional Information for the Review of the Davis-Besse Nuclear Power Station, Unit No. 1 (DBNPS), License Renewal Application, Sections 2.4, 3.1.2, 3.2.2, 3.3.2, 3.5.2, 4.3.2, 4.6, 4.7, B.2.12, B.2.22, B.2.39 and B.2.40
2. Regulatory Commitment List

Enclosures:
A. Amendment No. 19 to the DBNPS License Renewal Application
B. Revised DBNPS License Renewal Application Boundary Drawing

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

Section 4.3.2

Question RAI 4.3.2.3.2-1 – (Supplement)

Background:

By letter dated June 22, 2011, the applicant responded to RAI 4.1-1 regarding cumulative usage factor (CUF) or I_t fatigue analyses for Class 1 valves. In its response to RAI 4.1-1, Request 1, Part A, the applicant identified 12 large bore Class 1 valves (i.e., valves with nominal pipe sizes in excess of 4-inches) that should have received CUF or I_t fatigue analyses in accordance with the design codes (i.e., 1971 or more recent Editions of the ASME Code Section III, or the 1968 Edition of the Draft ASME Pump and Valve Code for Nuclear Power Plants). The applicant provided Commitment No. 46 to complete the following, prior to April 22, 2015:

> **FENOC commits to perform a fatigue evaluation in accordance with the requirements of the ASME Code of record for the Davis-Besse Class 1 valves that are greater than 4 inches nominal pipe size. The applicable valve identification numbers are CF28, CF29, CF30, CF31, DH76, DH77, DH11, DH12, DH1A, DH1B, DH21, and DH23.**

LRA Section 4.3.2.3.2, as amended by letter dated June 22, 2011, states that the fatigue analyses for these 12 referenced large bore Class 1 valves are as TLAAs and are dispositioned in accordance with Title 10 of the Code of Federal Regulations 54.21(c)(1)(iii), that the effects of fatigue on Class 1 valves greater than 4 inches diameter nominal pipe size will be managed for the period of extended operation by the Fatigue Monitoring Program. LRA Section 4.3.2.3.2 also states that the issue with the missing CUF or I_t calculations for the 12 referenced large bore Class 1 valves has been entered into the applicant's Corrective Actions Program.

Issue:

The information provided by the applicant in letter of June 22, 2011, did not provide information regarding whether the applicant had any ASME Code, Section III NB-3222.4(d) fatigue waiver assessments (or equivalent waiver assessments permitted by the 1968 Draft ASME Pump and Valve Code) for the 12 large bore Class 1 valves referenced in Commitment No. 46. Therefore, the

staff requests additional information regarding whether fatigue calculations are required for these valves.

The staff is concerned that without the CUF or I_t analyses or an appropriate fatigue waiver or exemption for these 12 large bore Class 1 valves, the staff would not be able to evaluate whether the aging effects will be appropriately managed by the commitment.

Request:

Provide justification for not having the analyses for staff review as part of the LRA, or provide your appropriate fatigue waiver or fatigue exemption bases for not having such analyses.

RESPONSE RAI 4.3.2.3.2-1 - (Supplement)

As provided in FENOC letter dated July 22, 2011 (ML11208C274), a search of the Davis-Besse records did not locate fatigue evaluations for the subject Class 1 valves, and the issue of missing records had been documented in the FENOC Corrective Action Program for resolution. In the July 22, 2011, letter, license renewal future Commitment 46 was provided in LRA Appendix A with an implementation date of "prior to April 22, 2015," to perform a fatigue evaluation in accordance with the requirements of the ASME Code of Record for the Davis-Besse Class 1 valves greater than 4 inches diameter nominal pipe size.

However, to provide the fatigue evaluation in a timely manner to support development of the Davis-Besse license renewal safety evaluation, FENOC withdraws license renewal future Commitment 46 of LRA Appendix A, and instead provides a new regulatory commitment as follows:

> FENOC will perform a fatigue evaluation in accordance with the requirements of the ASME Code of record for the Davis-Besse Class 1 valves that are greater than 4 inches diameter nominal pipe size. The applicable valve identification numbers are CF28, CF29, CF30, CF31, DH76, DH77, DH11, DH12, DH1A, DH1B, DH21 and DH23. LRA Sections 4.3.2.3.2 and A.2.3.2.13, both titled "Class 1 Valves Fatigue," will be revised to include the results of the fatigue evaluations, and these changes will be submitted as an amendment to the Davis Besse LRA no later than May 31, 2012.

See Attachment 2 to this letter for the regulatory commitment.

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

Section 3.3.2

Question RAI 3.3.2.14-1

Background:

The GALL Report states that stainless steel components exposed to steam are susceptible to loss of material and stress corrosion cracking. In LRA Table 3.3.2-14, the fire water storage tank heat exchanger contains stainless steel tubes exposed to steam that are being managed for reduction in heat transfer. However, the applicant has not identified loss of material or stress corrosion cracking as applicable aging effects, as discussed in the GALL Report.

Issue:

Even though the heat exchanger tubes license renewal function is heat transfer, both loss of material and stress corrosion cracking could affect the intended function. It is unclear to the staff why the applicant has not included both loss of material and stress corrosion cracking as applicable aging effects.

Request:

Justify why loss of material and stress corrosion cracking are not applicable aging effects for the fire water storage tank heat exchanger tubes exposed to steam. If it is determined that both loss of material and stress corrosion cracking are applicable, provide information on how these aging effects will be managed.

RESPONSE RAI 3.3.2.14-1

The NRC initiated a telephone conference call with FENOC on September 13, 2011, to discuss the FENOC response to RAI 3.3.2.14-1 submitted under FENOC letter dated August 26, 2011 (ML11242A166), and requested a revised response to the RAI. FENOC replaces the previous response to RAI 3.3.2.14-1 in its entirety with the following information.

The fire water storage tank heat exchanger and recirculation pump are not within the scope of license renewal since the subject components do not satisfy the scoping criteria of 10 CFR 54.4(a)(1), (a)(2), or (a)(3). The heat exchanger and the recirculation pump are used to establish initial conditions associated with event assumptions, and perform no fire protection functions. Hence it is the monitoring of the Fire Water Storage Tank that is credited with ensuring the appropriate initial conditions and therefore, the heat exchanger and recirculation pump are not in the scope of License Renewal for the Fire Protection regulated event.

The LRA is revised to delete information associated with the following components:

- Heat Exchanger (channel, shell, and tubesheet) – Fire water storage tank heat exchanger (DB-E52);
- Heat Exchanger (tubes) – Fire water storage tank heat exchanger (DB-E52); and,
- Pump Casing – Fire water storage tank recirculation pump (DB-P114).

License Renewal Boundary Drawing LR-M016A, "Station Fire Protection System," is revised to remove highlighting of the piping and components associated with the Fire Water Storage Tank Heat Exchanger (E52) and Fire Water Storage Tank Recirc Pump 1-1.

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

See Enclosure B to this letter for the revision to the LRA Boundary Drawings.

Section 3.1.2

Supplemental Question RAI Table 3.1.2-3

The NRC initiated a telephone conference call with FENOC on September 13, 2011, to discuss whether an aging management review (AMR) row was missing for the reactor vessel flange leakage detection line. The NRC reviewer noted that a line item for the dissimilar metal weld was not readily identifiable.

SUPPLEMENTAL RESPONSE RAI TABLE 3.1.2-3

FENOC has confirmed that a nickel-alloy weld connects the flange leakage detection line to the reactor pressure vessel closure flange tap. Therefore, LRA Table 3.1.2-3, "Aging Management Review Results – Reactor Coolant System and Reactor Coolant Pressure Boundary," is revised to provide a separate line item along with the aging management review results for the subject nickel-alloy weld.

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

Section 4.6

Supplemental Question RAI 4.6-1

The NRC initiated a telephone conference call with FENOC on September 13, 2011, to discuss the FENOC response to RAI 4.6-1 submitted under FENOC letter dated August 17, 2011 (ML11231A966).

Based on the telephone conference, FENOC agreed to provide a supplemental response to RAI 4.6-1 to include the basis for the 400 pressure and 400 temperature cycles and the pressure range of -0.67 to 45 psig in LRA Appendix A, "Updated Safety Analysis Report Supplement." In addition, the NRC noted that, in the original LRA submittal, the pressure range for the fatigue waiver analysis was shown as -25 to 120 pounds per square inch (psi), whereas the range provided in the FENOC response to RAI 4.6-1 was -25 to 20 psi. FENOC agreed to provide a supplemental response to clarify that the pressure range of -25 to 120 psi provided in the LRA submittal was a typographical error and that the correct pressure range is -25 to 20 psi.

SUPPLEMENTAL RESPONSE RAI 4.6-1

LRA Sections 4.6.1 and A.2.5.1, both titled, "Containment Vessel," are revised to include details from the fatigue waiver information provided in the response to RAI 4.6-1 submitted under FENOC letter dated August 17, 2011 (ML11231A966), and to state that the 400 cycles were based on a conservative estimate of anticipated cycles for 40 years of operation.

In addition, LRA Sections 4.6.1 and A.2.5.1 are revised to state that the adjusted pressure range of -0.67 to 45 psig is based on the containment vessel design allowable negative pressure of -0.67 psig and the containment vessel pneumatic test pressure of 45 psig (design pressure of 36 psig times 1.25).

The containment vessel pressure cycle range of -25 to 120 psi stated in Sections 4.6.1 and A.2.5.1 of the original LRA submittal was a typographical error, and should have read -25 to 20 psi. However, the pressure range of -25 to 120 psi has since been replaced with the adjusted pressure range of -0.67 to 45 psig in LRA Sections 4.6.1 and A.2.5.1 in response to RAI 4.6-1 in FENOC letter dated August 17, 2011 (ML11231A966).

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

Section B.2.22

Supplemental Question RAI B.2.22-7

The NRC initiated a telephone conference call with FENOC on September 13, 2011, to discuss the FENOC response to RAI B.2.22-7 submitted in FENOC letter dated August 17, 2011 (ML11231A966). The NRC noted that, in the RAI response, FENOC provided a commitment to enhance the Inservice Inspection (ISI) – IWE Program to perform examinations prior to the period of extended operation to monitor for cracking of stainless steel containment penetration sleeves, dissimilar metal welds, bellows, and steel components that are subject to cyclic loading, but have no current licensing basis fatigue analysis.

The NRC Staff noted that the frequency for the inspections was not specified, and asked for discussion of the inspection frequency. FENOC stated that the inspection frequency is planned to occur once each 10-year ISI interval; the inspections would be ISI augmented inspections. Also, the representative sample size is planned to be 10 percent of the scope. FENOC mentioned that the general condition of the penetration is noted during Appendix J testing. In addition, FENOC stated that penetration fatigue analyses may be developed in lieu of inspections.

The NRC reviewer requested an LRA change/commitment to document the frequency, sample size, basis for sample size, and to emphasize the use of Appendix J testing. In addition, FENOC should consider clarifying that fatigue analyses, if later performed for these penetration components, would then remove the requirement to perform examinations for cracking. FENOC agreed to provide the requested information.

The NRC initiated a follow-up telephone conference call with FENOC on September 16, 2011, to request that FENOC also address scheduling of the subject inspections. FENOC agreed to provide the requested information.

SUPPLEMENTAL RESPONSE RAI B.2.22-7

LRA Section B.2.22, "Inservice Inspection (ISI) Program – IWE," is revised to add a license renewal enhancement to the Inservice Inspection (ISI) Program – IWE to include surface examinations to monitor for cracking of stainless steel penetration sleeves, dissimilar metal welds, bellows, and steel components that are subject to cyclic loading but have no current licensing basis fatigue analysis.

In addition, the 10 CFR Part 50 Appendix J Program requires verification that a general visual inspection of the accessible interior and exterior surfaces of the

primary containment and components (includes penetrations) has been performed prior to the integrated leak rate test (ILRT) pressurization to identify evidence of structural deterioration that might affect either the primary containment structural integrity or leak tightness.

A review of Davis-Besse operating experience has not identified any instances of cracking of the stainless steel penetration sleeves, dissimilar metal welds, bellows, and steel components associated with the containment penetrations. Therefore, the containment penetration inspection sample size will include 10 percent of the subject containment penetration population or a maximum of 25, whichever is less. In this case the 10 percent applies since the penetration population is less than 250. The 10 percent sample size is consistent with other NUREG-1801 programs where the inspection is designed to provide assurance that aging is not occurring. Penetrations included in the inspection sample will be scheduled for examination in each 10-year ISI interval that occurs during the period of extended operation.

By letter dated August 17, 2011 (ML11231A966), FENOC provided license renewal future Commitment 47 to enhance the Inservice Inspection (ISI) Program - IWE to include examinations to monitor for cracking of stainless steel containment penetration sleeves, dissimilar metal welds, bellows, and steel components that are subject to cyclic loading but have no current licensing basis fatigue analysis. Commitment 47 is revised to clarify that, should fatigue analyses be performed in the future for the containment penetrations, the examinations will no longer be required.

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

Section B.2.39

Supplemental Question RAI B.2.39-11

The NRC initiated a telephone conference call with FENOC on September 13, 2011, to discuss the FENOC response to RAI B.2.39-11 submitted in FENOC letter dated August 26, 2011 (ML11242A166), regarding groundwater effects to concrete structures. The NRC deemed the information in the response acceptable, except that implementation by April 2017 is not acceptable. The NRC reviewer questioned whether the evaluation of core bores could occur and be dispositioned as early as 2014.

SUPPLEMENTAL RESPONSE RAI B.2.39-11

FENOC agrees that implementation of core bores of concrete structures can occur by the end of year 2014. LRA Table A-1, "Davis-Besse License Renewal Commitments," license renewal future Commitments 20 and 26, are revised to change the implementation schedule for core bores and evaluation of concrete due to aggressive groundwater from April 22, 2017 to December 31, 2014.

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

Section 3.2.2.2.3.6

Supplemental Question RAI 3.2.2.2.3.6-2

On September 21, 2011, the NRC questioned the changes made in response to Supplemental RAI 3.2.2.2.3.6-2 to LRA Table 3.3.2-26, "Aging Management Review Results – Service Water System," row 83, and Table 3.3.2 27, "Aging Management Review Results – Spent Fuel Pool Cooling and Cleanup System," row 38, provided in FENOC letter dated September 16, 2011 (ML11264A059). Specifically, the NRC staff noted that, following a line-by-line comparison of the tables to the LRA, the environments listed in two of the revised rows appeared to be incorrect.

Additionally, the NRC initiated a telephone conference call with FENOC on September 29, 2011, to address the response to Supplemental RAI 3.2.2.2.3.6-2. In its response dated September 16, 2011 (ML11264A059), the applicant stated the following:

> **"Furthermore, the LRA is revised to define the moist air (internal) environment to encompass both the air-water interface and the air environment above the interface. In conclusion, the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Program manages loss of material (except for selective leaching) and cracking for all in scope components subject to a moist air environment."**

The NRC reviewer noted that changes to the associated aging management review rows seemed to be as expected. However, the reviewer had a question on rows 25 and 32 of LRA Table 3.3.2-27. The rows are for the stainless steel piping with an environment of "Air-indoor uncontrolled (internal)" and the reviewer requested that FENOC confirm that these rows are not associated with an air-water interface, and that no changes to these rows are needed.

SUPPLEMENTAL RESPONSE RAI 3.2.2.2.3.6-2

FENOC agrees that the environments listed in LRA Table 3.3.2-26, "Aging Management Review Results – Service Water System," row 83, and Table 3.3.2 27, "Aging Management Review Results – Spent Fuel Pool Cooling and Cleanup System," row 38, in FENOC letter dated September 16, 2011 (ML11264A059), were inadvertently changed from "Moist air (External)" to "Moist air (Internal)." LRA Tables 3.3.2-26 and 3.3.2-27 are revised to include the correct "Moist air (External)" environment.

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

Rows 25 and 32 of LRA Table 3.3.2-27 are not associated with an air-water interface.

Row 25 is applicable to stainless steel drain piping in scope for 10 CFR 54.4(a)(1). The fuel transfer tubes contain vents, drains and test connections with valves that are normally closed. Therefore, piping located downstream from these valves is open to the ambient atmosphere and evaluated as "Air-indoor uncontrolled (Internal)."

Row 32 is applicable to stainless steel overflow piping in scope for 10 CFR 54.4(a)(2). The spent fuel pool overflow piping has an inlet at a higher elevation than the normal spent fuel pool water surface level. Therefore, spent fuel pool water does not normally enter the overflow piping. This piping is open to the ambient atmosphere and is evaluated as "Air-indoor uncontrolled (Internal)."

Therefore, no changes are required to LRA Table 3.3.2-27 for rows 25 and 32.

Section 3.5.2

Supplemental Question RAI OIN-363 (Containment Vessel Surfaces)

FENOC generated Open Item Number OIN-363 during the NRC Region III Inspection Procedure IP-71002, "License Renewal Inspection," held during the week of May 9, 2011, to address an Inspector request regarding containment vessel surfaces. NRC Region III letter dated June 27, 2011, "Davis-Besse Nuclear Power Station NRC License Renewal Scoping, Screening, and Aging Management Inspection Report 05000346/2011010" (ML11179A134), states that, "The inspectors also identified the environment and aging mechanisms affecting the exterior containment vessel surface were not explicitly defined in the LRA or in NUREG-1801. The applicant issued OIN-363 to track an update of the LRA to identify the 10 CFR 50 Appendix J Program for management of both internal and external containment vessel surfaces."

SUPPLEMENTAL RESPONSE RAI OIN-363 (CONTAINMENT VESSEL SURFACES)

Row No. 5 of LRA Table 3.5.2-1, "Aging Management Review Results – Containment," addresses the Davis-Besse carbon steel containment vessel in an "air-indoor" environment. FENOC adds new plant-specific Note 0551 to the "Plant-Specific Notes" Table for Structures. Note 0551 states, "The 10 CFR 50 Appendix J Program manages aging of both the internal and external surfaces of the containment vessel." FENOC also adds Note "0551" to the "Notes" column for Row No. 5 of LRA Table 3.5.2-1.

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

Section B.2.12

Supplemental Question RAI OIN-377 (Accessible Cables)

FENOC generated Open Item Number OIN-377 during the NRC Region III Inspection Procedure IP-71002, "License Renewal Inspection," held during the week of August 22, 2011, to address an Inspector request regarding inspection of accessible cables in adverse localized environments. NRC Report, "Audit Report Regarding the Davis-Besse Nuclear Power Station License Renewal Application (TAC NO. ME4640)," dated June 1, 2011 (ML11122A014), page 26 (LRA AMP B.2.12 section), states:

> **"During a breakout meeting, the staff questioned and verified that the sample size of cable inspection will include all inaccessible cables within adverse localized environment."**

NRC Region III Inspection lead concurred that the word "inaccessible" in the above report statement is an error, and that the NRC intent was to establish consistency with NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," Revision 2, which specifies that all "accessible" cables within an adverse localized environment be inspected.

FENOC agreed to revise LRA Section B.2.12, "Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program," and the underlying program evaluation document, to remove reference to inspection of a "representative sample" of cables in adverse localized environments, and specify that all accessible cables in adverse localized environments are to be inspected.

SUPPLEMENTAL RESPONSE RAI OIN-377 (ACCESSIBLE CABLES)

LRA Section B.2.12 and its associated program evaluation document are revised to remove reference to inspection of a "representative sample" of cables in adverse localized environments, and specify that all accessible cables in adverse localized environments are to be inspected.

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

Section 4.7

Supplemental Question RAI OIN-378 (Crane Cycles TLAA)

FENOC generated Open Item Number OIN-378 during the NRC Region III Inspection Procedure IP-71002, "License Renewal Inspection," held during the week of August 22, 2011, to address an Inspector request regarding crane cycles. The NRC disagreed with the FENOC position that there is no time-limited aging analysis (TLAA) associated with the crane cycles for the Davis-Besse NUREG-0612 cranes. Based on discussions with the NRC, FENOC agreed to disposition the crane cycles as a TLAA.

SUPPLEMENTAL RESPONSE RAI OIN-378 (CRANE CYCLES TLAA)

The LRA is revised to include new Sections 4.7.7 and A.2.7.6, both titled "Crane Load Cycles," to address the disposition of the time-limited aging analysis associated with crane load cycles.

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

Section B.2.40

Supplemental Question RAI OIN-379 (Water Control Structures Inspection)

FENOC generated Open Item Number OIN-379 during the NRC Region III Inspection Procedure IP-71002, "License Renewal Inspection," held during the week of August 22, 2011, to address an Inspector request regarding the Water

Control Structures Inspection. NRC inspectors requested that the Davis-Besse Water Control Structures Inspection include an enhancement to the acceptance criteria element, as follows:

> **Enhance the acceptance criteria for the Water Control Structures Inspection to require that loose bolts and nuts, cracked high strength bolts, and degradation of piles and sheeting (sheet pilings) are accepted by engineering evaluation or subject to corrective actions. Engineering evaluation will be documented and based on codes, specifications and standards such as American Institute of Steel Construction (AISC) specifications, Structural Engineering Institute / American Society of Civil Engineers (SEI/ASCE) 11, and those referenced in the plant's current licensing basis.**

SUPPLEMENTAL RESPONSE RAI OIN-379 (WATER CONTROL STRUCTURES INSPECTION)

LRA Section B.2.40, "Water Control Structures Inspection," and Table A-1, "Davis-Besse License Renewal Commitments," are revised to include a program enhancement and a new license renewal future commitment bullet to Commitment 21 to include further clarification to the "Structures Monitoring Program" procedure, which includes the "Water Control Structures Inspection."

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

Section 2.4

Supplemental Question RAI OIN-381 (Yard and Switchyard Towers)

FENOC generated Open Item Number OIN-381 during the NRC Region III Inspection Procedure IP-71002, "License Renewal Inspection," held during the week of August 22, 2011, to address an Inspector request regarding Yard and Switchyard towers. NRC inspectors requested that the Davis-Besse switchyard distribution towers be specifically identified in the Structures Monitoring Program as components that are in scope for the Station Blackout (SBO) regulated event, as follows:

> **The description of SBO structural components will be expanded to include the cable support structures, by name, for the SBO electrical**

pathway in the Switchyard and from the Switchyard to the transformers in the Yard.

SUPPLEMENTAL RESPONSE RAI OIN-381 (YARD AND SWITCHYARD TOWERS)

The LRA is revised to include Switchyard Towers and Yard Towers for 345 kV electrical distribution as specific component types that are in scope for license renewal for the Station Blackout (SBO) regulated event. The component types are added to LRA Section 2.4.12, "Yard Structures," Subsection 2.4.12.9, under the description of Station Blackout Component Foundations and Structures in the Yard and Switchyard, and to Table 2.4-12 "Yard Structures Components Subject to Aging Management Review." Also, two new rows are added to Table 3.5.2-12, "Aging Management Review Results – Yard Structures."

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

Supplemental Question RAI OIN-382 (Elastomeric Vibration Isolators)

FENOC generated Open Item Number OIN-382 during the NRC Region III Inspection Procedure IP-71002, "License Renewal Inspection," held during the week of August 22, 2011, to address an Inspector request regarding elastomeric vibration isolators. A discussion with an NRC Inspector resulted in the discovery that there were elastomeric components used in the plant for vibration isolation of plant components; such elastomeric components are not currently described in the LRA. Therefore, a change to the LRA is required, described as follows:

The list of in-scope elastomeric components will be expanded to include the elastomeric elements in vibration isolators.

SUPPLEMENTAL RESPONSE RAI OIN-382 (ELASTOMERIC VIBRATION ISOLATORS)

LRA Section 2.4, "Scoping and Screening Results: Structures," and Section 3.5.2, "Results," are revised to include elastomeric vibration isolators in the list of in-scope elastomeric components, including elastomeric elements in vibration isolators. Also, as a result of the review of this item, the 'support for criterion (a)(1) equipment' (SSR) intended function is added for metal vibration isolators, including metal elements in vibration isolators.

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

Attachment 2
L-11-292

Regulatory Commitment List

The following list identifies those actions committed to by FirstEnergy Nuclear Operating Company (FENOC) for the Davis-Besse Nuclear Power Station, Unit No. 1 (Davis-Besse) in this document. Any other actions discussed in the submittal represent intended or planned actions by FENOC. They are described only as information and are not Regulatory Commitments. Please notify Mr. Clifford I. Custer, Project Manager – Fleet License Renewal, at (724) 682-7139 of any questions regarding this document or associated Regulatory Commitments.

Regulatory Commitment	Due Date
1. FENOC will perform a fatigue evaluation in accordance with the requirements of the ASME Code of record for the Davis-Besse Class 1 valves that are greater than 4 inches diameter nominal pipe size. The applicable valve identification numbers are CF28, CF29, CF30, CF31, DH76, DH77, DH11, DH12, DH1A, DH1B, DH21 and DH23. LRA Sections 4.3.2.3.2 and A.2.3.2.13, both titled "Class 1 Valves Fatigue," will be revised to include the results of the fatigue evaluations, and these changes will be submitted as an amendment to the Davis-Besse LRA no later than May 31, 2012.	May 31, 2012

Enclosure A

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

Letter L-11-292

Amendment No. 19 to the
DBNPS License Renewal Application

License Renewal Application
Sections Affected

LRA Table of Contents

Section 2
Table 2.2-3
Table 2.3.1-3
Table 2.3.3-14
Section 2.4
Section 2.4.12
Section 2.4.12.9
Table 2.4-12
Table 2.4-13

Section 3
Section 3.1.2.2.13
Table 3.1.1
Table 3.1.2-3
Section 3.3.2.1.14
Table 3.3.2-14
Table 3.3.2-26
Table 3.3.2-27
Section 3.5.2.1.13
Section 3.5.2.2.2.6
Table 3.5.1
Table 3.5.2-1
Table 3.5.2-12
Table 3.5.2-13
Table 3.5.2 P-S Notes

Section 4
Table 4.1-1
Table 4.1-2
Section 4.3.2.3.2
Section 4.3.3.2
Section 4.6.1
Section 4.7.7

Appendix A
Table of Contents
Section A.1.22
Section A.2.3.2.13
Section A.2.5.1
Section A.2.7.6
Table A-1

Appendix B
Section B.2.12
Section B.2.22
Section B.2.40

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*.

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
Table of Contents	**Page xii**	**New Row**

In response to Supplemental RAI OIN-378, the Table of Contents is revised to add new LRA Section 4.7.7, "Crane Load Cycles," as follows:

4.7.7 CRANE LOAD CYCLES 4.7-6

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
Table 2.2-3	**Pages 2.2-7, 2.2-9 and 2.2-10**	**3 New Rows**

Errata: During development of responses to NRC RAIs, FENOC identified that three types of structures were inadvertently not included in LRA Table 2.2-3, License Renewal Scoping Results for Structures." LRA Table 2.2-3 is revised to include three new rows as follows:

Table 2.2-3
License Renewal Scoping Results for Structures

Structure Name	In-Scope	Screening Results / Section
Cable Trenches	*Yes*	*2.4.12*
Duct Banks	*Yes*	*2.4.12*
Manholes	*Yes*	*2.4.12*

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
Table 2.3.1-3	**Page 2.3-16**	**New Row**

In response to Supplemental RAI Table 3.1.2-3, a new row is added to LRA Table 2.3.1-3, "Reactor Coolant System and Reactor Coolant Pressure Boundary Components Subject to Aging Management Review," to read as follows:

Component Type	Intended Function (as defined in Table 2.0-1)
Piping <4 inches - RV flange leakage line tap weld	*Pressure boundary*

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
Table 2.3.3-14	**Page 2.3-95**	**3 Rows**

In response to RAI 3.3.2.14-1, the rows associated with the fire water storage tank heat exchanger and the fire water storage tank recirculation pump in LRA Table 2.3.3-14, "Fire Protection System Components Subject to Aging Management Review," are no longer needed and are deleted as follows:

Component Type	Intended Function (as defined in Table 2.0-1)
~~*Heat Exchanger (channel, shell, and tubesheet) – Fire water storage tank heat exchanger (DB-E52)*~~	~~*Pressure boundary*~~
~~*Heat Exchanger (tubes) – Fire water storage tank heat exchanger (DB-E52)*~~	~~*Heat transfer*~~
~~*Pump Casing – Fire water storage tank recirculation pump (DB-P114)*~~	~~*Pressure boundary*~~

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
Section 2.4	**Pages 2.4-1 and 2.4-2**	**"Note," 2 new structural sub-items in Station Blackout Components and Structures**

In response to Supplemental RAI OIN-381, two new station blackout structural sub-items (i.e., Switchyard and Yard Towers) are added to the "Note" located at the end of the list of structures in the scope of license renewal at the beginning of LRA Section 2.4, "Scoping and Screening Results: Structures," as follows:

Note: The yard structures evaluated for license renewal include foundations and structural arrangements for the Borated Water Storage Tank (including Trench); Diesel Oil Pump House, Diesel Oil Storage Tank, Emergency Diesel Generator Fuel Oil Storage Tanks; Fire Hydrant Hose Houses; Fire Walls between Bus-Tie Transformers, between Bus-Tie and Startup Transformer 01, and between Auxiliary and Main Transformers; Fire Water Storage Tank; Nitrogen Storage Building; *Station Blackout Components and Structures In the Yard and Switchyard (Startup Transformers 01 and 02, Bus-Tie Transformers, 345-kV Switchyard circuit breakers ACB34560, ACB34561, ACB34562, ACB34563, ACB34564, air break switch ABS34625, Relay House, Switchyard and Yard Towers for 345-kV distribution, "J" and "K" buses);* Wave Protection Dikes; Duct Banks; Cable Trenches; and Manholes.

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
Section 2.4.12	**Page 2.4-1 and 2.4-2**	**11th Bullet, 2 new structural sub-items to "Station Blackout Component Foundations and Structures" list**

In response to Supplemental RAI OIN-381, two new station blackout structural sub-items (i.e., Switchyard and Yard Towers) are added to the eleventh bullet (Station Blackout Component Foundations and Structures) in the list of Yard Structures in LRA Section 2.4.12, "Yard Structures," as follows:

- *Station Blackout Components and Structures in the Yard and Switchyard including Startup Transformers 01 and 02; Bus-Tie Transformers; 345-kV Switchyard circuit breakers ACB34560, ACB34561, ACB34562, ACB34563 and ACB34564; 345-kV Switchyard air break switch ABS34625; Relay House, Switchyard and Yard Towers for 345-kV distribution, and the 345-kV Switchyard "J" and "K" buses*

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
Section 2.4.12.9	**Pages 2.4-42 and 2.4-43**	**"Title," and "Structure Description," 1st and 2nd Paragraphs**

In response to Supplemental RAI OIN-381, two new station blackout structural sub-items (i.e., Switchyard and Yard Towers) are added to the "Title" and to the "Structure Description," first and second paragraphs, of LRA Section 2.4.12.9, "Station Blackout Component Foundations and Structures in the Yard and Switchyard (Startup Transformers 01 and 02; Bus-Tie Transformers; 345 kV Switchyard circuit breakers ACB34560, ACB34561, ACB34562, ACB34563 and ACB34564; air break switch ABS34625; Relay House; "J" and "K" buses) – Seismic Class II," as follows:

2.4.12.9 Station Blackout Component Foundations and Structures in the Yard and Switchyard (including Startup Transformers 01 and 02; Bus-Tie Transformers; 345-kV Switchyard circuit breakers ACB34560, ACB34561, ACB34562, ACB34563 and ACB34564; air break switch ABS34625; Relay House; Switchyard and Yard Towers for 345-kV distribution ; "J" and "K" buses) – Seismic Class II

Structure Description

The station blackout component foundations and structures in the yard and switchyard (including Startup Transformers 01 and 02; Bus-Tie Transformers; 345-kV switchyard circuit breakers ACB34560, ACB34561, ACB34562, ACB34563 and ACB34564; air break switch ABS34625; Relay House; Switchyard and Yard Towers for 345-kV distribution; "J" and "K" buses) are Seismic Class II structures. Startup Transformers 01 and 02, Bus-Tie Transformers, and associated breakers (circuit breakers ACB34560, ACB34561, ACB34562, ACB34563, ACB34564 and air break switch ABS34625) define the physical boundary that provides an offsite alternating current (AC) source for recovery from a station blackout regulated event.

Startup Transformer 01, Startup Transformer 02, and the Bus-Tie Transformers have reinforced concrete foundations that rest on structural backfill. The transformers are supported on wall and column footings. *The switchyard breakers are supported by steel frame structures. ~~and t~~The bus support structures, the switchyard towers, and the yard towers are supported by reinforced concrete caisson foundations.* Cable trenches provide routing space and support to electrical cables within the station blackout boundary. The concrete cable trench is provided with removable checkered plates and top slabs for access.

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
Table 2.4-12	**Page 2.4-47**	**2 New Rows**

In response to Supplemental RAI OIN-381, two new rows are added to Table 2.4-12, "Yard Structures Components Subject to Aging Management Review," as follows:

Component Type	Intended Function (as defined in Table 2.0-1)
SBO Component Support Structures: Switchyard Towers for 345-kV Distribution	*SRE*
SBO Component Support Structures: Yard Towers for 345-kV Distribution	*SRE*

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
Table 2.4-13	**Pages 2.4-51 and 2.4-52**	**Vibration Isolators Row, and 1 New Row**

In response to Supplemental RAI OIN-382, the Vibration Isolators row of LRA Table 2.4-13, "Bulk Commodities Components Subject to Aging Management Review," is revised, and a new "Elastomeric Components" row is added to the table, as follows:

Component Type	**Intended Function (as defined in Table 2.0-1)**
Steel and Other Metals	
Vibration Isolators <u>including elements</u>	*SNS, SRE, <u>SSR</u>*
Elastomeric Components	
<u>Vibration Isolators including elements</u>	*<u>SNS, SRE, SSR</u>*

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
3.1.2.2.13	**Page 3.1-11**	**New [last] sentence**

In response to Supplemental RAI Table 3.1.2-3, a new sentence is added to the end of LRA Section 3.1.2.2.13, "Cracking due to Primary Water Stress Corrosion Cracking (PWSCC)," and the section is revised to read:

3.1.2.2.13 Cracking due to Primary Water Stress Corrosion Cracking (PWSCC)

Cracking due to PWSCC could occur in PWR components made with nickel alloy and steel with nickel alloy cladding exposed to reactor coolant. Cracking due to SCC (including PWSCC) in Davis-Besse PWR components made with nickel alloy is managed by the Inservice Inspection Program, Nickel-Alloy Management Program, and PWR Water Chemistry Program. *Cracking due to SCC (including PWSCC) for small-bore piping nickel-alloy welds is also managed by the Small Bore Class 1 Piping Inspection Program.*

Affected LRA Section **LRA Page No.** **Affected Paragraph and Sentence**

Table 3.1.1 **Page 3.1-23** **Row 3.1.1-31 "Discussion" column**

In response to Supplemental RAI Table 3.1.2-3, the text in the "Discussion" column for row 3.1.1-31 of LRA Table 3.1.1, "Summary of Aging Management Programs for Reactor Vessel, Internals, Reactor Coolant System and Reactor Coolant Pressure Boundary, and Steam Generators Evaluated in Chapter IV of NUREG-1801," is revised and now reads as follows:

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, Reactor Coolant System and Reactor Coolant Pressure Boundary, and Steam Generators Evaluated in Chapter IV of NUREG-1801

Item Number	Component/Commodity	Aging Effect/ Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.1.1-31	Nickel alloy and steel with nickel-alloy cladding piping, piping component, piping elements, penetrations, nozzles, safe ends, and welds (other than reactor vessel head); pressurizer heater sheaths, sleeves, diaphragm plate, manways and flanges; core support pads/core guide lugs	Cracking due to primary water stress corrosion cracking	Inservice Inspection (IWB, IWC, and IWD) and Water Chemistry and FSAR supp commitment to implement applicable plant commitments to (1) NRC Orders, Bulletins, and Generic Letters associated with nickel alloys and (2) staff-accepted industry guidelines.	No, but licensee commitment needs to be confirmed	Consistent with NUREG-1801. Cracking due to SCC (including PWSCC) in nickel alloy components is managed by the Inservice Inspection Program, PWR Water Chemistry Program, and Nickel-Alloy Management Program. *Cracking due to SCC (including PWSCC) for small-bore piping nickel-alloy welds is also managed by the Small Bore Class 1 Piping Inspection Program.* Further evaluation is documented in Section 3.1.2.2.13.

Affected LRA Section **LRA Page No.** **Affected Paragraph and Sentence**

Table 3.1.2-3 **Page 3.1-163** **8 New Rows**

In response to Supplemental RAI Table 3.1.2-3, LRA Table 3.1.2-3, "Aging Management Review Results – Decay Heat Removal and Low Pressure Injection System," is revised to add eight new rows as follows:

Table 3.1.2-3 Aging Management Review Results – Decay Heat Removal and Low Pressure Injection System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801, Volume 2 Item**	**Table 1 Item**	**Notes**
--	*Piping <4 inches RV flange leakage line tap weld*	*Pressure boundary*	*Nickel Alloy*	*Borated reactor coolant (Internal)*	*Cracking - Fatigue*	*TLAA*	*IV.C2-25*	*3.1.1-08*	*A*
--	*Piping <4 inches RV flange leakage line tap weld*	*Pressure boundary*	*Nickel Alloy*	*Borated reactor coolant (Internal)*	*Cracking - Flaw Growth*	*Inservice Inspection*	*IV.C2-26*	*3.1.1-62*	*C 0102 0103*
--	*Piping <4 inches RV flange leakage line tap weld*	*Pressure boundary*	*Nickel Alloy*	*Borated reactor coolant (Internal)*	*Cracking - PWSCC, SCC/IGA*	*Inservice Inspection*	*IV.C2-13*	*3.1.1-31*	*A*
--	*Piping <4 inches RV flange leakage line tap weld*	*Pressure boundary*	*Nickel Alloy*	*Borated reactor coolant (Internal)*	*Cracking - PWSCC, SCC/IGA*	*Nickel-Alloy Management*	*IV.C2-13*	*3.1.1-31*	*A 0110*

Table 3.1.2-3	Aging Management Review Results – Decay Heat Removal and Low Pressure Injection System								
Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801, Volume 2 Item	Table 1 Item	Notes
--	Piping <4 inches RV flange leakage line tap weld	Pressure boundary	Nickel Alloy	Borated reactor coolant (Internal)	Cracking - PWSCC, SCC/IGA	PWR Water Chemistry	IV.C2-13	3.1.1-31	A
--	Piping <4 inches RV flange leakage line tap weld	Pressure boundary	Nickel Alloy	Borated reactor coolant (Internal)	Cracking - PWSCC, SCC/IGA	Small Bore Class 1 Piping Inspection	IV.C2-13	3.1.1-31	E
--	Piping <4 inches RV flange leakage line tap weld	Pressure boundary	Nickel Alloy	Borated reactor coolant (Internal)	Loss of Material	PWR Water Chemistry	IV.C2-15	3.1.1-83	A
--	Piping <4 inches RV flange leakage line tap weld	Pressure boundary	Nickel Alloy	Air with borated water leakage (External)	None	None	IV.E-3	3.1.1-86	A 0103

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
3.3.2.1.14	**Page 3.3-19**	**Aging Management Programs, 1 bullet**

In response to RAI 3.3.2.14-1, the Aging Management Program subsection of Section 3.3.2.1.14, "Fire Protection System," is revised to delete the PWR Water Chemistry Program as follows:

- ~~*PWR Water Chemistry Program*~~

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
Table 3.3.2-14	**Pages 3.3-315 thru 3.3-323**	**Rows 20-30 and 77-79**

In response to RAI 3.3.2.14-1, LRA Table 3.3.2-14, "Aging Management Review Results – Fire Protection System," previously replaced in its entirety in FENOC letter dated September 16, 2011 (ML11264A059), is revised to identify that rows 20-30 and 77-79 are "Not used," as these rows are no longer needed, and the rows now read as follows:

Table 3.3.2-14 Aging Management Review Results – Fire Protection System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801, Volume 2 Item	Table 1 Item	Notes
20	~~*Heat Exchanger (channel) – Fire Water Storage Tank Heat Exchanger (DB-E52)*~~ *Not used.*	~~*Pressure boundary*~~	~~*Steel*~~	~~*Air-indoor uncontrolled (External)*~~	~~*Loss of material*~~	~~*External Surfaces Monitoring*~~	~~*VII.G-5*~~	~~*3.3.1-59*~~	~~*A*~~

Table 3.3.2-14 Aging Management Review Results – Fire Protection System									
Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801, Volume 2 Item	Table 1 Item	Notes
21	~~Heat Exchanger (channel) – Fire Water Storage Tank Heat Exchanger (DB-E52)~~ Not used.	~~Pressure boundary~~	~~Steel~~	~~Raw water (Internal)~~	~~Loss of material~~	~~Fire Water~~	~~VII.G-24~~	~~3.3.1-68~~	~~C~~
22	~~Heat Exchanger (shell) – Fire Water Storage Tank Heat Exchanger (DB-E52)~~ Not used.	~~Pressure boundary~~	~~Steel~~	~~Steam (Internal)~~	~~Loss of material~~	~~One-Time Inspection~~	~~VIII.B1-8~~	~~3.4.1-37~~	~~E 0315~~
23	~~Heat Exchanger (shell) – Fire Water Storage Tank Heat Exchanger (DB-E52)~~ Not used.	~~Pressure boundary~~	~~Steel~~	~~Steam (Internal)~~	~~Loss of material~~	~~PWR Water Chemistry~~	~~VIII.B1-8~~	~~3.4.1-37~~	~~C~~

Table 3.3.2-14 Aging Management Review Results – Fire Protection System									
Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801, Volume 2 Item	Table 1 Item	Notes
24	~~Heat Exchanger (shell) – Fire Water Storage Tank Heat Exchanger (DB-E52)~~ Not used.	~~Pressure boundary~~	~~Steel~~	~~Air-indoor uncontrolled (External)~~	~~Loss of material~~	~~External Surfaces Monitoring~~	~~VII.G-5~~	~~3.3.1-59~~	~~A~~
25	~~Heat Exchanger (tubes) – Fire Water Storage Tank Heat Exchanger (DB-E52)~~ Not used.	~~Heat transfer~~	~~Stainless Steel~~	~~Raw water (Internal)~~	~~Reduction in heat transfer~~	~~Collection, Drainage, and Treatment Components Inspection~~	~~VII.G-7~~	~~3.3.1-83~~	~~E~~
26	~~Heat Exchanger (tubes) – Fire Water Storage Tank Heat Exchanger (DB-E52)~~ Not used.	~~Heat transfer~~	~~Stainless Steel~~	~~Steam (External)~~	~~Reduction in heat transfer~~	~~PWR Water Chemistry~~	~~N/A~~	~~N/A~~	~~G~~

Table 3.3.2-14 Aging Management Review Results – Fire Protection System									
Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801, Volume 2 Item	Table 1 Item	Notes
27	~~Heat Exchanger (tubes) – Fire Water Storage Tank Heat Exchanger (DB-E52)~~ Not used.	~~Heat transfer~~	~~Stainless Steel~~	~~Steam (External)~~	~~Reduction in heat transfer~~	~~One-Time Inspection~~	~~N/A~~	~~N/A~~	~~G~~ 0315
28	~~Heat Exchanger (tubesheet) – Fire Water Storage Tank Heat Exchanger (DB-E52)~~ Not used.	~~Pressure boundary~~	~~Steel~~	~~Raw water (Internal)~~	~~Loss of material~~	~~Fire Water~~	~~VII.G-24~~	~~3.3.1-68~~	~~C~~
29	~~Heat Exchanger (tubesheet) – Fire Water Storage Tank Heat Exchanger (DB-E52)~~ Not used.	~~Pressure boundary~~	~~Steel~~	~~Steam (External)~~	~~Loss of material~~	~~One-Time Inspection~~	~~VIII.B1-8~~	~~3.4.1-37~~	~~E~~ 0315

Table 3.3.2-14 Aging Management Review Results – Fire Protection System									
Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801, Volume 2 Item	Table 1 Item	Notes
30	~~Heat Exchanger (tubesheet) – Fire Water Storage Tank Heat Exchanger (DB-E52)~~ Not used.	~~Pressure boundary~~	~~Steel~~	~~Steam (External)~~	~~Loss of material~~	~~PWR Water Chemistry~~	~~VIII.B1-8~~	~~3.4.1-37~~	~~C~~
77	~~Pump Casing – Fire Water Storage Tank Recirculation Pump (DB-P114)~~ Not used.	~~Pressure boundary~~	~~Gray Cast Iron~~	~~Raw water (Internal)~~	~~Loss of material~~	~~Fire Water~~	~~VII.G-24~~	~~3.3.1-68~~	~~A~~
78	~~Pump Casing – Fire Water Storage Tank Recirculation Pump (DB-P114)~~ Not used.	~~Pressure boundary~~	~~Gray Cast Iron~~	~~Raw water (Internal)~~	~~Loss of material~~	~~Selective Leaching Inspection~~	~~VII.G-14~~	~~3.3.1-85~~	~~A~~

Table 3.3.2-14 Aging Management Review Results – Fire Protection System									
Row No.	**Component Type**	**Intended Function(s)**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801, Volume 2 Item**	**Table 1 Item**	**Notes**
79	~~*Pump Casing – Fire Water Storage Tank Recirculation Pump (DB-P114)*~~ *Not used.*	~~*Pressure boundary*~~	~~*Gray Cast Iron*~~	~~*Air-indoor uncontrolled (External)*~~	~~*Loss of material*~~	~~*External Surfaces Monitoring*~~	~~*VII.I-8*~~	~~*3.3.1-58*~~	~~*A*~~

Affected LRA Section **LRA Page No.** **Affected Paragraph and Sentence**

Table 3.3.2-26 **Page 3.3-475** **Row 83, "Environment" column**

In response to Supplemental RAI 3.2.2.2.3.6-2, the "Environment" column of row 83 of LRA Table 3.3.2-26, "Aging Management Review Results – Service Water System," is revised as follows:

Table 3.3.2-26 Aging Management Review Results – Service Water System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801, Volume 2 Item	Table 1 Item	Notes
83	Pump Casing – Service water pump (DB-P3-1, 2, & 3)	Pressure boundary	Steel	*Moist air (External ~~(Internal)~~*	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting	N/A	N/A	G

Affected LRA Section **LRA Page No.** **Affected Paragraph and Sentence**

Table 3.3.2-27 **Page 3.3-488** **Row 38, "Environment" column**

In response to Supplemental RAI 3.2.2.2.3.6-2, the "Environment" column of row 38 of LRA Table 3.3.2-27, "Aging Management Review Results – Spent Fuel Pool Cooling and Cleanup System," is revised as follows:

Table 3.3.2-27 Aging Management Review Results – Spent Fuel Pool Cooling and Cleanup System

Row No.	Component Type	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801, Volume 2 Item	Table 1 Item	Notes
38	Piping	Structural integrity	Stainless Steel	*Moist air (External) ~~(Internal)~~*	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting	N/A	N/A	G

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
3.5.2.1.13	**Page 3.5-18**	**New "Aging Effects Requiring Management" bullet**

In response to Supplemental RAI OIN-382, a new bullet is added to the "Aging Effects Requiring Management" subsection of LRA Section 3.5.2.1.13, "Bulk Commodities," as follows:

Aging Effects Requiring Management

The following aging effects associated with structural components of evaluated bulk commodities require management:

- Change in material properties
- Cracking
- Delamination
- Loss of material
- Loss of preload
- *Reduction or loss of isolation function*
- Separation

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
3.5.2.2.2.6	**Page 3.5-31**	**2nd Paragraph, 3rd sentence, and New bullet**

In response to Supplemental RAI OIN-382, the third sentence of the second paragraph is revised, and a new bullet is added to the end of the second paragraph list of supports in LRA Section 3.5.2.2.2.6, "Aging of Supports Not Covered by Structures Monitoring Program," as follows:

Each of the following is within the scope of the Structures Monitoring Program. Therefore, further evaluation is not required. *In addition, loss of material due to corrosion for susceptible materials is managed by the Boric Acid Corrosion Program within areas that contain borated systems.*

- Building concrete around support anchorages
- HVAC duct supports
- Instrument supports
- Non-ASME mechanical equipment supports
- Non-ASME supports
- Electrical panels and enclosures
- *Vibration isolators including elements*

Affected LRA Section **LRA Page No.** **Affected Paragraph and Sentence**

Table 3.5.1 **Page 3.5-53** **Row 3.5.1-41, "Discussion" column**

In response to Supplemental RAI OIN-382, the "Discussion" column of row 3.5.1-41 of LRA Table 3.5.1, "Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of NUREG-1801," is revised as follows:

Table 3.5.1 Summary of Aging Management Programs for Structures and Component Supports Evaluated in Chapters II and III of NUREG-1801

Item Number	Component/Commodity	Aging Effect/ Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.5.1-41	Vibration isolation elements	Reduction or loss of isolation function/radiation hardening, temperature, humidity, sustained vibratory loading	Structures Monitoring Program	Yes, if not within the scope of the applicant's structures monitoring program	~~*Not applicable.*~~ ~~*Davis-Besse has not identified non-metallic vibration isolator elements.*~~ *Consistent with NUREG-1801.* *The Structures Monitoring Program is credited for aging management of these effects and mechanisms.* *Further evaluation is documented in Section 3.5.2.2.2.6.*

Affected LRA Section **LRA Page No.** **Affected Paragraph and Sentence**

Table 3.5.2-1 **Page 3.5-63** **Row 5, "Notes" column**

In response to Supplemental RAI OIN-363, the "Notes" column of row 5 of LRA Table 3.5.2-1, "Aging Management Review Results – Containment," is revised to add new plant-specific note 0551, as follows:

Table 3.5.2-1 Aging Management Review Results – Containment

Row No.	Component / Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801, Volume 2 Item	Table 1 Item	Notes
5	Containment Vessel	EN, FLB, HELB, SHD, SPB, SRE, SSR	Carbon Steel	Air-indoor	Loss of material	ISI Program-IWE 10 CFR Part 50, Appendix J	II.A2-9	3.5.1-06	*A* *0551*

Affected LRA Section **LRA Page No.** **Affected Paragraph and Sentence**

Table 3.5.2-12 **Page 3.5-113** **2 New Rows**

In response to Supplemental RAI OIN-381, two new rows are added to LRA Table 3.5.2-12, "Aging Management Review Results – Yard Structures," as follows:

Table 3.5.2-12 Aging Management Review Results – Yard Structures

Row No.	Component / Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801, Volume 2 Item	Table 1 Item	Notes
--	*SBO Component Support Structure: Switchyard Towers for 345-kV Distribution*	*SRE*	*Carbon Steel*	*Air-outdoor*	*Loss of material*	*Structures Monitoring*	*III.A3-12*	*3.5.1-25*	*A*
--	*SBO Component Support Structure: Yard Towers for 345-kV Distribution*	*SRE*	*Carbon Steel*	*Air-outdoor*	*Loss of material*	*Structures Monitoring*	*III.A3-12*	*3.5.1-25*	*A*

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
Table 3.5.2-13	**Page 3.5-113**	**Row 135, "Component Type" and "Intended Function" columns; and, New Row**

In response to Supplemental RAI OIN-382, the "Component / Commodity" and "Intended Function" columns of row 135 are revised, and a new row is added to LRA Table 3.5.2-13, "Aging Management Review Results – Bulk Commodities," as follows:

Table 3.5.2-13 Aging Management Review Results – Bulk Commodities

Row No.	Component / Commodity	Intended Function[1]	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801, Volume 2 Item	Table 1 Item	Notes
135	*Vibration Isolators including elements*	*SNS, SRE, SSR*	Carbon Steel	Air-indoor	Loss of material	Structures Monitoring	III.B2-10	3.5.1-39	A
--	*Vibration Isolators including elements*	*SNS, SRE, SSR*	*Elastomer*	*Air-indoor*	*Reduction or loss of isolation function*	*Structures Monitoring*	*III.B4-12*	*3.5.1-41*	*A*

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
Table 3.5.2 Plant-Specific Notes	**Page 3.5-172**	**New Note / Row**

In response to Supplemental RAI OIN-363, LRA Table 3.5.2, "Plant-Specific Notes," is revised to add a new plant-specific note as follows:

Plant-Specific Notes:	
0551	*The 10 CFR 50 Appendix J Program manages aging of both the internal and external surfaces of the containment vessel.*

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
Table 4.1-1	**Page 4.1-4**	**New row**

In response to Supplemental RAI OIN-378, new LRA Section 4.7.7, "Crane Load Cycles," is added to LRA Table 4.1-1, "Time-Limited Aging Analyses," as follows:

Table 4.1-1 Time-Limited Aging Analyses

Results of TLAA Evaluation by Category	54.21(c)(1) Paragraph	LRA Section
Other Plant-Specific Time-Limited Aging Analyses		4.7
Crane Load Cycles	*(i)*	*4.7.7*

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
Table 4.1-2	**Page 4.1-5**	**Fatigue analysis of the polar crane row**

In response to Supplemental RAI OIN-378, the "Fatigue analysis of the polar crane" row of LRA Table 4.1-2, "Review of Generic TLAAs Listed in NUREG-1800," is revised as follows:

Table 4.1-2 Review of Generic TLAAs Listed in NUREG-1800

NUREG-1800 Generic TLAAs	Applicable to Davis-Besse (Y/N?)	LRA Section
NUREG-1800, Table 4.1-3		
Fatigue analysis of the polar crane	~~*No – No TLAA identified*~~ *Yes*	*4.7.7*

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
4.3.2.3.2	**Pages 4.3-16 and 4.3-17**	**2nd Paragraph, 2nd Sentence**

In response to RAI 4.3.2.3.2-1 - (Supplement), LRA Section 4.3.2.3.2, "Class 1 Valves Fatigue," previously replaced in its entirety in FENOC letter dated July 22, 2011 (ML11208C274), second paragraph, is revised to read as follows:

A search of the Davis-Besse records did not locate fatigue evaluations for the subject Class 1 valves. ~~*Therefore, a commitment is provided in Appendix A to perform a fatigue evaluation in accordance with the requirements of the ASME Code of record for the Davis-Besse Class 1 valves greater than 4 inches diameter nominal pipe size.*~~ The issue of missing records has been documented in the Davis-Besse Corrective Action Program for resolution.

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
4.3.3.2	**Page 4.3-23**	**1st Bulleted Item – both paragraphs**

In response to RAI 3.3.2.14-1, the first bulleted item on LRA page 4.3-23 in LRA Section 4.3.3.2, "Non-Class 1 Major Components," is deleted in its entirety as follows:

- ~~*The fire water storage tank heat exchanger is the only non-piping component within the evaluation boundaries of the Fire Protection System that exceeds the fatigue threshold temperature. This heat exchanger was fabricated in accordance with ASME Section VIII Division 1.*~~

  ~~*No fatigue analysis exists for the fire water storage tank heat exchanger, and therefore, there is no TLAA related to fatigue. This component requires no further fatigue evaluation for the period of extended operation.*~~

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
4.6.1	Page 4.6-1	Second paragraph

In response to Supplemental RAI 4.6-1, LRA Section 4.6.1, "Containment Vessel," second paragraph, is revised to read as follows:

4.6.1 CONTAINMENT VESSEL

The containment vessel is a cylindrical steel pressure vessel with hemispherical dome and ellipsoidal bottom which houses the reactor vessel, reactor coolant piping, pressurizer, pressurizer quench tank and coolers, reactor coolant pumps, steam generators, core flooding tanks, letdown coolers, and normal ventilating system. The containment vessel is a Class B vessel as defined in the ASME Section III, Paragraph N-132, 1968 Edition through Summer 1969 Addenda.

The containment vessel is designed to resist dead loads, LOCA loads, operating loads, external pressure load, temperature and pressure, impingement force and missiles, wind loads, seismic loads, gravity loads, and live loads. The containment vessel meets the requirements of ASME Section III, Paragraph N-415.1; thereby justifying the exclusion of cyclic or fatigue analyses in the design of the containment vessel. Analysis of 400 pressure cycles (from -0.67 psig to 45 psig) and 400 temperature cycles (from 30°F to 120°F) were performed against the requirements of ASME Section III, Paragraph N-415.1. *The 400 cycles were based on a conservative estimate of anticipated cycles for 40 years of operation. Details of the ASME Section III, Paragraph N-415 analysis are as follows.*

N-415.1(a)

The number of times (including startup and shutdown) that the pressure will be cycled from atmospheric pressure to operating pressure and back to atmospheric pressure must not exceed the number of cycles on Figure N-415(A) corresponding to an S_a value of 3 times S_m.

3 S_m is equal to 56,250 psi and from Figure N-415(A) the corresponding number of cycles is equal to 1,800. The specified number of 400 pressure cycles is less than the 1,800 cycles from Figure N-415(A). Therefore, the condition in N-415.1(a) is met.

N-415.1(b)

Specified full range of pressure fluctuations may not exceed the quantity 1/3 x design pressure x S_a/S_m. S_a is the value from Figure N-415(A) for 400 cycles.

1/3 x 36 x 125,000/18,750 = 80 psi

Specified full range of pressure fluctuations is 45 psi (-25 to 20 psi) and is less than 80 psi. Therefore, the condition in N-415.1(b) is met.[1]

N-415.1(c)

The temperature difference in degrees F between any two adjacent points during normal operation and during startup and shutdown must not exceed $S_a/(2E\alpha)$.

For a mean temperature of 70°F, 120,000 / 2(27.9 x 10^6)(6.07 x 10^{-6}) = 358°F.

Temperature cycle range of 90°F (from 30°F to 120°F) is less than 358°F. Therefore, the condition in N-415.1(c) is met.

N-415.1(d)

The temperature difference in degrees F between any two adjacent points does not change during normal operation by more than $S_a/(2E\alpha)$.

For a mean temperature of 70°F, 120,000 / 2(27.9 x 10^6)(6.07 x 10^{-6}) = 358°F

Temperature cycle range of 90°F (from 30°F to 120°F) is less than 358°F. Therefore, the condition in N-415.1(d) is met.

[1] *The pressure cycle range used in the fatigue waiver evaluation is from -25 to 20 psi for a full range pressure fluctuation of 45 psi. However, the possible full range pressure fluctuation is from -0.67 to 45 psig based on the containment vessel design allowable negative pressure of -0.67 psig and the containment vessel pneumatic test pressure of 45 psig (design pressure of 36 psig times 1.25). This adjusted full range pressure fluctuation of 45.67 psi is less than the 80 psi value determined in N-415.1(b) above. Therefore, the condition in N-415.1(b) is met.*

The 60-year projected cycles for plant heatup and cooldown are 128 (shown in Table 4.3-1) and are less than the specified 400 pressure cycles and 400 temperature cycles. Therefore, the values of 400 pressure and temperature cycles used to exclude fatigue analyses will not be exceeded for 60 years of

operation. Thus, the TLAAs associated with exclusion of fatigue analyses for the containment vessel will remain valid for the period of extended operation.

Disposition: 10 CFR 54.21(c)(1)(i) The TLAAs excluding the containment vessel from fatigue analysis per ASME Section III, Paragraph N415-1 will remain valid through the period of extended operation.

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
4.7.7	Page 4.7-6	New Section

In response to Supplemental RAI OIN-378, new LRA Section 4.7.7, "Crane Load Cycles," is added as follows:

4.7.7 CRANE LOAD CYCLES

The load cycle limits for cranes was identified as a potential TLAA. The following Davis-Besse cranes are in the scope of License Renewal and have been identified as having a TLAA, which requires evaluation for 60 years:

- *containment polar crane (including auxiliary hoist)*
- *reactor service crane*
- *spent fuel shipping cask crane (including auxiliary hoist)*
- *intake structure gantry crane*

These cranes are designed in accordance with Bechtel design specifications. These specifications require that the cranes shall be designed in accordance with the minimum requirements for Class A cranes as stated in Crane Manufacturers Association of America (CMAA) Specification 70 for Electric Overhead Traveling Cranes, except as the requirements are extended by the Bechtel specification; and, in the case of conflict, that the more stringent requirements shall govern. Class A cranes are designed for up to 100,000 load cycles.

Containment Polar Crane (including Auxiliary Hoist)

The estimated number of cycles for 60 years of operation is bounded by 22,000 cycles. Less than 500 cycles are due to the main hoist with the remaining cycles due to the auxiliary hoist. The rate of occurrence is based on refueling outages, mid cycle outages with core off load and the final core off load at the end of 60 years of operation. In addition, 500 cycles are estimated for the pre-operational construction period and are included in the estimate of 22,000 cycles. Since the total number of cycles is at the low end of the allowable design value of up to 100,000 cycles, the containment polar crane (including auxiliary hoist) load cycle assumption remains valid for the period of extended operation.

Reactor Service Crane

The estimated number of cycles for 60 years of operation is bounded by 8,000 cycles. The rate of occurrence is based on refueling outages, mid cycle outages

with core off load and the final core off load at the end of 60 years of operation. In addition, 500 cycles are estimated for the pre-operational construction period and are included in the estimate of 8,000 cycles. Since the total number of cycles is at the low end of the allowable design value of up to 100,000 cycles, the reactor service crane load cycle assumption remains valid for the period of extended operation.

Spent Fuel Shipping Cask Crane (including Auxiliary Hoist)

The estimated number of cycles for 60 years of operation is bounded by 18,000 cycles. The rate of occurrence is based on refueling outages, mid cycle outages with core off load and the final core off load at the end of 60 years of operation. In addition, 500 cycles are estimated for the pre-operational construction period and are included in the estimate of 18,000 cycles. Also, 3,600 cycles are estimated for crane usage during non-outage periods and are included in the estimate of 18,000 cycles. Since the total number of cycles is at the low end of the allowable design value of up to 100,000 cycles, the spent fuel shipping cask crane (including auxiliary hoist) load cycle assumption remains valid for the period of extended operation.

Intake Structure Gantry Crane

The estimated number of cycles for 60 years of operation is bounded by 1,700 cycles. The rate of occurrence is based on crane usage through out the calendar year at 20 cycles per year. In addition, 500 cycles are estimated for the pre-operational construction period and are included in the estimate of 1,700 cycles. Since the total number of cycles is at the low end of the allowable design value of up to 100,000 cycles, the intake structure gantry crane load cycle assumption remains valid for the period of extended operation.

Disposition: *10 CFR 54.21(c)(1)(i) Crane load assumptions remain valid for the period of extended operation.*

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
Appendix A Table of Contents	**Page A-5**	**New Row**

In response to Supplemental RAI OIN-378, the Appendix A Table of Contents is revised to add new LRA Section A.2.7.6, "Crane Load Cycles," as follows:

A.2.7.6 CRANE LOAD CYCLES A-50

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
A.1.22	**Page A-17**	**First paragraph**

In response to Supplemental RAI B.2.22-7, the first paragraph of LRA Section A.1.22, "Inservice Inspection (ISI) Program - IWE," previously revised in FENOC letter dated August 17, 2011 (ML11231A966), is split into two paragraphs and revised to read as follows:

A.1.22 INSERVICE INSPECTION (ISI) PROGRAM – IWE

The Inservice Inspection (ISI) Program – IWE establishes responsibilities and requirements for conducting ASME Code, Section XI, Subsection IWE (IWE) inspections as required by 10 CFR 50.55a. The Inservice Inspection (ISI) Program – IWE includes examination and testing of accessible surface areas of the steel containment; containment hatches and airlocks; seals, gaskets and moisture barriers; and containment pressure-retaining bolting in accordance with the requirements of IWE.

The program ~~will~~ includes surface examinations to monitor for cracking of containment stainless steel penetration sleeves, dissimilar metal welds, bellows, and steel components that are subject to cyclic loading but have no current licensing basis fatigue analysis. The inspection sample size includes 10 percent

of the containment penetration population that are subject to cyclic loading but have no current licensing basis fatigue analysis. Penetrations included in the inspection sample will be scheduled for examination in each 10-year ISI interval that occurs during the period of extended operation. Should fatigue analyses be performed in the future for the subject containment penetrations, the surface examinations will no longer be required. In addition, the 10 CFR Part 50 Appendix J Program provides for verification that a general visual inspection of the accessible interior and exterior surfaces of the primary containment and components (includes penetrations) has been performed prior to the integrated leak rate test (ILRT) pressurization to identify evidence of structural deterioration that might affect either the primary containment structural integrity or leak tightness.

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
A.2.3.2.13	**Page A-41**	**2nd Paragraph, 2nd Sentence**

In response to RAI 4.3.2.3.2-1 - (Supplement), LRA Section A.2.3.2.13, "Class 1 Valves Fatigue," previously added in FENOC letter dated July 22, 2011 (ML11208C274), second paragraph, is revised to read as follows:

A search of the Davis-Besse records did not locate fatigue evaluations for the subject Class 1 valves. ~~*Therefore, a commitment is provided in Table A-1 of this Appendix to perform a fatigue evaluation in accordance with the requirements of the ASME Code of record for the Davis-Besse Class 1 valves greater than 4 inches diameter nominal pipe size.*~~ *The issue of missing records has been documented in the Davis-Besse Corrective Action Program for resolution.*

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
A.2.5.1	**Pages A-44 & A-45**	**Entire section**

In response to Supplemental RAI 4.6-1, LRA Section A.2.5.1, "Containment Vessel," is revised to read as follows:

A.2.5.1 Containment Vessel

The containment vessel is a Class B vessel as defined in the ASME Section III, Paragraph N-132, 1968 Edition through Summer Addenda 1969. The containment vessel meets the requirements for Paragraph N-415.1 of ASME Section III, thereby justifying the exclusion of cyclic or fatigue analyses in the design of the containment vessel. *Analysis of 400 pressure cycles (from -0.67 psig to 45 psig) and 400 temperature cycles (from 30°F to 120°F) were performed against the requirements of ASME Section III, Paragraph N-415.1. The 400 cycles were based on a conservative estimate of anticipated cycles for 40 years of operation. Details of the ASME Section III, Paragraph N-415 analysis are as follows.*

N-415.1(a)

The number of times (including startup and shutdown) that the pressure will be cycled from atmospheric pressure to operating pressure and back to atmospheric pressure must not exceed the number of cycles on Figure N-415(A) corresponding to an S_a value of 3 times S_m.

3 S_m is equal to 56,250 psi and from Figure N-415(A) the corresponding number of cycles is equal to 1,800. The specified number of 400 pressure cycles is less than the 1,800 cycles from Figure N-415(A). Therefore, the condition in N-415.1(a) is met.

N-415.1(b)

Specified full range of pressure fluctuations may not exceed the quantity 1/3 x design pressure x S_a/S_m. S_a is the value from Figure N-415(A) for 400 cycles.

1/3 x 36 x 125,000/18,750 = 80 psi

Specified full range of pressure fluctuations is 45 psi (-25 to 20 psi) and is less than 80 psi. Therefore, the condition in N-415.1(b) is met.[1]

N-415.1(c)

The temperature difference in degrees F between any two adjacent points during normal operation and during startup and shutdown must not exceed $S_a/(2E\alpha)$.

For a mean temperature of 70°F, 120,000 / 2(27.9 x 10^6)(6.07 x 10^{-6}) = 358°F.

Temperature cycle range of 90°F (from 30°F to 120°F) is less than 358°F. Therefore, the condition in N-415.1(c) is met.

N-415.1(d)

The temperature difference in degrees F between any two adjacent points does not change during normal operation by more than $S_a/(2E\alpha)$.

For a mean temperature of 70°F, 120,000 / 2(27.9 x 10^6)(6.07 x 10^{-6}) = 358°F

Temperature cycle range of 90°F (from 30°F to 120°F) is less than 358°F. Therefore, the condition in N-415.1(d) is met.

[1] *The pressure cycle range used in the fatigue waiver evaluation is from -25 to 20 psi for a full range pressure fluctuation of 45 psi. However, the possible full range pressure fluctuation is from -0.67 to 45 psig based on the containment vessel design allowable negative pressure of -0.67 psig and the containment vessel pneumatic test pressure of 45 psig (design pressure of 36 psig times 1.25). This adjusted full range pressure fluctuation of 45.67 psi is less than the 80 psi value determined in N-415.1(b) above. Therefore, the condition in N-415.1(b) is met.*

The 60-year projected cycles for plant heatup and cooldown are 128 ~~(shown in Table 4.3-1)~~ and are less than the specified 400 pressure cycles and 400 temperature cycles. Therefore, the values of 400 pressure cycles and 400 temperature cycles used to exclude fatigue analyses will not be exceeded for 60 years of operation.

The TLAA associated with exclusion of the containment vessel from fatigue analyses per ASME Section III, Paragraph N-415.1 remains valid for the period of extended operation in accordance with 10 CFR 54.21(c)(1)(i).

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
A.2.7.6	**Page A-50**	**New Section**

In response to Supplemental RAI OIN-378, new LRA Section A.2.7.6, "Crane Load Cycles," is added as follows:

A.2.7.6 Crane Load Cycles

The load cycle limits for cranes was identified as a potential TLAA. The following Davis-Besse cranes are in the scope of License Renewal and have been identified as having a TLAA, which requires evaluation for 60 years:

- *containment polar crane (including auxiliary hoist)*
- *reactor service crane*
- *spent fuel shipping cask crane (including auxiliary hoist)*
- *intake structure gantry crane*

These cranes are designed in accordance with Bechtel design specifications. These specifications require that the cranes shall be designed in accordance with the minimum requirements for Class A cranes as stated in Crane Manufacturers Association of America (CMAA) Specification 70 for Electric Overhead Traveling Cranes, except as the requirements are extended by the Bechtel specification; and, in the case of conflict, that the more stringent requirements shall govern. Class A cranes are designed for up to 100,000 load cycles.

Containment Polar Crane (including Auxiliary Hoist)

The estimated number of cycles for 60 years of operation is bounded by 22,000 cycles. Less than 500 cycles are due to the main hoist with the remaining cycles due to the auxiliary hoist. The rate of occurrence is based on refueling outages, mid cycle outages with core off load and the final core off load at the end of 60 years of operation. In addition, 500 cycles are estimated for the pre-operational construction period and are included in the estimate of 22,000 cycles. Since the total number of cycles is at the low end of the allowable design value of up to 100,000 cycles, the containment polar crane (including auxiliary hoist) load cycle assumption remains valid for the period of extended operation.

Reactor Service Crane

The estimated number of cycles for 60 years of operation is bounded by 8,000 cycles. The rate of occurrence is based on refueling outages, mid cycle outages with core off load and the final core off load at the end of 60 years of operation. In

addition, 500 cycles are estimated for the pre-operational construction period and are included in the estimate of 8,000 cycles. Since the total number of cycles is at the low end of the allowable design value of up to 100,000 cycles, the reactor service crane load cycle assumption remains valid for the period of extended operation.

Spent Fuel Shipping Cask Crane (including Auxiliary Hoist)

The estimated number of cycles for 60 years of operation is bounded by 18,000 cycles. The rate of occurrence is based on refueling outages, mid cycle outages with core off load and the final core off load at the end of 60 years of operation. In addition, 500 cycles are estimated for the pre-operational construction period and are included in the estimate of 18,000 cycles. Also, 3,600 cycles are estimated for crane usage during non-outage periods and are included in the estimate of 18,000 cycles. Since the total number of cycles is at the low end of the allowable design value of up to 100,000 cycles, the spent fuel shipping cask crane (including auxiliary hoist) load cycle assumption remains valid for the period of extended operation.

Intake Structure Gantry Crane

The estimated number of cycles for 60 years of operation is bounded by 1,700 cycles. The rate of occurrence is based on crane usage through out the calendar year at 20 cycles per year. In addition, 500 cycles are estimated for the pre-operational construction period and are included in the estimate of 1,700 cycles. Since the total number of cycles is at the low end of the allowable design value of up to 100,000 cycles, the intake structure gantry crane load cycle assumption remains valid for the period of extended operation.

Therefore, the crane load cycle assumptions remain valid for the period of extended operation in accordance with 10 CFR 54.21(c)(1)(i).

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
Table A-1	**Pages A-65 and A-69**	**Commitment No. 20, sixth bullet, and New Commitment 26**

In response to Supplemental RAI B.2.39-11, a portion of the sixth bulleted item in license renewal future Commitment 20 in LRA Table A-1, "Davis-Besse License Renewal Commitments," is transferred to new license renewal future Commitment 26, which was previously revised to "Not used" in FENOC letter dated September 16, 2011 (ML11264A059), and the Implementation Schedule is revised from April 22, 2017, to December 31, 2014, as follows:

Table A-1
Davis-Besse License Renewal Commitments

Item Number	Commitment	Implementation Schedule	Source	Related LRA Section No./ Comments
20	~~• *Obtain and evaluate for degradation a concrete core bore from two representative inaccessible concrete components of an in-scope structure subjected to aggressive groundwater prior to entering the period of extended operation. Based on the results of the initial core bore sample, evaluate the need for collection and evaluation of representative concrete core bore samples at additional locations that may be identified during the period of extended operation as having aggressive groundwater infiltration. Select additional core bore sample locations based on the duration of observed aggressive groundwater infiltration.*~~ *Perform an inspection for loss of material for carbon steel structural components subject to aggressive groundwater. Require the use of the FENOC Corrective Action Program for identified concrete or steel degradation.*	Prior to April 22, 2017	LRA and FENOC Letters L-11-153 and L-11-237	A.1.39 B.2.39 *Responses to NRC RAIs* ~~*B.2.39-3,*~~ *B.2.39-4, B.2.39-5, B.2.39-6 and B.2.39-7 from NRC Letter dated April 5, 2011,*

Table A-1
Davis-Besse License Renewal Commitments

Item Number	Commitment	Implementation Schedule	Source	Related LRA Section No./ Comments
				and RAIs B.2.39-11 and 3.5.2.3.12-4 from NRC Letter dated July 21, 2011

Table A-1

Davis-Besse License Renewal Commitments

Item Number	Commitment	Implementation Schedule	Source	Related LRA Section No./ Comments
26	*Obtain and evaluate for degradation a concrete core bore from two representative inaccessible concrete components of an in-scope structure subjected to aggressive groundwater prior to entering the period of extended operation. Based on the results of the initial core bore sample, evaluate the need for collection and evaluation of representative concrete core bore samples at additional locations that may be identified during the period of extended operation as having aggressive groundwater infiltration. Select additional core bore sample locations based on the duration of observed aggressive groundwater infiltration. Document identified concrete or steel degradation in the FENOC Corrective Action Program.* ~~*Not used.*~~	*Prior to December 31, 2014*	*FENOC Letters L-11-153, L-11-237, and L-11-257*	*Responses to NRC RAI B.2.39-3 from NRC Letter dated April 5, 2011, RAI B.2.39-11 from NRC Letter dated July 21, 2011, and Supplemental RAI B.2.39-11 from telecon held with the NRC on September 13, 2011*

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
Table A-1	**Page A-68**	**Commitment No. 21, new bullet**

A new 7th bulleted commitment is added to existing Commitment 21, Water Control Structures Inspection Enhancements, in response to Supplemental RAI OIN-379. LRA Table A-1, "Davis-Besse License Renewal Commitments," Commitment 21, is revised to include the new commitment bullet, as follows:

Table A-1

Davis-Besse License Renewal Commitments

Item Number	Commitment	Implementation Schedule	Source	Related LRA Section No./ Comments
21	• *Require that loose bolts and nuts, cracked high strength bolts, and degradation of piles and sheeting (sheet pilings) are accepted by engineering evaluation or subject to corrective actions. Engineering evaluation will be documented and based on codes, specifications and standards such as American Institute of Steel Construction (AISC) specifications, Structural Engineering Institute / American Society of Civil Engineers (SEI/ASCE) 11, and codes, specifications or standards referenced in the Davis-Besse current licensing basis.*	Prior to April 22, 2017	LRA *FENOC Letters L-11-153 and L-11-292*	A.1.40 B.2.40 *Responses to NRC RAI B.2.39-6 from NRC Letter dated April 5, 2011, and Supplemental RAI OIN-379 from Region III 71002 Inspection*

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
Table A-1	**Page A-69**	**Commitment No. 46**

In response to RAI 4.3.2.3.2-1 - (Supplement), license renewal future Commitment No. 46 previously added in FENOC letter dated July 22, 2011 (ML11208C274), is no longer needed and is revised to read "Not used," as follows:

Table A-1

Davis-Besse License Renewal Commitments

Item Number	Commitment	Implementation Schedule	Source	Related LRA Section No./ Comments
46	~~*FENOC commits to perform a fatigue evaluation in accordance with the requirements of the ASME Code of record for the Davis-Besse Class 1 valves that are greater than 4 inches diameter nominal pipe size. The applicable valve identification numbers are CF28, CF29, CF30, CF31, DH76, DH77, DH11, DH12, DH1A, DH1B, DH21 and DH23.*~~ *Not used.*	~~*Prior to April 22, 2015*~~	~~*LRA*~~ ~~*FENOC Letter L-11-218*~~	~~*4.3.2.3.2*~~ ~~*A.2.3.2.13*~~ ~~*Response to NRC RAI 4.1-1 from NRC Letter dated May 2, 2011*~~

Affected LRA Section **LRA Page No.** **Affected Paragraph and Sentence**

Table A-1 **Page A-69** **Commitment 47**

License renewal future Commitment 47 is revised based on the response to Supplemental RAI B.2.22-7 regarding examination of Containment penetrations, and LRA Table A-1, "Davis-Besse License Renewal Commitments," is revised to read as follows:

Table A-1
Davis-Besse License Renewal Commitments

Item Number	Commitment	Implementation Schedule	Source	Related LRA Section No./ Comments
47	Enhance the Inservice Inspection (ISI) Program - IWE to: • *Include surface examinations to monitor for cracking of stainless steel Containment penetration sleeves, dissimilar metal welds, bellows, and steel components that are subject to cyclic loading but have no current licensing basis fatigue analysis. The inspection sample size will include 10 percent of the containment penetration population that are subject to cyclic loading but have no current licensing basis fatigue analysis. Penetrations included in the inspection sample will be scheduled for examination in each 10-year ISI interval that occurs during the period of extended operation. Should fatigue analyses be performed in the future for the subject containment penetrations, the surface examinations will no longer be required.*	Prior to April 22, 2017	LRA and *FENOC Letters L-11-238 and L-11-292*	A.1.22 B.2.22 *Responses to NRC RAI B.2.22-7 from NRC Letter dated July 21, 2011, and Supplemental RAI B.2.22-7 from NRC*

Table A-1

Davis-Besse License Renewal Commitments

Item Number	Commitment	Implementation Schedule	Source	Related LRA Section No./ Comments
				Telecons on September 13 and 16, 2011

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
B.2.12	**Page B-61**	**Detection of Aging Affects, 1st Sentence**

In response to Supplemental RAI OIN-377, LRA Section B.2.12, "Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program," Detection of Aging Effects paragraph, first sentence, is revised to read as follows:

- Detection of Aging Effects
  As described above in Parameters Monitored or Inspected, the Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program provides for a visual inspection ~~of a representative sample~~ of all accessible electrical cables and connections located in adverse localized environments. The visual inspections will be performed on a 10-year interval, with the first inspection taking place within the 10-year period prior to the end of the current operating license. The program will inspect the accessible cables and connections for aging effects due to adverse localized environments caused by heat, radiation, or moisture, in the presence of oxygen. The visible effects of aging are embrittlement, discoloration, cracking, and surface contamination. The visible evidence of aging (on the cable jackets and the connection insulating bases) is considered representative of aging to the cable insulation and the connection insulation.

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
B.2.22	**Page B-96**	**Program Description subsection, first paragraph; and, Enhancements subsection**

In response to Supplemental RAI B.2.22-7, LRA Section B.2.22, "Inservice Inspection (ISI) Program - IWE," "Program Description," previously revised in FENOC letter dated August 17, 2011 (ML11231A966), is revised to split the first paragraph of the "Program Description" into two paragraphs, and to add more detail to the Parameters Monitored and Inspected "Enhancement," as follows:

B.2.22 INSERVICE INSPECTION (ISI) PROGRAM – IWE

Program Description

The Inservice Inspection (ISI) Program – IWE establishes responsibilities and requirements for conducting ASME Code Section XI, Subsection IWE inspections as required by 10 CFR 50.55a. The Inservice Inspection (ISI) Program – IWE includes examination and/or testing of accessible surface areas of the steel containment vessel; containment hatches and airlocks; seals, gaskets and moisture barriers; and containment pressure-retaining bolting. These examinations are in accordance with the requirements of the ASME Code, Section XI, 1995 Edition through the 1996 Addenda.

The program will include surface examinations to monitor for cracking of ~~C~~containment stainless steel penetration sleeves, dissimilar metal welds, bellows, and steel components that are subject to cyclic loading but have no current licensing basis fatigue analysis. The inspection sample size will include 10 percent of the containment penetration population that are subject to cyclic loading but have no current licensing basis fatigue analysis. Penetrations included in the inspection sample will be scheduled for examination in each 10-year ISI interval that occurs during the period of extended operation. Should fatigue analyses be performed in the future for the subject containment penetrations, the surface examinations will no longer be required. In addition, the 10 CFR Part 50 Appendix J Program provides for verification that a general visual inspection of the accessible interior and exterior surfaces of the primary containment and components (includes penetrations) has been performed prior to the integrated leak rate test (ILRT) pressurization to identify evidence of structural deterioration that might affect either the primary containment structural integrity or leak tightness.

Enhancements

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

- **Parameters Monitored or Inspected**

  The Inservice Inspection (ISI) Program – IWE will include surface examinations to monitor for cracking of ~~C~~containment stainless steel penetration sleeves, dissimilar metal welds, bellows, and steel components that are subject to cyclic loading but have no current licensing basis fatigue analysis. The inspection sample size will include 10 percent of the containment penetration population that are subject to cyclic loading but have no current licensing basis fatigue analysis. Penetrations included in the inspection sample will be scheduled for examination in each 10-year ISI interval that occurs during the period of extended operation. Should fatigue analyses be performed in the future for the subject containment penetrations, the surface examinations will no longer be required.

Affected LRA Section	LRA Page No.	Affected Paragraph and Sentence
B.2.40	**Page B-163**	**Enhancements – Acceptance Criteria, new [last] paragraph**

In response to Supplemental RAI OIN-379, LRA Section B.2.40, "Water Control Structures Inspection," "Enhancements" – "Acceptance Criteria" subsection, is revised to include a new paragraph at the end of the section, as follows:

The Structures Monitoring Program procedure, which implements the Water Control Structures Inspection, will be enhanced to require that loose bolts and nuts, cracked high strength bolts, and degradation of piles and sheeting (sheet pilings) are accepted by engineering evaluation or subject to corrective actions. Engineering evaluation will be documented and based on codes, specifications and standards such as American Institute of Steel Construction (AISC) specifications, Structural Engineering Institute / American Society of Civil Engineers (SEI/ASCE) 11, and codes, specifications or standards referenced in the Davis-Besse current licensing basis.

Enclosure B

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

Letter L-11-292

Revised DBNPS License Renewal Application Boundary Drawing

1 page
(not including this cover page)

The following License Renewal Application Boundary Drawing is revised and is enclosed:

LR Drawing LR-M0016A Revision 2

THIS PAGE IS AN OVERSIZED DRAWING OR FIGURE,

THAT CAN BE VIEWED AT THE RECORD TITLED:

"PIPING & INSTRUMENT DIAGRAM STATION FIRE PROTECTION SYSTEM, DRAWING NO. M-016A, REV. 48"

WITHIN THIS PACKAGE

D-01