Davis-BesseNPEm Resource

From: CuadradoDeJesus, Samuel
Sent: Thursday, June 23, 2011 8:34 AM
To: 'custerc@firstenergycorp.com'; dorts@firstenergycorp.com
Subject: Draft RAI letter
Attachments: RAI Letter RAIs Sydnor DCI 6 22 11.docx

Cliff and Steve

Attached is a Draft of an RAI letter that'll be going out soon. If you have any question regarding what the request are we can schedule a teleconference call to discuss them.

Regards

Samuel Cuadrado de Jesús
Project Manager
Projects Branch1
Division of License Renewal
U.S. Nuclear Regulatory Commission
Phone: 301-415-2946
Samuel.CuadradoDeJesus@nrc.gov

Hearing Identifier: Davis_BesseLicenseRenewal_Saf_NonPublic
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From: CuadradoDeJesus, Samuel

Created By: Samuel.CuadradoDeJesus@nrc.gov

Recipients:
"'custerc@firstenergycorp.com'" <custerc@firstenergycorp.com>
Tracking Status: None
"dorts@firstenergycorp.com" <dorts@firstenergycorp.com>
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Return Notification: No
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Expiration Date:
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June ~~20~~XX, 2011

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Barry S. Allen
Vice President, Davis-Besse Nuclear Power Station
FirstEnergy Nuclear Operating Company
5501 North State Route 2
Oak Harbor, OH 43449

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE DAVIS-BESSE NUCLEAR POWER STATION (TAC NO.: ME4640)

Dear Mr. Allen:

By letter dated August 27, 2010, FirstEnergy Nuclear Operating Company, submitted an application pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 54 for renewal of Operating License NPF-3 for the Davis-Besse Nuclear Power Station. The staff of the U.S. Nuclear Regulatory Commission (NRC or the staff) is reviewing this application in accordance with the guidance in NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants." During its review, the staff has identified areas where additional information is needed to complete the review. The staff's requests for additional information are included in the enclosure. Further requests for additional information may be issued in the future.

Items in the enclosure were discussed with Cliff Custer, of your staff, and a mutually agreeable date for the response is within 30 days from the date of this letter. If you have any questions, please contact me by telephone at 301-415-2946 or by e-mail at Samuel.CuadradoDeJesus@nrc.gov.

Sincerely,

/RA/

Samuel Cuadrado-De Jesús, Project Manager
Projects Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosure:
As stated

cc w/encl: Listserv

June XX~~20~~, 2011

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Barry S. Allen
Vice President, Davis-Besse Nuclear Power Station
FirstEnergy Nuclear Operating Company
5501 North State Route 2
Oak Harbor, OH 43449

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Sincerely,

/RA/

Samuel Cuadrado-De Jesús, Project Manager
Projects Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosure:
As stated

cc w/encl: Listserv

ADAMS Accession No.: ML~~xxxxxx11167A171~~ *concurrence via email

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OFFICE	LA:DLR/RPB1*	PM:DLR/RPB1	BC:DLR/RPB1
NAME	lKing	SCuadrado	BPham
DATE	06/__~~17~~/2011	06/__~~20~~/2011	06/__~~20~~/2011

OFFICIAL RECORD COPY

Letter to Barry S. Allen from Samuel Cuadrado-De Jesús dated June XX~~20~~, 2011

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SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE DAVIS-BESSE NUCLEAR POWER STATION (TAC NO.: ME4640)

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P. Cooper
C. Sydnor (DCI)~~B. Jose (RIII)~~

B. Harris (OGC)
M. Mahoney

DAVIS-BESSE NUCLEAR POWER STATION
LICENSE RENEWAL APPLICATION
REQUEST FOR ADDITIONAL INFORMATION

Request for Additional Information (RAI) for the Davis-Besse License Renewal Application (LRA), Sections B.2.32, "PWR Reactor Vessel Internals Program," and Section 3.1.2, Table 3.1.2-2, "Aging Management Review Results – Reactor Vessel Internals"

RAI B.2.32-1

Background

By letter dated December 31, 2008, the Electric Power Research Institute submitted Materials Reliability Program (MRP) Report 1016596 (MRP-227), Revision (Rev.) 0, "Pressurized Water Reactor (PWR) Internals Inspection and Evaluation Guidelines," for NRC staff review and approval.

The staff has reviewed MRP-227, Rev. 0 and determined that its guidance will provide acceptable levels of quality and safety with respect to inspection and evaluation (I&E) of reactor vessel (RV) internal components in PWR reactor vessels supplied by Westinghouse, Babcock and Wilcox, and Combustion Engineering. MRP-227, Rev. 0 provides I&E guidelines for implementation by license renewal applicants and licensee's with renewed operating licenses in their plant-specific aging management programs (AMPs) for PWR RV internal components. However the MRP-227, Rev. 0 guidelines will be amended, as specified in the conditions and limitations and identified in Section 4.1 of the staff's Safety Evaluation (SE) concerning MRP-227, Rev. 0, which is currently under development.

Section 4.2 of the SE for MRP-227, Rev. 0 identifies applicant/licensee plant-specific action items that will need to be addressed on a plant-specific basis by license renewal applicants or licensees with renewed operating licenses. These action items address topics related to the plant-specific implementation of MRP-227, as amended by the staff's SE, that could not be effectively addressed on a generic basis in MRP-227, as amended by the staff's SE.

Applicant action item 7 from Section 4.2 of the staff's SE for MRP-227, Rev. 0 requires that license renewal applicants submit a plant-specific application to implement a new AMP for the RV internal components that is based upon the implementation of the MRP-227 guidelines, as amended by the staff's SE for MRP-227, and that applicants' AMP submittals shall include the specific information identified in items (1) through (5) in Section 3.5.1 of the SE for MRP-227, Rev. 0.

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Issue

The applicant has provided a plant-specific AMP submittal for the RV internals as part of the Davis-Besse LRA. The AMP submittal is provided in LRA Section B.2.32, “PWR Reactor Vessel Internals Program.”

As stated in applicant action item 7 from Section 4.2 of the staff’s SE for MRP-227, Rev. 0, the applicant’s PWR RV internals AMP submittal shall include the following ~~the~~ information identified in Section 3.5.1 of the SE for MRP-227:

(1) An AMP for the facility shall address the 10 program elements as defined in NUREG-1801, Rev. 2, Chapter XI, AMP XI.M16A, "PWR Vessel Internals," December 2010 (GALL AMP XI.M16A). The staff notes that LRA Section B.2.32 states that the Davis-Besse RV internals AMP is evaluated against the 10 elements described in Appendix A.1, Section A.1.2.3 of NUREG-1800, “"Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants." LRA Section B.2.32 does not specifically address the 10 program elements defined in GALL AMP XI.M16A from Rev. 2 of the GALL.

(2) To ensure the MRP-227, Rev. 0 guidelines, as amended by the staff's SE, and the plant-specific action items identified in the staff's SE will be carried out by applicants/licensees, applicants/licensees are to submit an inspection plan for staff review and approval consistent with the licensing basis for the plant. The applicant has not identified any plant-specific inspection plan for ensuring the implementation of MRP-227, Rev. 0 guidelines and plant-specific action items, as identified in the staff's SE for MRP-227.

(3) Applicants for license renewal referencing MRP-227, Rev. 0 for aging management of the RV internal components shall ensure that the programs and activities specified in MRP-227, Rev. 0, as amended by the staff's SE, are summarily described in the FSAR supplement.

(4) If the plant's current licensing bas~~ie~~s include specific inspection or analysis requirements for RV internal components in either the operating license for the facility or in the facility's technical specifications (TSs), and these requirements are more comprehensive than the corresponding I&E guidelines in the MRP-227 report, as amended by the staff’s SE, the requirements of the applicable license conditions or TSs take precedence over the corresponding I&E guidelines of the MRP report.

(5) Applicants/licensees who implement MRP-227 must evaluate the current licensing basis for their facilities to determine if they have plant-specific time-limited aging analyses (TLAAs), applicable to RV internal components, which must be addressed. These

TLAAs shall be submitted to the NRC for review along with the submittal for an AMP implementing MRP--227 guidelines, as modified by the staff's SE. The applicant has identified a TLAA applicable to the RV internal components. This TLAA addresses the reduction in fracture toughness for the RV internal components and is described in LRA Section 4.2.7.

The staff notes that, in order for plant-specific PWR RV internals AMPs to be consistent with GALL AMP XI.M16A from Rev. 2 of the GALL, applicants'/licensees' PWR RV internals AMP submittals must address all applicable plant--specific/vendor--specific action items established in Section 4.2 of the staff's SE for MRP--227.

Request

The staff requests that the applicant revise the Davis--Besse PWR RV internals AMP description provided in LRA Section B.2.32 and the corresponding Updated Safety Analysis Report (USAR) Supplement (LRA Section A.1.32) to address each of the five plant--specific AMP information requirements identified in Section 3.5.1 of the SE for MRP--227 (as required by applicant action item 7 from Section 4.2 of the staff's SE for MRP--227) as follows:

(1) LRA Section B.2.32 should be revised to address the 10 elements of an acceptable AMP described in GALL AMP XI.M16A (GALL, Rev. 2, December 2010). Specifically, the AMP's description of the 10 elements should be revised/supplemented as follows to ensure consistency with the 10 elements in GALL AMP XI.M16A:

Element 1, Scope of Program: With respect to program scope, LRA Section B.2.32 must be supplemented to address the applicable plant--specific and vendor--specific license renewal applicant action items (LRAAIs) on the MRP--227 methodology identified in Section 4.2 of the staff's SE for MRP--227, including all the programs and activities discussed in the LRAAI responses credited for aging management of RVI components. The staff notes that the LRAAIs are identified in Section 4.2 of the staff's SE on MRP--227.

Element 2, Preventive Actions: The applicant's description of preventive actions in LRA Section B.2.32 is not consistent with element 2 from GALL AMP XI.M16A. Please revise/supplement the description of preventive actions in LRA Section B.2.32 to ensure that it is consistent with element 2 from GALL AMP XI.M16A.

Elements 3 through 10: Please revise/supplement the description of these program elements in LRA Section B.2.32, as necessary, to ensure that they are consistent with GALL AMP XI.M16A in Rev. 2 of NUREG-1801.

In addition to the above, please revise the subsection in LRA Section B.2.32, titled "NUREG--1801 Consistency," to state that the corresponding AMP is described in NUREG--1801, Rev. 2, GALL Chapter XI, AMP XI.M16A and that the Davis-Besse PWR Reactor Vessel Internals Program is evaluated against the 10 elements described in GALL AMP XI.M16A.

(2) The applicant has not identified any plant--specific inspection plan in LRA Section B.2.32 for ensuring the implementation of MRP--227, Rev. 0 guidelines and plant--specific action items, as identified in the staff's SE for MRP-227. It is necessary for the applicant to either: (1) provide the plant--specific inspection plan based on the final approved version of MRP--227 and the applicant's responses to the plant--specific action items identified in the staff's SE for MRP--227; or (2) provide a specific license renewal commitment to submit the plant--specific inspection plan to the NRC for review and approval no later than two years after issuance of the renewed operating license or two prior to the beginning of the period of extended operation, whichever is earlier.

The staff recognizes that it may not be feasible to submit an adequate inspection plan as part of this RAI response. Therefore, please supplement LRA Sections B.2.32 and A.1.32 to state that a plant--specific inspection plan for ensuring the implementation of MRP--227 program guidelines, as amended by the staff's SE for MRP--227, and Davis--Besse's responses to the plant--specific action items, as identified in the staff's SE, will be submitted for NRC staff review and approval. Also, please include a specific Davis-Besse License Renewal Commitment to submit for NRC review and approval the required plant--specific inspection plan that is based on the final approved version of MRP--227 (as modified by the staff's SE) and Davis-Besse's responses to all applicable plant--specific action items identified in the staff's SE for MRP--227. This License Renewal Commitment shall require the submittal of this inspection plant for NRC review and approval no later than two years after issuance of the renewed operating license or two prior to the beginning of the period of extended operation, whichever is earlier.

(3) LRA Section A.1.32 provides the USAR supplement summary description for the Davis--Besse PWR RV Internals Program. The USAR supplement summary description for this program references the I&E guidelines of MRP--227 and states that the PWR RV Internals Program will be revised, as necessary, to incorporate the final recommendations and requirements published in the staff--approved version of MRP--227. Please include a statement in LRA Section A.1.32 indicating that the PWR RV Internals Program will address all plant--specific action items applicable to Davis--Besse that are established in Section 4.2 of the staff's SE for MRP--227.

(4) The staff found that the Davis--Besse current licensing basis TSs require that the core support shield assembly (CSS) vent valve components be inspected on a 24 month cycle. However, MRP--227, Rev. 0, Table 4--1, "B&W plants Primary components,"

states that the CSS vent valve discs, top retaining ring, bottom retaining ring, disc shaft, and hinge pin will be examined using VT-3 visual methods during the next 10-year inservice inspection (ISI) interval and that subsequent VT-3 examinations will occur on the plant's 10-year ISI interval. As stated above for this item, the requirements of the applicable license conditions or TSs take precedence over the corresponding I&E guidelines of the MRP report. Therefore, based on the above discrepancy between the TS requirements and MRP guidelines for examination frequency for the CSS vent valve components, please provide the information and LRA revisions necessary for resolving this discrepancy. Specifically, either: (1) identify the applicable TS requirement as the governing inspection requirement for the CSS vent valve components, and accordingly, revise the PWR RVI AMP description in LRA Section B.2.32 to state that these TS requirements take precedence over the applicable MRP--227 I&E guidelines for the CSS vent valve components; or (2) submit the necessary TS changes, including technical justification for the proposed TS changes, to implement the less comprehensive MRP--227 I&E guidelines for the CSS vent valve components, in accordance with 10 CFR 54.22.

Similarly to the situation described above for the CSS vent valve components, please provide additional information concerning any other discrepancies between Davis--Besse current licensing basis requirements and the applicable MRP--227 guidelines for I&E of RVI components, and provide the information and LRA revisions necessary for resolving these discrepancies: Specifically, either: (1) identify the applicable TS requirement as the governing requirement for the component, and accordingly, revise the PWR RVI AMP description in LRA Section B.2.32 to state that the applicable TS requirements take precedence over the applicable MRP--227 I&E guidelines for the component; or (2) submit the necessary TS changes, including technical justification for the proposed TS changes, to implement the less comprehensive MRP--227 I&E guidelines for the component, in accordance with 10 CRR 54.22.

(5) The applicant has identified one TLAA applicable to the RV internal components. This TLAA addresses the reduction in fracture toughness for the stainless steel (SS) RV internal components and is described in LRA Section 4.2.7. The description of this TLAA in LRA Section 4.2.7 is limited to the effects of neutron embrittlement on the SS RV internal components' deformation limits and the corresponding ability of the SS RV internal components to absorb local strain at the regions of maximum stress intensity. Please supplement the PWR RV internals AMP description in LRA Section B.2.32 to state how this TLAA will be managed for the period of extended operation (i.e., that reduction in fracture toughness for RV internals will be managed in accordance with the implementation of the MRP--227 guidelines, as modified by the staff's SE, including all activities associated with Davis--Besse's responses to plant--specific action items identified in the staff's SE for MRP--227.)

RAI B.2.32-2

According to Section A.1.4 in MRP-175, "Materials Reliability Program: PWR Internal Aging Degradation Mechanism Screening Threshold Values," susceptibility to stress corrosion cracking (SCC) in nickel-based Alloy X-750 PWR RV internal components depends on the type of heat treatment that is performed on the alloy. High temperature heat treatment (HTH) processes that are used on Alloy X-750 components offer better resistance to SCC than the other age hardened heat treatment processes. The type of heat treatment applied to Alloy X-750 PWR RV internal components is a critical parameter for ensuring that the Davis-Besse PWR RV internals AMP will adequately manage the effects of aging due to SCC for the Alloy X-750 components. Please provide information related to the type of heat treatment process that was used for the Alloy X-750 RV internal components at Davis-Besse.

Please state whether there are any RV internal components fabricated from Alloy X-750 with heat treatment other than HTH, as described above. For any such non-HTH X-750 RV internal components, discuss how the effects of aging due to SCC will be managed, outside the scope of the I&E guidelines described in MRP-227.

RAI B.2.32-3

During the extended period of operation, cast austenitic stainless steel (CASS) PWR RV internal components are susceptible to a reduction in ~~of~~ fracture toughness due to the combined effects of neutron embrittlement and thermal embrittlement, and the potential for irradiation-assisted stress corrosion cracking (IASCC). The synergistic effects of neutron embrittlement and thermal embrittlement may lead to the potential for failure of CASS RV internal components under some design basis loading conditions. Please explain how the Davis-Besse PWR RV internals AMP, as described in LRA Section B.2.32, will account for the reduction in fracture toughness due to the synergistic effects of neutron embrittlement and thermal embrittlement when evaluating CASS components to determine susceptibility to reduction in fracture toughness. The staff notes, in particular, that CASS RV internal components should be initially screened based on casting method, ferrite content, and molybdenum to determine if the components are susceptible to thermal embrittlement, and that components deemed susceptible to thermal embrittlement based on the above screening criteria should receive either supplemental examinations or a component-specific evaluation to ascertain the reduction in fracture toughness due to the synergistic effects of neutron embrittlement and thermal embrittlement.

RAI 3.1.2-## Table 3.1.2-2

LRA Table 3.1.2-2, "Aging Management Review Results – Reactor Vessel Internals," does not address certain RVI components that are listed in the Aging Management Review (AMR) line items found in Chapter IV, Section B4, "Reactor Vessel Internals (PWR) – Babcock and Wilcox," of the GALL Report, Rev. 2.

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GALL, Chapter IV, Section B4, Item No. IV.B4.RP-245 – "Core barrel assembly: (a) upper thermal shield bolts; (b) surveillance specimen holder tube bolts (Davis-Besse, only); (c) surveillance specimen tube holder studs, and nuts (Crystal River Unit 3, only)." For this line item, the staff is only concerned with (b), "surveillance specimen holder tube bolts (Davis-Besse, only)."

GALL, Chapter IV, Section B4, Item No. IV.B4.RP-253 – "Core support shield (CSS) assembly: (a) CSS cast outlet nozzles (Oconee Unit 3 and Davis-Besse, only); (b) CSS vent valve discs." For this line item, the staff is only concerned with (a), "CSS cast outlet nozzles (Oconee Unit 3 and Davis-Besse, only)."

GALL, Chapter IV, Section B4, Item Nos. IV.B4.RP-259 (Incore Monitoring Instrumentation Guide Tube Assembly), IV.B4.RP-260 (Lower Grid Assembly), IV.B4.RP-262 (Lower Grid Assembly), IV.B4.RP-261 (Lower Grid Assembly) – Each of these line items identifies specific welds in the subject assembly. These specific welds are not identified in the listing of components for the corresponding assemblies in LRA Table 3.1.2-2.

If LRA Table 3.1.2-2 addresses the subject components, as identified above, please state the Table 3.1.2-2 Row No. where these components are listed. Otherwise, please supplement LRA Table 3.1.2-2 to address these specific components (for which the staff identified a concern), as stated in the GALL, Rev. 2 AMR line items, and identify the Davis-Besse aging management programs applicable to the management of aging effects for these RV internal components.