UNITED STATES
NUCLEAR REGULATORY COMMISSION
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December 23, 2014

Mr. Vito Kaminskas
Site Vice President - Nuclear Generation
DTE Electric Company
Fermi 2 - 280 OBA
6400 North Dixie Highway
Newport, MI 48166

SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE FERMI 2 LICENSE RENEWAL APPLICATION – SET 16 (TAC NO. MF4222)

Dear Mr. Kaminskas:

By letter dated April 24, 2014, DTE Electric Company (DTE or the applicant) submitted an application pursuant to Title10 of the *Code of Federal Regulations* Part 54, to renew the operating license NPF-43 for Fermi 2, for review by the U.S. Nuclear Regulatory Commission (NRC or the staff). The staff is reviewing the information contained in the license renewal application and has identified, in the enclosure, areas where additional information is needed to complete the review.

These requests for additional information were discussed with Ms. Lynne Goodman, and a mutually agreeable date for the response is February 6, 2015. If you have any questions, please contact me at 301-415-3301 or e-mail Daneira.Melendez-Colon@nrc.gov.

Sincerely,

/RA/

Daneira Meléndez-Colón, Project Manager
Projects Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket No. 50-341

Enclosure:
Requests for Additional Information

cc w/encl: ListServ

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SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE FERMI 2, LICENSE RENEWAL APPLICATION – SET 16 (TAC NO. MF4222)

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FERMI 2
LICENSE RENEWAL APPLICATION
REQUESTS FOR ADDITIONAL INFORMATION - SET 16
(TAC NO. MF4222)

RAI 3.1.2.3.2-2

Background:

License Renewal Application (LRA) Section 4.7.3 discusses the applicant's plant-specific time-limited aging analyses (TLAA) for evaluating loss of preload due to irradiation-assisted stress relaxation or creep in the jet pump auxiliary spring wedge assembly. LRA Section 4.7.4 discusses the applicant's plant-specific TLAA that evaluated relaxation of the jet pump slip joint repair clamps. The applicant dispositioned both of these TLAAs in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 54.21(c)(1)(ii).

Issue:

LRA Table 3.1.2-2 does not include any applicable aging management review (AMR) items for managing loss of preload due to irradiation-assisted stress relaxation or creep in the jet pump spring wedge assemblies and jet pump slip joint repair clamps that are associated with the applicable TLAAs.

Request:

Provide the basis why LRA Table 3.1.2-2 does not include any applicable AMR items to manage loss of preload due to irradiation-assisted stress relaxation or creep in the jet pump auxiliary spring wedge assembly and jet pump slip joint repair clamps that are associated with the applicable plant-specific TLAAs in LRA Sections 4.7.3 and 4.7.4.

RAI 3.1.2.3.2-3

Background:

LRA Table 3.1.2-2 states that the jet pump assembly: slip joint clamp adjustable bolt and ratchet lock spring will be managed by the BWR [boiling water reactor] Vessel Internals Program for cracking and reduction of fracture toughness. The LRA states that the BWR Vessel Internals Program, when enhanced, will be consistent with the program element criteria in "Generic Aging Lessons Learned (GALL) Report" (GALL Report) XI.M9, "BWR Vessel Internals." GALL Report aging management program (AMP) XI.M9 recommends that the jet pump assembly be managed in accordance with the recommended criteria in BWRVIP [boiling water reactor vessel and internals project] Technical Report No. BWRVIP-41.

Issue:

The staff is unclear if the jet pump assembly: slip joint clamp adjustable bolt and ratchet lock spring is within the inspection strategy of BWRVIP-41. The staff could not confirm which

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location in BWRVIP-41, Table 3.3-1, "Matrix of Inspection Options," recommends specific inspection of these components.

Request:

1) Clarify whether the jet pump assembly: slip joint clamp adjustable bolt and ratchet lock spring components are within the scope of BWRVIP-41 and whether the criteria in Table 3.3-1 of BWRVIP-41 recommends specific inspection of these components. If so, identify the inspection methods and frequencies that will be applied to these components.

2) If the components are not within the scope of any inspection methods recommended in the BWRVIP-41 report, clarify and provide the basis on how cracking and reduction of fracture toughness will be managed in the components such that the intended function(s) of the components will be maintained during the period of extended operation.

RAI 3.2.2.3.1-1

Background:

For certain AMR items dealing with carbon steel piping exposed to treated water in LRA Tables 3.2.2-1 through 3.2.2-5, DTE indicates that it will use the One-Time Inspection Program to manage loss of material. DTE assigned generic note G and plant-specific note 203 to these items. Plant-specific note 203 explains that the environment may alternate between wet and dry for the piping that passes through the waterline region of the suppression pool and states that the One-Time Inspection Program will inspect this piping "to manage the potential accelerated loss of material." LRA Section B.1.33, "One-Time Inspection," includes a table that describes activities to confirm the insignificance of aging effects and identifies the piping segments that pass through the waterline region of the suppression pool for the corresponding systems in LRA Tables 3.2.2-1 through 3.2.2-5. For the five entries in the LRA One-Time Inspection Program table, the activity description states that the one-time inspection "will confirm that loss of material is not occurring or is occurring so slowly that the aging effect will not affect the component intended function."

Issue:

There appears to be a disparity between the two statements in the LRA regarding the purpose of the inspection — either to manage the potential accelerated loss of material, or to confirm that loss of material is not occurring or occurring so slowly that the aging effect will not affect the component intended function.

Request:

Clarify the intent of the use of the One-Time Inspection Program for the portions of carbon steel piping passing through the waterline region of the suppression pool. If you determine that loss of material can be accelerated, explain why a one-time inspection is sufficient to manage the effects of aging.

RAI 3.2.2.2-1

Background:

LRA Table 3.2.2-2, "Residual Heat Removal," includes AMR items for nozzles, which are being managed by the Water Chemistry Control – BWR Program. The LRA shows these components with intended functions that include "flow control," but only lists "loss of material" as the aging effect requiring management. LRA Table 2.0-1 defines "flow control" as "provide control of flow rate or establish a pattern of spray."

The only piping listed in LRA Table 3.2.2-2 for this system is carbon steel, which is also being managed for loss of material. The staff noted that piping exposed to Air – Indoor, both internally and externally, is being managed by the External Surfaces Monitoring Program. The associated AMR item (3.2.1-44) notes that for the components where the internal carbon steel surfaces are exposed to the same environment as the external surfaces, external surface conditions will be representative of internal surfaces.

Drawings LRA-M-2083 and LRA-M-2084, "Residual Heat Removal," apparently show the spray headers in the drywell and above the suppression pool. The staff noted that the portions of the residual heat removal system associated with the spray headers inside the drywell are classified as nonsafety-related.

The further evaluation included in NUREG-1800, Revision 2, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants" (SRP-LR), Section 3.2.2.2.5, states that plugging of the spray nozzles can occur in the spray systems for the drywell and suppression chamber, and that this aging effect will apply even though the system is mostly in a standby mode, because components in the system are occasionally wetted. The staff noted that the surveillance requirement for Technical Specification 3.6.2.4, "Residual Heat Removal Suppression Pool Spray," requires at least 500 gallons per minute flow through the suppression pool spray spargers, which periodically wets the piping upstream of the spray nozzles. The SRP-LR states that wetting and drying can accelerate corrosion and fouling, and that the GALL Report recommends further evaluation of a plant-specific AMP to ensure the aging effect is adequately managed. For this issue, the LRA states that the associated AMR item (3.2.1-6) was not used because the spray nozzles are not steel, but instead are copper alloy, which is not subject to general corrosion in an indoor air environment.

Issue:

Although the nozzles in LRA Table 3.2.2-2 have a "flow control" intended function, and are intended to "establish a pattern of spray," the LRA only addresses loss of material for these components and does not appear to consider flow blockage that could result from corrosion product accumulation in the upstream carbon steel piping. As discussed in SRP-LR Section 3.2.2.2.5, the occasional wetting and drying of the upstream carbon steel components can accelerate corrosion, which would result in an accumulation of corrosion products leading to flow blockage of the spray nozzles due to fouling. Flow blockage is not precluded in the spray nozzles simply because they are constructed of a material that is not susceptible to general corrosion in an indoor air environment.

In addition, loss of material on the external surfaces of the spray header piping is being credited for managing loss of material on the internal surfaces, based on the assumption that the environment on the inside of the piping is the same environment as on the outside of the piping. Since the inside of the piping is periodically wetted and any generated corrosion products would tend to accumulate at the bottom of this piping, it is not clear that the environments inside and outside the suppression chamber spray header piping will be sufficiently similar to justify this assumption.

Request:

1) For the drywell spray nozzles verify that the portions of the system inside the drywell are nonsafety-related, as shown on drawings LRA-M-2083, and M-2084, such that the intended function of “flow control” does not need to be considered as part of the aging management review.

    - If “flow control” should be included as part of the aging management review for these components, discuss whether flow blockage could potentially occur in the spray nozzles. Include information on whether the carbon steel piping, downstream of isolation valves E1150-F021A & B, has been wetted since plant operation began, and whether the environment for the interior of the associated carbon steel piping is conducive to an accumulation of corrosion products (e.g., low points that do not drain well).
    - If “flow control” is an intended function of the drywell spray nozzles and flow blockage could potentially occur, state how flow blockage due to fouling will be managed during the period of extended operation.

2) For the suppression chamber spray nozzles, provide the bases that periodic wetting and drying of the upstream carbon steel piping does not result in corrosion product accumulation, which could potentially cause flow blockage. Include the results of previous technical specification surveillances to show that operating experience supports not managing this aging effect.

3) For the AMR items in LRA Table 3.2.2-2, which credit the External Surfaces Monitoring Program to manage internal surfaces of carbon steel components, provide the bases to show that the periodic wetting of the internal surfaces and the potential accumulation of corrosion products on the inside bottom of the components does not cause conditions that result in the need to consider the internal environment as different from the external environment.

RAI 4.7.4-1

Background:

LRA Sections 4.4.7 and A.2.5.4 describe the slip joint repair clamps as being connected to the diffuser and the mixer (throat) in the jet pump assembly. The LRA states that the clamps were installed with a preload that may decrease due to neutron fluence and thermal exposure. The LRA also states that the analysis that evaluated the decrease of the installation preload for the slip joint repair clamp is a TLAA that has been projected to the end of the period of extended operation in accordance with 10 CFR 54.21(c)(1)(ii). The LRA further states that after 52 effective full-power years (EFPY) of plant operation the expected fluence at the location of the repair clamps is 3.07E+18 n/cm^2 (E > 1 MeV), which is below a level necessary (1.0E+19 n/cm^2) to cause stress relaxation in stainless steel.

Issue:

The staff lacks sufficient information to evaluate the jet pump slip joint repair clamp TLAA (LRA Sections 4.4.7) for the period of extended operation and determine if the Updated Final Safety Analysis Report (UFSAR) supplement, LRA Section A.2.5.4, adequately summarizes the TLAA in accordance with 10 CFR 54.21(d). The LRA does not include the following information that the staff needs for its determination: (a) the intended function of the jet pump slip joint repair clamps, (b) how the loss of preload affects the capability of the clamps to perform their intended function, (c) a physical description of the slip joint repair clamp, and (d) the specific methodology and details of the methodology that was used to assess loss of preload in the jet pump slip joint repair clamps during the period of extended operation.

Request:

1) State the intended function of the jet pump slip joint repair clamps and how the loss of preload affects the capability of the clamps to perform their intended function.

2) Provide a physical description or drawing of the slip joint repair clamps. The level of detail in the description should provide for an understanding of the style of clamp construction (e.g., bolted, pressed, pined, keyway) and how the clamps are retained in the jet pump assembly.

3) Provide summaries of the stress and fluence analysis, as applicable, used to evaluate the jet pump slip joint repair clamps for the period of extended operation. The summaries should include the:

   - methodology and pertinent details of the methodology used in the analysis
   - calculations (mathematical modeling, including pertinent safety assumptions or coefficients used in the modeling) used to evaluate the decrease in preload
   - key variables used to evaluate the decrease in preload, such as the design basis preload and minimum value of the preload required for the clamps to perform their intended function
   - basis used to establish the fluence threshold of 1.0E+19 n/cm^2 to cause stress relaxation in stainless steel
   - basis used to determine that the loss of preload that has occurred prior to entering the period of extended operation is acceptable during the period of extended operation

Additionally, if the analysis used to evaluate the jet pump slip joint repair clamps utilized any industrial topical reports or methodologies reviewed and approved by the NRC, provide the references for these documents and the dates of the staff's safety evaluation (SE) approving the reports.

RAI 4.1-1

Background:

LRA Table 4.1-2 states that the current licensing basis (CLB) does not include any flow-induced vibration analyses for the Fermi 2 reactor vessel internal (RVI) components that would need to be identified as TLAAs. The LRA states that the flow-induced vibration analyses for the RVI components are not based on time-dependent assumptions defined by the life of the plant and, therefore, they do not conform to the definition of a TLAA in 10 CFR 54.3.

Issue:

UFSAR Section 1.5.2.3 states that flow-induced vibrations of the RVI components were qualified by prototypical testing performed in accordance with General Electric (GE) Report No. NEDO-24057-P, "Assessment of Reactor Internals Vibration in BWR/4 and BWR/5 Plants," dated November 1977, and this report is the design basis for demonstrating conformance with NRC Regulatory Guide (RG) 1.20, "Comprehensive Vibration Assessment Program for Reactor Internals During Preoperational and Initial Startup Testing." However, the UFSAR does not indicate whether the methodology in GE Report No. NEDO-24057-P includes a time-dependent analysis for qualifying the structural integrity of the RVI components against the consequences of flow-induced vibrations.

Request:

Clarify whether the methodology in GE Report No. NEDO-24057-P includes a time-dependent analysis and whether the analysis is relied upon to qualify the structural integrity of the RVI components against the consequences of flow-induced vibrations. If the analysis is time-dependent, provide justification as to why it would not need to be identified as a TLAA when compared to the six criteria in 10 CFR 54.3(a).

RAI 4.1-2

Background:

Section 2.4 of the NRC's December 7, 2000, safety evaluation (ML003775989) on Electric Power Research Institute (EPRI) Technical Report BWRVIP-25, "BWR Core Plate Inspection and Flaw Evaluation Guidelines," states that the analysis for loss of preload due to stress relaxation for the core plate rim holddown bolts is a generic TLAA that was demonstrated to be acceptable in accordance with 10 CFR 54.21(c)(1)(ii) (i.e., the generic analysis was projected to the end of a postulated period of extended operation). As a result, the staff's safety evaluation includes Applicant Action Item (AAI) No. 4 on the BWRVIP-25 methodology and recommends that BWR applicants for license renewal identify and evaluate whether the analysis of stress relaxation in core plate rim hold down bolts is a TLAA.

The applicant provided its response to AAI No. 4 in LRA Appendix C. The LRA states that the core plate design relies on pre-tensioned rim holddown bolts to maintain position during normal and transient operations and postulated design-basis and seismic events. To address

AAI No. 4, the LRA also states that the applicant will enhance the BWRVIP to perform one of the following two options:

1) install wedges in the core plate design prior to entering the period of extended operation

2) complete a plant-specific analysis to determine acceptance criteria for continued inspection of the core plate rim holddown bolts in accordance with BWRVIP-25 and submit the inspection plan, along with the acceptance criteria and justification for the inspection plan, to the NRC two years prior to entering the period of extended operation

The applicant included these enhancements in LRA Section A.1.10 and LRA Table A.4, Commitment No. 7.

Issue:

Commitment No. 7 needs to be clarified, particularly if the second option is selected as the basis for managing aging of the core plate rim holddown bolts.

(a) Option 2 in LRA Table A.4, Commitment No. 7, does not address whether the analysis will evaluate loss of preload due to stress relaxation in the core plate rim holddown bolts and whether the analysis will quantify the loss of preload/stress relaxation that will occur in these bolts during the period of extended operation.

(b) Presuming that the analysis in response to Issue (a) of this RAI will be a loss of preload/stress relaxation analysis, Option 2 of Commitment No. 7 does not identify whether the analysis will be based on the generic loss of preload/stress relaxation analysis in BWRVIP-25, which was approved in the NRC safety evaluation of December 7, 2000, or a plant-specific loss of preload/stress relaxation analysis applicable to the Fermi 2 core plate rim holddown bolts.

(c) Option 2 of LRA Commitment No. 7 does not require submittal of the applicable analysis for NRC approval (i.e., if not already approved by the NRC).

Request:

(a) Clarify whether the specific analysis in Option 2 of LRA Commitment No. 7 will address loss of preload due to stress relaxation in the core plate rim holddown bolts, and if so, whether the analysis will quantify the loss of preload/stress relaxation that will occur in these bolts during the period of extended operation. If not, justify why the analysis would not quantify the amount of preload loss/stress relaxation that would occur in the core plate rim holddown bolts at the end of the period of extended operation.

(b) Clarify whether the analysis referred to in this commitment will be a plant-specific loss of preload/stress relaxation analysis for the core plate rim holddown bolts or the generic analysis loss of preload/stress relaxation analysis that was evaluated in BWRVIP-25 and approved in the NRC SE of December 7, 2000. If the analysis will be the generic analysis in BWRVIP-25, provide your basis why the analysis has not been identified as a TLAA for the LRA and evaluated (with justification) in accordance with one of the TLAA acceptance requirements in 10 CFR 54.21(c)(1)(i), (ii), or (iii), and justify why the generic core plate rim holddown analysis is considered to be bounding and acceptable for the design and loadings of the core plate assembly at Fermi 2.

(c) Explain why Option 2 of Commitment No. 7 does not require the loss of preload/stress relaxation analysis to be submitted for NRC approval (i.e., if the analysis has not already been demonstrated to be applicable to the bolt design at Fermi 2 and approved by the staff).

RAI 4.1-3

Background:

In the staff's December 7, 2000, safety evaluation (ML003776110) on EPRI Technical Report BWRVIP-26-A, "BWR Top Guide Inspection and Flaw Evaluation Guidelines," the staff included AAI No. 4 for identification of any plant-specific TLAAs that may be applicable to the evaluation of BWR top guide components. Specifically, AAI No. 4 states that BWR applicants for license renewal should identify and evaluate the impact of accumulated neutron fluence on the potential to initiate irradiation-assisted stress corrosion cracking (IASCC) in BWR top guide components and evaluate whether such an evaluation is a TLAA. In response to AAI No. 4, LRA Appendix C states that the 60-year projected fluence exceeds the threshold for the initiation of IASCC in the Fermi 2 top guide and its subcomponents. However, the LRA also states that the methodology in BWRVIP-26-A does not include any analyses that would constitute a TLAA for Fermi 2 because this report was not used to make any safety determination or to justify a reduction to the number of inspections for these components. The LRA further states that, since the applicant has implemented the inspection requirements of BWRVIP-26-A and BWRVIP-183, the BWR Vessel Internals Program will adequately manage the effects of aging on the top guide assembly for the period of extended operation.

Issue:

Appendix B of BWRVIP-26-A includes a generic flaw analysis for postulated cracks in BWR top guide grid beam components. This flaw analysis uses a proprietary upper bound fluence value as the basis for the critical stress intensity value. Therefore, it is not evident as to why the neutron fluence-dependent IASCC analysis for the top guide grid beam locations would not need to be identified as a TLAA, particularly because the applicant is relying on the flaw evaluation in BWRVIP-26-A to justify the conservatisms and validity of the augmented inspection methods and frequencies for the top guide grid beam locations at Fermi 2.

Request:

Clarify whether the flaw evaluation for BWR top guide grid beam locations in BWRVIP-26-A, Appendix B, is relied upon to justify the conservatisms and validity of the augmented inspection methods and frequencies for the top guide grid beam locations at Fermi 2. If so, provide justification as to:

1) Why the flaw evaluation for verification of the inspection and flaw evaluation methods in BWRVIP-26-A is not part of the safety basis decision or determination for implementing the BWRVIP-26-A guidelines as part of the BWR Vessel Internals Program, and

2) Why the generic flaw evaluation for the BWR top guide grid beam locations in BWRVIP-26-A, Appendix B, has not been identified as a TLAA when compared to the six criteria for TLAAs in 10 CFR 54.3(a).

RAI 4.1-4

Background:

The staff's December 20, 1999, safety evaluation (ML993630179 and ML993630186) on EPRI Technical Report BWRVIP-27-A, "BWR Standby Liquid Control System/Core Plate ΔP Inspection and Flaw Evaluation Guidelines," includes AAI No. 4 for addressing plant-specific TLAAs that may be applicable to the evaluation of BWR standby liquid control (SLC) and core ΔP nozzle components. AAI No. 4 states that BWR applicants who reference BWRVIP-27-A for license renewal should identify and evaluate the projected fatigue cumulative usage factors as a potential TLAA for their SLC and core ΔP lines. In response to AAI No. 4, LRA Appendix C states that the BWRVIP-27-A fatigue analysis for the SLC and core ΔP line for 60 years of operation is a TLAA. The LRA also states that, at Fermi 2, the SLC and core ΔP lines inside the reactor pressure vessel (RPV) are not subject to an AMR.

Issue:

(a) UFSAR Section 4.5.2.4.3 states that the SLC system is needed to remain operable in order to comply with the requirements of 10 CFR 50.62, "Requirements for Reduction of Risk from Anticipated Transients without Scram (ATWS) Events for Light-Water-Cooled Nuclear Power Plants." UFSAR Section 4.5.1.2.11 states that portions of the SLC and core ΔP lines internal to the RPV are needed to facilitate good mixing and dispersion of boron into the RPV when the SLC system is activated. The UFSAR also states that the portions of the SLC and core ΔP lines internal to the RPV also reduce thermal shock to the SLC and core ΔP nozzle. Given this information, it is not clear why the portions of the SLC and core ΔP lines internal to the RPV are not identified as within the scope of license renewal in accordance with:

- 10 CFR 54.4(a)(2), because the failure of the SLC line inside the RPV would result in its becoming incapable of mitigating a thermal shock to the RPV's SLC and core ΔP nozzle (a safety-related component that is part of the reactor coolant pressure boundary component), and

- 10 CFR 54.4(a)(3), because the SLC line inside the RPV is relied upon to properly mix and disperse boron-10 inside the reactor following an ATWS event.

(b) The applicant's response to AAI No. 4 does not sufficiently demonstrate that the LRA does not need to include a metal fatigue analysis (i.e., CUF analysis) or other type of cycle loading TLAA for those portions of the SLC and core ΔP line that are internal to the RPV.

Request:

(a) Justify why those portions of the SLC and core ΔP line internal to the RPV have not been identified as within the scope of license renewal. In the response, indicate whether these components are in-scope under 10 CFR 54.4(a)(1), 10 CFR 54.4(a)(2), or 10 CFR 54.4(a)(3). If these components are within the scope of license renewal, provide the basis for why they are not subject to aging management review, as required by 10 CFR 54.21(a)(1) for passive, long-lived structures, systems and components .[1] Amend the LRA accordingly if it is determined that these components are subject to an AMR.

(b) Identify the design code or design analyses of record used for the design of those portions of the SLC and core ΔP lines that are internal to the RPV (i.e., not inclusive of the SLC and core ΔP nozzle adjoined to the RPV). Clarify whether the design code or design analyses of record include a metal fatigue analysis or other type of cyclical loading analysis (e.g., cycle-based expansion stress or maximum allowable stress range reduction analysis or a fatigue waiver analysis) for those portions of the SLC and core ΔP line that are internal to the RPV. If so, explain why the analysis would not need to be identified as a TLAA when compared to the six criteria for TLAAs in 10 CFR 54.3(a).

RAI 4.1-5

Background:

In its response to AAI No. 6 on EPRI Technical Report BWRVIP-76-A, "BWR Core Shroud Inspection and Flaw Evaluation Guidelines," LRA Appendix C states that the core shroud is fabricated from Type 304L stainless steel and that its aging effects are loss of material and cumulative fatigue damage. The LRA states that the BWR Vessel Internals Program and Water Chemistry Control – BWR Program will manage loss of material due to pitting and crevice corrosion that may occur in the core shroud during the period of extended operation. The LRA also states that no cracking of vertical (axial) or horizontal (circumferential) weld seams in the core shroud have been detected; therefore, no repair design modifications for the core shroud have been implemented. The LRA further states that the metal fatigue TLAAs for the RVI components are evaluated in LRA Section 4.3.1.4.

Issue:

LRA Appendix C states that the evaluation of the metal fatigue TLAAs for the RVI components are in LRA Section 4.3.1.4; however, LRA Section 4.3.1.4 does not indicate which design code or specification was used for the design and fabrication of the core shroud, nor does it indicate whether the design code or specification required a metal fatigue analysis or other type of cyclical loading analysis for the core shroud and its subcomponents.

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[1] That is systems, structures, or components that are not active or subject to moving parts, or that are not subject to replacement based on a specified time period or qualified life.

Request:

Identify the design code or design specification of record that was used for the design and fabrication of the core shroud. Clarify whether the design code or design specification of record required a metal fatigue analysis or other type of cyclical loading analysis (e.g., cycle-based expansion stress or maximum allowable stress range reduction analysis or a fatigue waiver analysis) for the design of the core shroud. If so, provide justification as to why the analysis would not need to be identified as a TLAA when compared to the six criteria for TLAAs in 10 CFR 54.3(a).

RAI 4.1-6

Background:

LRA Section 4.1.2 states that the applicant performed a search to find any exemptions that were granted for the Fermi 2 CLB in accordance with the exemption approval criteria in 10 CFR 50.12 and based on a TLAA. The LRA states that this search was based on a review of relevant licensing basis or design basis information in the UFSAR, American Society of Mechanical Engineers (ASME) Code, Section XI, program documentation, fire protection documentation, operating license, Technical Specifications, and docketed correspondence. The LRA states that the applicant did not find any exemptions that are based on a TLAA and that will remain in effect for the period of extended operation.

Issue:

Pursuant to 10 CFR 54.21(c)(2), the applicant is required to identify a particular exemption as part of the LRA if the exemption was granted in accordance with the requirements of 10 CFR 50.12 and the exemption is based on a TLAA. For exemptions that meet these criteria, the requirements in 10 CFR 54.21(c)(2) apply regardless of whether the exemptions will remain in effect for the period of extended operation. Therefore, LRA Section 4.1.2 may have omitted exemptions that were granted in accordance with 10 CFR 50.12 and are based on a TLAA, but will not remain in effect for the period of extended operation. Any such omissions would not be in compliance with the requirements of 10 CFR 54.21(c)(2).

Request:

Identify all exemptions that were granted in accordance with 10 CFR 50.12 and are based on a TLAA but will not remain in effect for the period of extended operation.

RAI 4.1-7

Background:

LRA Section 4.1.2 states that the applicant performed a search to find any exemptions that were granted for the Fermi 2 CLB in accordance with the exemption approval criteria in 10 CFR 50.12 and based on a TLAA. The LRA states that this search was based on a review of relevant licensing basis or design basis information in the UFSAR, ASME Code, Section XI, program documentation, fire protection documentation, operating license, Technical Specifications, and docketed correspondence. The LRA states that the applicant did not find any exemptions that are based on a TLAA and that will remain in effect for the period of extended operation.

Issue:

UFSAR Section 6.2 states that the NRC granted a number of exemptions from meeting the requirements of 10 CFR Part 50, Appendix J, Option B, for the containment leak rate testing program. The UFSAR does not describe what these exemptions involve or whether the alternative testing requirements or exceptions authorized by the exemptions are based on or supported by a time-dependent analysis. Therefore, additional information is needed to determine whether these exemptions are based on a TLAA.

Request:

Describe each exemption from the 10 CFR Part 50, Appendix J, leak rate testing requirements and explain whether the alternative testing requirements or exceptions authorized by each exemption are based on or supported by a time-dependent analysis, calculation, or evaluation that conforms to the six criteria for TLAAs in 10 CFR 54.3. If it is determined that a specific 10 CFR Part 50, Appendix J, leak rate testing exemption was granted under 10 CFR 50.12 and is based on a TLAA, amend the LRA, as appropriate, to identify and evaluate the exemption in accordance with the requirements in 10 CFR 54.21(c)(2).