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10 CFR 50.55a

July 1, 2021
NRC-21-0032

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

Fermi 2 Power Plant
NRC Docket No. 50-341
NRC License No. NPF-43

Subject: Response to Request for Additional Information Regarding Revised Relief Request RR-A39 for the Fourth Ten-Year Inservice Inspection Interval

- References:**
- 1) DTE Letter NRC-20-0054, "Submittal of Revised Relief Request RR-A39 for the Fourth Ten-year Interval," dated December 30, 2020 (ML20365A043)
 - 2) NRC E-mail Capture, "Fermi 2 - Request for Additional Information for Revised Relief Request RR A-39 (EPID L-2020-LLR-0161)," dated May 4, 2021 (ML21126A053)
 - 3) DTE Letter NRC-21-0007, "Response to Request for Additional Information Regarding Revised Relief Request RR-A39 for the Fourth Ten-year Interval," dated May 27, 2021 (ML21147A495)
 - 4) Notice of Meeting between the NRC staff and the Electric Power Research Institute, dated April 20, 2021 (ML21111A087)

In Reference 1, DTE submitted a revision to NRC-approved relief request RR-A39 regarding the use of Boiling Water Reactor Vessel Internals Project guidelines in lieu of ASME Code requirements. In the Reference 2 email from Mr. Surinder Arora to Ms. Margaret Offerle dated May 4, 2021, the NRC sent DTE a Request for Additional Information (RAI) regarding the revised relief request. The response to the first question, RAI-1, was previously provided in Reference 3. The response to the second question, RAI-2, is enclosed. The response incorporates relevant information from the May 27, 2021 meeting identified in Reference 4.

No new commitments are being made in this submittal.

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Should you have any questions or require additional information, please contact Mr. Ertman L. Bennett III, Manager – Nuclear Licensing, at (734) 586-4273.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. Dietrich', written in a cursive style.

Peter Dietrich
Senior Vice President and Chief Nuclear Officer

Enclosure: 1) Response to Request for Additional Information

cc: NRC Project Manager
NRC Resident Office
Regional Administrator, Region III

**Enclosure 1 to
NRC-21-0032**

**Fermi 2 NRC Docket No. 50-341
Operating License No. NPF-43**

Response to Request for Additional Information

Response to Request for Additional Information

By letter dated December 30, 2020 (Agencywide Documents and Access Management System (ADAMS) Accession No. ML20365A043), DTE Electric Company (DTE or the licensee) submitted revised relief request RR-A39 for the Fourth Ten-Year Inservice Inspection Interval at the Enrico Fermi Nuclear Generating Station, Unit 2 (Fermi 2). DTE requested authorization to utilize BWRVIP Guidelines in lieu of the applicable Section XI requirements for Examination Categories B-N-1 and B-N-2. The revised submittal proposes the use of BWRVIP-25-R1-A, BWRVIP-41-R4-A, and BWRVIP-48-R1 in lieu of the previous revisions of these documents as approved in the original submittal per letter dated July 20, 2019.

Regulatory Basis

Pursuant to Title 10 of the Code of Federal Regulations (10 CFR), Part 50, Paragraph 50.55a(z)(1), the licensee proposed to utilize BWRVIP Guidelines in lieu of the applicable Section XI requirements for Examination Categories B-N-1 and B-N-2. 10 CFR 50.55a(z)(1) requires the licensee to demonstrate that the proposed alternative provides an acceptable level of quality and safety.

The NRC staff needs to issue requests for additional information (RAIs) to complete its review of the licensee's proposed alternative.

Requests for Additional Information

RAI-2

Issue

The NRC staff has become aware of a possible non-conservatism associated with the fracture toughness model published in BWRVIP-100, Rev. 1-A, "Updated Assessment of the Fracture Toughness of Irradiated Stainless Steel for BWR Core Shrouds" and incorporated into BWRVIP-235, "BWR Vessel and Internals Project, Structural Analysis Software for BWR Internals, DLL Version 3.1." This issue has been communicated to applicable recipients through a 10 CFR Part 21, transfer of information notice, dated February 19, 2021 and updated on March 19, 2021. Furthermore, this information was communicated to the NRC on a letter dated March 22, 2021 (ADAMS Accession No. ML21084A164)

The NRC staff is aware that this possible non-conservatism exists in a fluence range of 5×10^{20} n/cm² to 3×10^{21} n/cm². More specifically, additional experimental data suggests the lower bound fracture toughness of 50 ksi-√in is applicable at fluences of or greater than 5×10^{20} n/cm² as opposed to the defined threshold of 3×10^{21} n/cm².

The NRC staff has also become aware that this non-conservatism could potentially impact BWRVIP-76, Revision 1-A, BWRVIP-76, Revision 2, and BWRVIP Letter 2016-030. As a result, EPRI has determined that these documents cannot be used in their entirety as written.

Furthermore, EPRI states that details on the specific impacts and recommended actions associated with BWRVIP-76, Revision 1-A, are included in Attachment 2. The NRC staff does not have access to the attachments provided in the Part 21 transfer of information notice.

The staff notes that BWRVIP-100, Rev. 1-A and BWRVIP-76-R1-A are included in the submittal's table titled, "BWRVIP Guidelines Used for Section XI Code Examinations (Part of this Request)."

Request

- a) *Provide detailed information on the applicability and intended use of BWRVIP-100, Rev. 1-A, as it applies to the applicable Section XI examinations that are being replaced by BWRVIP programs. Furthermore, the staff would like to know if the Part 21, transfer of information notices are applicable to Fermi 2. Within your response, provide the actions taken and/or planned to address the identified non-conservatism as applicable within the purview of this application.*
- b) *Section 5 of the submittal includes a table titled, "BWRVIP Guidelines Used for Section XI Code Examinations." Note (3) of the table references the applicability of BWRVIP-76, Revision 1-A. Provide information on how Fermi 2 is addressing EPRI's statement in regard to stopping the specified use of BWRVIP-76, Revision 1-A. Include which specific elements were impacted and which EPRI recommended actions are being taken (if applicable). If BWRVIP-76, Revision 1-A has been previously implemented, within your response, provide details on how this document was used within the purview of this application.*

DTE RESPONSE

The 10 CFR 21 communication from Electric Power Research Institute (EPRI) regarding the potential non-conservatism of BWRVIP-100 Rev. 1-A, captured in communication to the NRC in Reference 1.1 of this Enclosure, was received by DTE Electric Company (DTE) and promptly entered into the Fermi 2 Corrective Action Program (CAP) for review and evaluation. DTE also participated in the May 27, 2021 meeting between EPRI and the NRC, announced in Reference 1.2 of this Enclosure, to discuss the issue. Responses to the NRC requests are provided below based on the DTE CAP evaluation, including incorporation of feedback from the May 27, 2021 meeting.

- a) As noted in BWRVIP-100 Rev. 1-A Section 1.5, "Implementation Requirements," the only "Needed" guidance per NEI 03-08, "Guideline for the Management for Materials Issues," within BWRVIP-100 Rev. 1-A is Section 4.1.4, which exclusively deals with the fracture toughness correlations forming the subject of the potential non-conservatism identified by EPRI. Therefore, DTE hereby withdraws the request to use BWRVIP-100 Rev. 1-A as part of the RR-A39 relief request submitted by DTE in Reference 1.3 of this Enclosure.

EPRI is working to revise the fracture toughness correlations currently present in BWRVIP-100 Rev. 1-A. Once it has been revised by EPRI, DTE will implement the updated guidance approved for use by the BWRVIP Executive Committee in accordance with NEI 03-08. If use of the updated guidance was desired to be incorporated to a relief request, approval would be requested as needed in accordance with 10 CFR 50.55a. During the May 27, 2021 meeting, EPRI provided the NRC with a preliminary assessment of the fracture toughness correlations compared to the original guidance from BWRVIP-100 Rev. 1-A.

DTE has reviewed the 10 CFR 21 notice in Reference 1.1 for applicability and recommendations. Fermi 2 has no indications of intergranular stress corrosion cracking (IGSCC) associated with the core shroud. However, two shroud welds have to-date accrued, or will have accrued by end of plant life (52 EFPY), fluence greater than or equal to 5×10^{20} n/cm² and therefore the 10 CFR 21 notice is applicable to those two welds.

DTE has reviewed current plant-specific analyses related to vessel internals, including inspection interval technical bases and proactively performed flaw evaluation handbooks. Only those analyses specific to the two core shroud welds describe above were impacted by the 10 CFR 21 notice. DTE will revise the applicable analyses after the BWRVIP Executive Committee approves updated guidance related to the fracture toughness correlations originally present in BWRVIP-100 Rev. 1-A and/or BWRVIP-235. DTE has determined no additional examinations are required to address the 10 CFR 21 notice at this time. DTE may elect to perform supplementary examinations to develop further input for core shroud analysis revisions. The BWRVIP has initiated new tasks to address the 10 CFR 21 notice, as well as convened a Focus Group to provide for utility input (of which DTE is an active member for Fermi 2). Based on the conservatism inherent to the core shroud analyses and the fact that the Fermi 2 core shroud has no indications of IGSCC, DTE has reasonable assurance that the 10 CFR 21 notice does not reveal a substantial safety hazard such as a loss of a safety function to the extent that a major reduction in the degree of protection provided to the public health and safety exists, or would have existed, had the issue gone unnoticed or uncorrected.

- b) Section 5 of the Reference 1.3 relief request provided a table showing which BWRVIP guidelines were included in the relief request. As described in the response to part (a) above, the request to use BWRVIP-100 Rev. 1-A has been withdrawn. The table also includes a note which relates BWRVIP-76-R1-A to BWRVIP-100 Rev. 1-A. Due to withdrawal of the request to use BWRVIP-100 Rev. 1-A, Note 3 of the Table “BWRVIP Guidelines Used for Section XI Code Examinations” is also withdrawn, as the fracture toughness values provided in BWRVIP-100 Rev. 1-A are found to be potentially non-conservative as identified in the 10 CFR 21 notice. As previously noted, DTE will implement the revised fracture toughness evaluation criteria after it has been reviewed and approved by the BWRVIP Executive Committee and issued to the BWRVIP utility members.

DTE has determined that the inspection criteria present in BWRVIP-76 Rev. 1-A remain more conservative when compared with the requirements of ASME Section XI (see Attachment 1 of the Reference 1.3 relief request), and plans to continue implementing those more conservative requirements (as modified by applicable EPRI recommendations) until the

BWRVIP provides an Executive Committee approved alternative to BWRVIP-76 Rev. 1-A. For evaluation purposes, if revised fracture toughness criteria reviewed and approved by the BWRVIP Executive Committee are not available, but DTE emergent reevaluation is required to address Fermi 2 conditions associated with the core shroud, the preliminary assessment criteria provided by EPRI in the May 27, 2021 meeting will be utilized by DTE.

EPRI has provided preliminary instructions to allow for continued use of BWRVIP-235, if necessary. DTE has no plans at this time to utilize BWRVIP-235 prior to formal revision of the software to address the non-conservatism. EPRI has also provided preliminary recommendations related to revisions to the inspection interval and flaw evaluation guidance present in BWRVIP-76 Rev. 1-A. DTE's review concludes that flaw analysis revision is not an immediate requirement since the analysis was proactively produced and no IGSCC flaws are known to exist. DTE's review also concludes that the BWRVIP-76 Rev. 1-A recommended inspection interval revisions have not resulted in any missed examinations. DTE plans to programmatically incorporate revised inspection and evaluation guidance after it is reviewed and approved by the BWRVIP Executive Committee.

BWRVIP-76 Rev. 1-A has previously been implemented at Fermi 2, with the previous examination having been performed during RF18 (2017). Five welds (including those two shroud welds with sufficient fluence for applicability to the 10 CFR 21 notice as described above) were examined via double-sided ultrasonic testing (UT). No relevant indications were identified. The examination requirements within BWRVIP-76 Rev. 1-A (EVT-1, UT) provide superior flaw characterization and detection than those present in ASME Section XI for Integrally Welded Core Support Structures (B-N-2), and as such BWRVIP-76 Rev. 1-A was originally included in this relief request as it provides a more stringent level of quality and safety. DTE will retain BWRVIP-76 Rev. 1-A as part of the relief request RR-A39.

References:

- 1.1) EPRI Letter 2021-030, "Potential Non-Conservatism in EPRI Report, BWRVIP-100, Rev. 1-A, 3002008388 and Impacted BWRVIP Reports," dated March 22, 2021 (ML21084A164).
- 1.2) Notice of Meeting between the NRC staff and the Electric Power Research Institute, dated April 20, 2021 (ML21111A087).
- 1.3) DTE Letter NRC-20-0054, "Submittal of Revised Relief Request RR-A39 for the Fourth Ten-year Interval," dated December 30, 2020 (ML20365A043).