UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 16, 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 14 (TAC NO. MF4222)

Dear Mr. Kaminskas:

By letter dated April 24, 2014, DTE Electric Company 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 within 30 days from the date of this letter. 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

December 16, 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 14 (TAC NO. MF4222)

Dear Mr. Kaminskas:

By letter dated April 24, 2014, DTE Electric Company submitted an application pursuant to Title 10 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 within 30 days from the date of this letter. 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

DISTRIBUTION: See next page

ADAMS Accession No.: ML14335A188 ***Concurred via e-mail**

OFFICE	LA:RPB1:DLR	PM:RPB1:DLR	PM:RPB1:DLR	BC:RPB1:DLR	PM:RPB1:DLR
NAME	YEdmonds*	DMeléndez-Colón	LRobinson*	YDíaz-Sanabria	DMeléndez-Colón
DATE	12/9/14	12/11/14	12/12/14	12/16/14	12/16/14

OFFICIAL RECORD COPY

SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE FERMI 2, LICENSE RENEWAL APPLICATION – SET 14 (TAC NO. MF4222)

DISTRIBUTION:

E-MAIL:
PUBLIC
RidsNrrDlr Resource
RidsNrrDlrRpb1 Resource
RidsNrrDlrRpb2 Resource
RidsNrrDlrRerb Resource
RidsNrrDlrRarb Resource
RidsNrrDlrRasb Resource
RidsNrrDlrRsrg Resource
RidsNrrPMFermi2 Resource

D. Melendez-Colon
Y. Diaz-Sanabria
M. Wentzel
B. Wittick
D. McIntyre, OPA
C. Kanatas, OGC
D. Roth, OGC
M. Kunowski, RIII
B. Kemker, RIII
V. Mitlyng, RIII
P. Chandrathil, RIII
A. Stone, RIII
S. Sheldon, RIII

FERMI 2
LICENSE RENEWAL APPLICATION
REQUESTS FOR ADDITIONAL INFORMATION SET 14
(TAC NO. MF4222)

RAI B.1.12-1

Background:

Section 54.21(a)(3) of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 54 requires that the applicant demonstrate that the effects of aging for structures and components will be adequately managed so that the intended function(s) will be maintained consistent with the current licensing basis (CLB) for the period of extended operation. As described in the "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants" (SRP-LR), an applicant may demonstrate compliance with 10 CFR 54.21(a)(3) by referencing the Generic Aging Lessons Learned (GALL) Report and when evaluation of the matter in the GALL Report applies to the plant.

The "detection of aging effects" program element of GALL Report aging management program (AMP) XI.S1, "ASME Section XI, Subsection IWE," recommends that the program is augmented to require surface examination, in addition to visual examination, to detect cracking in stainless steel penetration sleeves, dissimilar metal welds, bellows, and steel components that are subject to cyclic loading but have no CLB fatigue analysis. This program element also states that, where feasible, appropriate Appendix J tests (AMP XI.S4) may be performed in lieu of surface examination.

The "Program Description" of GALL Report AMP XI.S1 states that "[t]he program is also augmented to require surface examination of dissimilar metal welds of vent line bellows in accordance with examination Category E-F, as specified in the 1992 Edition of the ASME Code, Section XI, Subsection IWE."

License Renewal Application (LRA) Section B.1.12 states that Fermi 2 primary containment is a General Electric Mark I pressure suppression steel containment consisting of a drywell, a torus, and a connecting vent system. LRA Section B.1.12, "Containment Inservice Inspection - IWE," states that the existing program, with the enhancements, will be consistent with GALL Report AMP XI.S1.

During the audit, the staff noted that the "detection of aging effects" program element in the LRA AMP basis document (FERMI-RPT-12-LRD05, Revision 1, Section 3.2) states that stainless steel penetration sleeves, dissimilar metal welds, bellows, and steel components that are subject to cyclic loading but have no CLB fatigue analysis are monitored for cracking. It also states that, XI.S4 Containment Leak Rate Program (10 CFR Part 50, Appendix J) tests may be performed in lieu of surface examination.

Issue:

It is not clear to the staff that the statements noted above for the "detection of aging effects" program element are consistent with the GALL Report because the LRA AMP basis document does not state that supplemental surface examinations will be performed, in addition to visual

ENCLOSURE

examinations, to detect cracking in stainless steel penetration sleeves, dissimilar metal welds, bellows, and steel components that are subject to cyclic loading but have no CLB fatigue analysis. Further, if the option to perform appropriate Appendix J tests, in lieu of surface examinations, will be used for any of the mentioned components, the LRA AMP does not mention the type of Appendix J test that would be performed for the specific components in order for the staff to evaluate the appropriateness of the test to detect cracking in these components prior to loss of intended function.

Request:

1. State whether the supplemental surface examination recommended in GALL Report AMP XI.S1 will be performed, in addition to visual examination, to detect cracking in the following containment pressure boundary components: (1) stainless steel and dissimilar metal welds of penetration sleeves, penetration bellows, and vent line bellows and (2) steel components that are subject to cyclic loading but have no CLB fatigue analysis, if any. If supplemental surface examinations will be performed, indicate what standard will be used to perform surface examinations of stainless steel and dissimilar metal welds.

2. If an Appendix J test is used to detect cracking, in lieu of supplemental surface examination, for the components noted in Request 1, indicate the type of Appendix J test that will be used for the applicable components, and justify its appropriateness to detect cracking prior to loss of intended function.

3. If supplemental examinations will not be performed or supplemental examination methods other than those described in GALL Report AMP XI.S1 will be used, justify the adequacy of the proposed exception regarding the method to identify the aging effects of cracking in the components noted in Request 1.

4. Update the LRA and Updated Final Safety Analysis Report (UFSAR) supplement, as applicable, to be consistent with the responses to the above requests.

RAI B.1.12-2

Background:

Section 54.21(a)(3) of 10 CFR requires that the applicant demonstrate that the effects of aging for structures and components will be adequately managed so that the intended function will be maintained consistent with the CLB for the period of extended operation. As described in the SRP-LR, an applicant may demonstrate compliance with 10 CFR 54.21(a)(3) by referencing the GALL Report and when evaluation of the matter in the GALL Report applies to the plant.

The “preventive action” program element of GALL Report AMP XI.S1 recommends that the program be augmented to include preventive actions that ensure that moisture levels associated with an accelerated corrosion rate do not exist in the exterior portion of the BWR Mark I steel containment drywell shell. The actions consist of ensuring that the sand pocket area drains and/or the refueling seal drains are clear.

The “parameters monitored or inspected” program element of GALL Report AMP XI.S1 recommends that “applicants with BWR Mark I steel containments should monitor the sand pocket area drains and/or the refueling seal drains for water leakage. The licensees should ensure the drains are clear to prevent moisture levels associated with accelerated corrosion rates in the exterior portion of the drywell shell.” LRA Section B.1.12 states that Fermi 2 primary containment is a General Electric Mark I pressure suppression steel containment consisting of a drywell, a torus, and a connecting vent system. LRA Section B.1.12, "Containment Inservice Inspection - IWE," states that the existing program, with enhancements, will be consistent with GALL Report AMP XI.S1.

To demonstrate consistency with the recommendations for a BWR Mark I containment drywell shell in the GALL Report AMP, LRA Sections A.1.12 and B.1.12 include enhancements to program elements that will be implemented prior to the period of extended operation. The “preventive action” program element of the LRA AMP includes an enhancement (Commitment 9a in LRA Section A.4) to revise plant procedures to require inspection of the sand pocket drain lines prior to the period of extended operation. The “parameters monitored or inspected” program element of the LRA AMP includes an enhancement (Commitment 9d in LRA Section A.4) to revise plant procedures to specify that inspections of sand pocket drain lines will monitor the internal condition of drain lines. The “detection of aging effects” program element of the LRA AMP includes an enhancement (Commitment 9e in LRA Section A.4) to revise plant procedures to require visual inspection of sand pocket drain lines to ensure there is no evidence of blockage.

Issue:

The staff needs additional information to determine that these enhancements are consistent with the recommendations for BWR Mark I steel containments in the “preventive actions” and “parameters monitored or inspected” program elements of the GALL Report AMP because: (1) it is not clear if the intent of the license renewal commitments is to revise plant procedures prior to the period of extended operation or to revise plant procedures and perform inspection of drain lines prior to the period of extended operation; (2) the proposed enhancements for license renewal, Commitments 9a and 9d, do not provide a stated objective for the inspection (i.e., to ensure that drain lines are clear or to monitor for water leakage or moisture in the drains or both); (3) the enhancements, license renewal Commitments 9a, 9d, and 9e, do not provide the associated frequency of inspections and the bases for its adequacy to meet the intended objective; and (4) it is not clear to the staff as to how the LRA AMP ensures that the refueling seal drains are clear.

Request:

1. Clarify if the intent of the enhancement for Commitments 9a, 9d, and 9e in LRA Section A.4 is to revise plant procedures prior to the period of extended operation or both, to revise plant procedures and perform inspection of drain lines prior to the period of extended operation.

2. Describe the objective(s) (i.e., to ensure that drain lines are clear or to monitor for water leakage or moisture in the drains or both); for the program enhancements listed as license renewal Commitments 9a and 9d in LRA Section A.4.

3. Provide the frequency of inspections associated with license renewal Commitments 9a, 9d, and 9e in LRA Section A.4 with the bases for the adequacies to accomplish the objective (i.e., to ensure that drain lines are clear or to monitor for water leakage or moisture in the drains or both); of the enhancements.

4. Clarify if the LRA AMP B.1.12 includes actions to ensure that the refueling seal drains are clear in order to prevent moisture levels associated with accelerated corrosion rates in the exterior portion of the drywell shell as recommended in the "preventive actions" and "parameters monitored and inspected" program elements of GALL Report AMP XI.S1. Otherwise, provide technical justification for the exception to the GALL Report recommendations.

5. Update the LRA and UFSAR supplement, as appropriate, to be consistent with the responses to the above requests.

RAI B.1.12-3

Background:

Section 54.21(a)(3) of 10 CFR requires that the applicant demonstrate that the effects of aging for structures and components will be adequately managed so that the intended function will be maintained consistent with the CLB for the period of extended operation. As described in the SRP-LR, an applicant may demonstrate compliance with 10 CFR 54.21(a)(3) by referencing the GALL Report and when evaluation of the matter in the GALL Report applies to the plant.

The "preventive action" program element of GALL Report AMP XI.S1 recommends that the program be augmented to include preventive actions that ensure that moisture levels associated with an accelerated corrosion rate do not exist in the exterior portion of the BWR Mark I steel containment drywell shell. The actions consist of ensuring that the sand pocket areas drains and/or the refueling seal drains are clear.

The "parameters monitored or inspected" program element of GALL Report AMP XI.S1 recommends that license renewal applicants with BWR Mark I steel containments should monitor the sand pocket area drains and/or the refueling seal drains for water leakage and also ensure the drains are clear.

LRA Section B.1.12 states that Fermi 2 primary containment is a General Electric Mark I pressure suppression steel containment consisting of a drywell, a torus, and a connecting vent system. LRA Section B.1.12, "Containment Inservice Inspection - IWE," states that the existing program, with enhancements, will be consistent with GALL Report AMP XI.S1.

To demonstrate consistency of the program elements in the LRA with that in the GALL Report for BWR Mark I containments, LRA Sections A.1.12 and B.1.12 include enhancements to program elements that will be implemented prior to the period of extended operation. The "preventive action" program element of the LRA AMP includes an enhancement (Commitment 9a in LRA Section A.4) to revise plant procedures to require inspection of the sand pocket drain lines prior to the period of extended operation. The "parameters monitored or inspected" program element of the LRA AMP includes an enhancement (Commitment 9d in LRA Section

A.4) to revise plant procedures to specify that inspections of sand pocket drain lines will monitor the internal condition of drain lines.

During the audit, from a review of Fermi 2 Surveillance Procedure 24.000.03, Revision 77 (including Attachments 1 and 2), the staff noted that this procedure included implementation of regulatory commitments made by letter NRC-88-0081, "Revised Response to GL 87-05," dated April 20, 1988, and tracked in the applicant's Regulatory Action Commitment Tracking System (RACTS) under RACTS 88027. These items require inspection of the reactor-drywell seal bellows and the four sand cushion drain lines for leakage during Mode 5 "Refueling" of every refueling outage. Accordingly, the procedure requires verification of the reactor-drywell seal bellows leakage on a daily basis for the first 3 days following reactor cavity flooding and at a frequency of 7 days following that with an acceptance criteria of no observed leakage. The procedure also requires verification of the drywell sand cushion leakage at a frequency of 7 days (with a note that the commitment is monthly but performance will be 7 days) following reactor cavity flooding with an acceptance criteria of no observed leakage. Checks for leakage are required at Azimuth 90/180/270/360 degrees, 6 inches below reactor pedestal catwalk between torus and drywell.

Issue:

The "preventive actions" program element of the LRA AMP basis document states on page 26 that:

> During refueling the refueling bellows drain empties into a manifold which is equipped with a sight glass. This sight glass is monitored when the refueling pool is flooded to detect potential leakage of water into the space around the drywell shell. The sand pocket drains are also being monitored for signs of moisture. Fermi 2 plans to re-inspect the drain lines to verify their condition prior to the period of extended operation ***to confirm that these preventative actions are not warranted*** [emphasis added by the staff]***.*** The program will be enhanced to require inspection of the sand pocket drain lines prior to the period of extended operation.

Further, the "parameters monitored or inspected" program element on page 28 of the program basis document states that: "Fermi 2 performs routine surveillances of the drains to record the observed condition of the drain lines for any leakage. Fermi 2 will inspect the sand pocket drain lines to verify their condition prior to the period of extended operation to confirm that the sand pocket drains are clear …."

Despite the above existing commitments controlled by Procedure 24.000.03 to periodically monitor the sand pocket cushion drain lines and reactor-drywell seal bellows for signs of water leakage into inaccessible areas of the drywell, it is not clear to the staff if the periodic monitoring of the sand cushion drain lines and refueling seal bellows for water leakage every refueling outage will continue into the period of extended operation because of the inconsistent and contradicting statement on page 26 of the LRA program basis document that is cited with ***added emphasis*** in the indented paragraph above. This statement appears to provide an indication that the periodic monitoring of sand cushion drain lines and refueling seal bellows may be discontinued. Therefore, the staff needs additional information to determine if the "parameters monitored or inspected" program element is consistent with GALL Report AMP XI.S1 with

regard to the recommendation for periodically monitoring the sand pocket area drains and the refueling seal drains for water leakage.

Request:

1. Confirm if the refueling seal bellows and the sand cushion drain lines of the Fermi 2 Mark I steel containment will continue to be monitored periodically every refueling outage for water leakage or signs of moisture, in accordance with Procedure 24.000.03, through the period of extended operation. If these will be monitored periodically through the period of extended operation, provide an explanation of the contradicting statement on page 26 of the LRA AMP basis document that “Fermi 2 plans to re-inspect the drain lines to verify their condition prior to the period of extended operation to confirm that these preventative actions are not warranted” in the context of demonstrating consistency with the “parameters monitored or inspected” program element of GALL Report AMP XI.S1.

2. If monitoring of the refueling seal bellows and the sand cushion drain lines for water leakage will not continue into the period of extended operation, as recommended in the “parameters monitored or inspected” program element of GALL Report AMP XI.S1, justify the adequacy of the proposed exception to manage the aging effects of corrosion in inaccessible areas of the drywell shell exterior.

3. Update the LRA and UFSAR supplement, as applicable, to be consistent with the responses to the above requests.

RAI B.1.12-4

Background:

Section 54.21(a)(3) of 10 CFR requires that the applicant demonstrate that the effects of aging for structures and components will be adequately managed so that the intended function will be maintained consistent with the CLB for the period of extended operation. As described in the SRP-LR, an applicant may demonstrate compliance with 10 CFR 54.21(a)(3) by referencing the GALL Report and when evaluation of the matter in the GALL Report applies to the plant.

The “monitoring and trending” program element in GALL Report AMP XI.S1 recommends that license renewal applicants for plants with a BWR Mark I containment develop a corrosion rate that can be inferred from past ultrasonic testing (UT) examinations or establish a corrosion rate using representative alternate means and provide a technical basis based on the developed or established corrosion rate that the drywell will have sufficient thickness to perform its intended function through the period of extended operation.

LRA Section B.1.12 states that Fermi 2 primary containment is a General Electric Mark I pressure suppression steel containment consisting of a drywell, a torus, and a connecting vent system. LRA Section B.1.12, "Containment Inservice Inspection - IWE," states that the existing program, with enhancements, will be consistent with GALL Report AMP XI.S1.

To establish consistency of the program element in the LRA with that in the GALL Report, LRA Sections A.1.12 and B.1.12 include an enhancement to the "monitoring and trending" program element that will be implemented prior to the period of extended operation. This enhancement (Commitment 9f in LRA Section A.4) states: "Revise plant procedures to determine drywell shell thickness in the sand pocket areas before the period of extended operation. From the results, develop a corrosion rate to demonstrate that the drywell shell will have sufficient thickness to perform its intended function through the period of extended operation." During the audit, the staff noted that, for technical reasons indicated in the letters NRC-87-005 and NRC-88-0081, dated September 10, 1987, and April 20, 1988, respectively, and summarized in LRA Section B.1.12, ultrasonic thickness measurements of the drywell shell sand pocket areas were not performed at Fermi 2 in response to Generic Letter (GL) 87-05.

Issue:

It is not clear to the staff if the statements above in the "monitoring and trending" program elements of the GALL Report AMP and LRA AMP are consistent because the proposed enhancement to the "monitoring and trending" program element in the LRA AMP does not indicate the minimum number of sets and interval at which UT measurements will be performed, and it does not provide the technical basis of how an appropriate corrosion rate will be developed if only one set of UT measurements is intended.

Request:

1. State the minimum number of sets of UT measurements and the interval at which they will be performed to determine the corrosion rate of the drywell shell sand pocket area. Also, explain the basis for the selected number of sets and interval for UT measurements of the drywell shell. Provide the technical basis that the drywell shell will have sufficient thickness to perform its intended function through the period of extended operation.

2. If only one set of UT measurements is intended in the response to Request 1, provide the technical basis of how an appropriate or conservatively-biased corrosion rate will be developed based on one set of UT measurements.

3. Update the LRA and UFSAR supplement, as applicable, to be consistent with the responses to the above requests.

RAI B.1.12-5

Background:

Section 54.21(a)(3) of 10 CFR requires that the applicant demonstrate that the effects of aging for structures and components will be adequately managed so that the intended function will be maintained consistent with the CLB for the period of extended operation. As described in the SRP-LR, an applicant may demonstrate compliance with 10 CFR 54.21(a)(3) by referencing the GALL Report and when evaluation of the matter in the GALL Report applies to the plant.

The “corrective actions” program element in GALL Report AMP XI.S1 recommends that:

> If moisture has been detected or suspected in the inaccessible areas on the exterior of the Mark I containment drywell shell or the source of moisture cannot be determined subsequent to root cause analysis, then:
>
> (a) Include in the scope of license renewal any components that are identified as a source moisture, if applicable, such as the refueling seal or cracks in the stainless liners of the refueling cavity pools walls, and perform aging management review.
>
> (b) Identify surfaces requiring examination by implementing augmented inspections for the period of extended operation in accordance with Subsection IWE-1240, as identified in Table IWE-2500-1, Examination Category E-C.
>
> (c) Use examination methods that are in accordance with Subsection IWE-2500.
>
> (d) Demonstrate, through use of augmented inspections performed in accordance with Subsection IWE, that corrosion is not occurring or that corrosion is progressing so slowly that the age-related degradation will not jeopardize the intended function of the drywell shell through the period of extended operation.

LRA Section B.1.12 states that the Fermi 2 primary containment is a General Electric Mark I pressure suppression steel containment consisting of a drywell, a torus, and a connecting vent system. LRA Section B.1.12, "Containment Inservice Inspection - IWE," states that the existing program, with enhancements, will be consistent with GALL Report AMP XI.S1.

LRA Sections A.1.12 and B.1.12 include an enhancement to the “corrective action” program element of the LRA AMP that will be implemented prior to the period of extended operation. This enhancement (Commitment 9g in LRA Section A.4) commits to revise plant procedures to require three specific corrective actions should moisture be detected or suspected in the inaccessible areas on the exterior of the Mark I steel containment drywell shell. These specific actions included in the above enhancement to the LRA AMP correspond to recommended actions (b), (c), and (d) (as listed above) in the “corrective actions” program element of GALL Report AMP XI.S1 if moisture has been detected in the inaccessible areas on the exterior of the Mark I containment drywell shell or the source of moisture cannot be determined subsequent to root cause analysis. However, the LRA AMP program basis document and corresponding enhancement did not address action (a) of GALL Report AMP XI.S1 which recommends including any components that are identified as a source of moisture, if applicable, within the scope of license renewal and performing an aging management review.

Issue:

It is not clear to the staff that the “corrective actions” program element of the LRA AMP is consistent with recommended actions in the GALL Report AMP. Specifically, if moisture is detected or suspected in inaccessible areas of the drywell shell exterior of Mark I containments, the LRA AMP basis document did not identify the components that are potential sources of moisture to inaccessible areas of the drywell exterior and whether they were subjected to AMR.

Request:

1. With regard to the enhancement in the “corrective action” program element of the LRA AMP B.1.12, clarify if components that are sources of moisture to inaccessible areas of the Mark I containment drywell shell exterior have been identified and subjected to an AMR, as recommended in item (a) of the corresponding element in GALL Report AMP XI.S1. List the components that have been identified as potential sources of moisture to inaccessible areas of the drywell exterior and have been subjected to an AMR.

2. Otherwise, justify the adequacy of the proposed exception to manage the aging effects of corrosion due to moisture intrusion in inaccessible areas of the drywell shell exterior.

3. Update the LRA and UFSAR supplement, as applicable, to be consistent with the responses to the above requests.