



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

December 19, 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 11 (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 January 21, 2015. However, the applicant requested 35 additional days (February 25, 2015) to provide the response for request for additional information B.1.22-1. The staff agreed with this request. 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: See next page

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**FERMI 2
LICENSE RENEWAL APPLICATION
REQUESTS FOR ADDITIONAL INFORMATION SET 11
(TAC NO. MF4222)**

RAI B.1.2-1

Background:

Generic Aging Lessons Learned (GALL) Report aging management program (AMP) XI.M18 “parameters monitored or inspected” program element recommends that “bolting for safety-related pressure retaining components [be] inspected for leakage, loss of material, cracking, and loss/of preload [...]. Bolting for other pressure retaining components is inspected for signs of leakage.” GALL Report AMP XI.M18 “detection of aging effects” program element recommends that periodic inspections of pressure-retaining closure bolting be performed at least once per refueling cycle for signs of leakage to ensure the detection of age-related degradation due to loss of material and loss of preload.

License Renewal Application (LRA) Section B.1.2 states that the Bolting Integrity Program is an existing AMP, with enhancements, that will be consistent with GALL Report AMP XI.M18.

Issue:

LRA Section B.1.2 states that the “Bolting Integrity Program manages loss of preload, cracking, and loss of material for accessible [emphasis added] closure bolting for safety-related and non-safety-related pressure components.” It is not clear how the effects of aging on inaccessible pressure-retaining closure bolting within the scope of license renewal will be managed consistent with the recommendations in GALL Report AMP XI.M18. In addition, if inaccessible bolting is not managed consistent with the recommendations in GALL report AMP XI.M18, the staff needs additional information regarding how inaccessible bolting will be age managed and under what conditions the applicant considers bolting to be inaccessible. The staff needs this information to determine whether the program is adequate to manage aging of these components.

Request:

- (1) State whether the program will manage the aging effects for inaccessible pressure-retaining closure bolting consistent with the recommendations in GALL Report AMP XI.M18.
- (2) If inaccessible bolting will not be managed consistent with the recommendations in GALL Report AMP XI.M18:
 - a. Explain what is considered inaccessible closure bolting at Fermi 2.
 - b. Explain how the effects of aging on inaccessible closure bolting within the scope of license renewal will be adequately managed such that their intended functions will be maintained for the period of extended operation.

ENCLOSURE

RAI B.1.2-2

Background:

GALL Report AMP XI.M18 provides recommendations to manage loss of material and loss of preload of pressure-retaining closure bolting. GALL Report AMP XI.M18 includes preventive measures to minimize loss of preload, such as proper torqueing of bolts and checking for uniformity of gasket compression. GALL Report AMP XI.M18 also recommends periodic inspections (at least once per refueling cycle) of closure bolting for signs of leakage to ensure the detection of age-related degradation due to loss of material and loss of preload.

LRA Section B.1.2 states that the Bolting Integrity Program is an existing program, with enhancements, that will be consistent with GALL Report AMP XI.M18. LRA Section B.1.2 describes an enhancement to the Bolting Integrity Program to revise the procedures to inspect the residual heat removal service water (RHRSW), emergency equipment service water (EESW), and emergency diesel generator service water (EDGSW) systems pump and valve bolting submerged in the RHRSW reservoir at least once per refueling outage.

Issue:

During its onsite review of the program basis documents, the staff noted that the applicant's program lacked information regarding how the inspections will detect the applicable aging effects. It is not clear how the submerged closure bolting will be inspected such that loss of material and loss of preload can be detected prior to loss of intended function. Given the fact that a submerged environment limits the ability to detect leakage of submerged bolted connections, it is not clear how the program will detect loss of material and loss of preload for submerged bolted connections.

Request:

For the submerged bolting in the RHRSW, EESW, and EDGSW systems and other submerged closure bolting within the scope of license renewal, describe how the program will detect both loss of material and loss of preload. Also, describe how the proposed bolting inspections will detect loss of material in crevice locations (e.g., threaded regions or the shank below the bolt heads) that are not readily visible.

RAI B.1.2-3

Background:

GALL Report AMPs XI.M18 and XI.S3 state that molybdenum disulfide (MoS₂) should not be used as a lubricant due to its potential contribution to stress corrosion cracking (SCC), especially for high-strength bolts (actual yield strength greater than or equal to 150 ksi). GALL Report AMP XI.S6, states that preventive actions emphasize proper selection of lubricants to prevent or minimize cracking of high-strength bolting. The GALL Report also states that the applicant is to evaluate applicable operating experience to support the conclusion that the effects of aging are adequately managed.

LRA Sections B.1.2, B.1.22, and B.1.42 state that the Bolting Integrity, Inservice Inspection - IWF, and Structures Monitoring Programs are existing AMPs, with enhancements and an exception, that will be consistent with GALL Report AMPs XI.M18, XI.S3, and XI.S6.

Issue:

LRA Sections B.1.2 and B.1.22 state that “[p]lant procedures prohibit the use of lubricants containing molybdenum disulfide [MoS₂].” The staff also noted that the LRA AMP basis document for the Structures Monitoring Program states that plant procedures prevent the use of MoS₂ as a lubricant for bolting. During its onsite audit, the staff confirmed that the bolting procedures had been revised to prohibit the use of MoS₂, however, it is not clear whether MoS₂ lubricants have been used at Fermi 2 before plant procedures were revised to prohibit their use.

Request:

State whether MoS₂ lubricants have been used on any high-strength closure bolts or any high-strength structural bolts in sizes greater than 1 inch nominal diameter, within the scope of the Bolting Integrity, Inservice Inspection - IWF, and Structures Monitoring Programs. If these lubricants have been used on high-strength bolts in the past, explain how the affected bolts will be managed for age-related degradation during the period of extended operation.

RAI B.1.22-1

Background:

The LRA states that the Inservice Inspection - IWF Program, with enhancements, is consistent with GALL Report AMP XI.S3, “ASME Section XI, Subsection IWF.” The “detection of aging effects” program element in GALL Report AMP XI.S3 recommends that, for high-strength structural bolting (actual measured yield strength greater than or equal to 150 ksi) in sizes greater than 1 inch nominal diameter, volumetric examinations should be performed in addition to VT-3 to detect cracking. The GALL Report AMP XI.S3 has the following recommendations for aging management of high-strength structural bolting:

- The “scope of program” program element states that the scope of the program includes high-strength structural bolting.
- The “preventive actions” program element recommends using bolting material that has an actual measured yield strength that is less than 150 ksi.
- The “parameters monitored or inspected” program element recommends that high-strength structural bolting susceptible to SCC be monitored for cracking.
- The “detection of aging effects” program element states that the volumetric examination may be waived with adequate plant-specific justification.

Issue:

LRA Section B.1.22, "Inservice Inspection - IWF," includes enhancements to revise plant procedures to identify unacceptable conditions such as "cracked or sheared bolts, including high-strength bolts." However, it is not clear whether there are high-strength structural bolts (actual measured yield strength greater than or equal to 150 ksi) in sizes greater than 1 inch nominal diameter within the scope of the Inservice Inspection - IWF Program. In addition, it is not clear how the applicant plans to manage aging for these components consistent with GALL Report AMP XI.S3 recommendations in the "preventive actions" and "parameters monitored or inspected" program elements described above.

The LRA also states that "[p]lant procedures prohibit the use of lubricants containing molybdenum disulfide. Since the use of this type of lubricant is prohibited in plant procedures and plant procedures provide the technical guidance for installation requirements [...], the potential for [SCC] for high-strength structural bolting material, i.e., ASTM A325 and A490, is not plausible." Given that the use of molybdenum disulfide is not the only contributor to SCC of high-strength bolts; the staff has not determined that there is sufficient basis to conclude that SCC is not a credible aging effect for high-strength structural bolting (actual measured yield strength greater than or equal to 150 ksi) in sizes greater than 1 inch diameter. If there are high-strength structural bolts (actual measured yield strength greater than or equal to 150 ksi) in sizes greater than 1 inch diameter within the scope of license renewal, the staff needs additional information regarding the environments to which these bolts are exposed to evaluate the applicant's claim that there is no potential for SCC.

Request:

- (1) State whether or not there are high-strength structural bolts (actual measured yield strength greater than or equal to 150 ksi) in sizes greater than 1 inch diameter within the scope of the Inservice Inspection - IWF Program.
- (2) If high-strength structural bolts (actual measured yield strength greater than or equal to 150 ksi) in sizes greater than 1 inch diameter are within the scope of the Inservice Inspection - IWF Program, state how the recommendations will be implemented for the Inservice Inspection - IWF Program:
 - (a) Provide additional information regarding the environments to which bolts are exposed.
 - (b) State whether the recommendations for managing degradation of high-strength bolts described in the "preventive actions" and "parameters monitored or inspected" of the GALL Report AMP XI.S3 will be implemented for the Inservice Inspection - IWF Program.

RAI B.1.22-2

Background:

The LRA states that the Inservice Inspection - IWF Program, with enhancements, is consistent with GALL Report AMP XI.S3, "ASME Section XI, Subsection IWF." GALL Report AMP XI.S3, "ASME Section XI, Subsection IWF," states that the ASME Code, Section XI, Subsection IWF, constitutes an existing mandated program applicable to managing aging of ASME Class 1, 2, 3 and metal containment (MC) component supports. The "monitoring and trending" program element, states that examinations of Class 1, 2, 3, and MC component supports and related hardware (i.e., structural bolting, high strength structural bolting, support anchorage to the building structure, accessible sliding surfaces, constant and variable load spring hangers, guides, stops, and vibration isolation elements) that reveal unacceptable conditions which exceed the acceptance criteria and require corrective measures are extended to include additional examinations in accordance with ASME Code Section XI, Subsection IWF-2430. The ASME Code Section XI, Subsection IWF, states that to the extent practical, the same supports selected for examination during the first inspection interval shall be examined during each successive inspection interval.

The staff noted that there is recent industry operating experience in which degraded conditions were found during ASME Code, Section XI, Subsection IWF, examinations of Class 1, 2, 3, and MC component supports and related hardware. Engineering evaluation determined that the as-found component/hardware was acceptable-as-is, but the component/hardware was still re-worked to as-new condition. Since it was determined that the as-found condition did not affect the support's capability to perform its design function or exceed the threshold of IWF-3400 acceptance criteria, the licensee did not apply ASME Code, Sections IWF-2420 and IWF-2430 for successive or additional examinations.

Issue:

The staff's concern with respect to aging management is that if ASME Code, Section XI, Subsection IWF supports that are part of the inspection sample are reworked to as-new condition, they are no longer typical of the other supports in the population. Subsequent ASME Code, Section XI, Subsection IWF, inspections of the same sample would not represent the age related degradation of the rest of the population. The applicant's LRA and associated basis documents provide no discussion of how this issue would be addressed, or if the IWF sample would be changed or expanded if a support within the original sample was reworked.

Request:

For situations in which corrective actions are not required per the ASME Code, Section XI, Subsection IWF, acceptance criteria but a component in the IWF sample is re-worked such that it no longer represents age-related degradation of the entire population, describe how the Inservice Inspection - IWF Program will continue to be effective in managing aging of similar/adjacent components that are not included in the IWF inspection sample.

RAI 2.5-1

Background:

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 54.4(a)(3) requires that all SSCs relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with the U.S. Nuclear Regulatory Commission regulations for station blackout (10 CFR 50.63) be included within the scope of license renewal.

Fermi 2 (LRA), Section 2.1.1.3.5, "Commission's Regulations for Station Blackout (10 CFR 50.63)," states that "plant electrical and [instrumentation and control] systems are included in the scope of license renewal by default. Consequently, electrical equipment that supports the requirements of 10 CFR 50.63 is included in the scope of the license renewal." Section 2.1.1.3.5 also states that, "[t]he individual scoping evaluations in Section 2.4 contain the results of the review for the Fermi 2 structures."

LRA Section 2.3.3.9, "Combustion Turbine Generator," states that the combustion turbine generator (CTG) system is used as an alternate source of power for station blackout (SBO) and for safe shutdown and perform a function that demonstrates compliance with the Commission's regulations for SBO (10 CFR 50.63). LRA Table 2.2-4, "Structures Within the Scope of License Renewal," lists CTG No. 11-1 Unit as a structure within the scope of the license renewal.

Issue:

LRA Table 2.3.3-9, "Combustion Turbine Generator System Components Subject to Aging Management Review," does not list any electrical systems or components that are subject to an aging management review (AMR). The electrical systems and components associated with the CTG No. 11-1 Unit are not mentioned in LRA Section 2.5, "Scoping and Screening Results: Electrical and Instrumentation and Controls Systems," and Section 3.6, "Electrical and Instrumentation and Control Systems." In addition, Table 2.5-1, "Electrical and Instrumentation and Control Systems Components Subject to Aging Management Review," does not list CTG No. 11-1 Unit electrical components as part of the AMR.

Request:

The staff requests that the applicant verify whether the CTG No. 11-1 Unit system electrical components are within the scope of license renewal in accordance with 10 CFR 54.4(a)(3) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If the CTG system electrical components are not within the scope of license renewal and not subject to an AMR, please provide justification for the exclusion.