Vito A. Kaminskas
Site Vice President

DTE Energy Company
6400 N. Dixie Highway, Newport, MI 48166
Tel: 734.586.6515 Fax: 734.586.4172
Email: kaminskasv@dteenergy.com

DTE Energy

10 CFR 54

June 9, 2015
NRC-15-0062

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington D C 20555-0001

References: 1) Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

2) DTE Electric Company Letter to NRC, "Fermi 2 License Renewal Application," NRC-14-0028, dated April 24, 2014 (ML14121A554)

3) NRC Letter, "Requests for Additional Information for the Review of the Fermi 2 License Renewal Application – Set 34 (TAC No. MF4222)," dated May 15, 2015 (ML15126A004)

4) DTE Electric Company Letter to NRC, "Response to NRC Request for Additional Information for the Review of the Fermi 2 License Renewal Application – Sets 27, 28, 29, 31," NRC-15-0044, dated April 27, 2015 (ML15118A557)

Subject: Response to NRC Request for Additional Information for the Review of the Fermi 2 License Renewal Application – Set 34

In Reference 2, DTE Electric Company (DTE) submitted the License Renewal Application (LRA) for Fermi 2. In Reference 3, NRC staff requested additional information regarding the Fermi 2 LRA. Enclosure 1 to this letter provides the DTE response to the request for additional information (RAI). Enclosure 2 to this letter provides a revised response to Set 27 RAI B.1.45-2 as discussed with the NRC during clarification calls on April 29 and May 4, 2015. The response to RAI B.1.45-2 was previously submitted in Reference 4.

One new commitment is being made in this submittal. The new commitment is in LRA Table A.4 Item 7, BWR Vessel Internals Program, as indicated in the response to RAI B.1.10-3 in Enclosure 1.

Should you have any questions or require additional information, please contact Lynne Goodman at 734-586-1205.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on June 9, 2015

Vito A. Kaminskas
Site Vice President
Nuclear Generation

Enclosures:
1) DTE Response to NRC Request for Additional Information for the Review of the Fermi 2 License Renewal Application – Set 34
2) DTE Revised Response to NRC Request for Additional Information for the Review of the Fermi 2 License Renewal Application – Set 27 Question B.1.45-2

cc: NRC Project Manager
NRC License Renewal Project Manager
NRC Resident Office
Reactor Projects Chief, Branch 5, Region III
Regional Administrator, Region III
Michigan Public Service Commission,
Regulated Energy Division (kindschl@michigan.gov)

Enclosure 1 to
NRC-15-0062

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

DTE Response to NRC Request for Additional Information for the Review of the Fermi 2 License Renewal Application – Set 34

Set 34 RAI B.1.10-3

Background

By letter dated February 5, 2015, the applicant provided its response to request for additional information (RAI) 4.1-3. In this letter, the applicant stated that it implements inspections of the top guide assembly and its components in accordance with Technical Report Boiling Water Reactor Vessel and Internals Project (BWRVIP)-183.

Issue

As of April 22, 2015, the staff has yet to issue formal endorsement of the BWRVIP-183 report. Although the staff did issue its draft final safety evaluation report (draft FSER) for the BWRVIP-183 report to the Electric Power Research Institute (EPRI) BWRVIP main committee on December 13, 2011—to provide an opportunity to identify any proprietary information and clarify any factual inaccuracies—the staff has yet to receive any feedback from the EPRI BWRVIP main committee on the draft FSER. However, in the draft FSER, the staff imposed three (3) conditions for those BWR license renewal applicants that will be implementing the BWRVIP-183 report during the period of extended operation.

The staff needs clarification on how the applicant plans to address the objectives (e.g., inspection, flaw evaluation, repair criteria, etc.) of the BWR Vessel Internals Program for specific inspection and evaluation (I&E) activities of the top guide assembly and its components.

Request

(1) Clarify and justify which BWR Vessel Internals Program objectives (e.g., inspection, flaw evaluation, repair criteria, etc.) the applicant will accomplish using the BWRVIP-183 report when applying the report to specific I&E activities of the top guide assembly and its components.

(2) If the report will be used for flaw evaluations of the top guide assembly and its components, clarify how the flaw evaluation methodology will account for the following factors that may impact the flaw evaluation basis:

a. stress loads for potential flaws detected near component discontinuities
b. conservative flaw growth assumptions in the methodology
c. potential for and impact of severed beam locations if flaw growth assumptions in the flaw evaluation methodology are determined to be non-conservative for the top guide beam locations

(3) Update the license renewal application (LRA) and any additional enhancements to Aging Management Program (AMP) B.1.10, as appropriate.

Response:

1) DTE will use BWRVIP-183 for inspection and flaw evaluation of the top guide grid beams as part of the BWR Vessel Internals Program in LRA Section B.1.10. BWRVIP-183 is one of the recommended guidelines in NUREG-1801 Rev. 2 for top guide inspection and evaluation. The draft final safety evaluation report (draft FSER) discussed in the issue section of this RAI did not identify any concerns with the inspection guidelines in BWRVIP-183. The three conditions in the draft FSER are related to flaw evaluation and will be addressed by DTE as discussed in the response to request 2 below.

2) As stated in response to request 1 above, BWRVIP-183 will be used for flaw evaluation of the top guide grid beams. DTE flaw evaluation methodology will address the three conditions in the draft FSER and account for factors that may impact the flaw evaluation basis as follows:

   a. Detected flaws evaluated using the methodology in BWRVIP-183 Section 4 will be demonstrated to be sufficiently far from geometric discontinuities (i.e. notches or slots) such that the stress condition in the vicinity of the flaw is consistent with that for a single edge-crack plate. Appropriately applied K values which account for the effects of geometric discontinuities will be used and justified in the flaw evaluation.
   b. The flaw evaluation methodology in BWRVIP-183 Section 4 will be used to justify continued operation on a cycle-by-cycle basis. Use of the flaw evaluation methodology to justify operation for more than one cycle will require NRC approval and would be based on plant-specific operating experience including crack length measurements of detected top guide grid beam flaws to benchmark the accuracy of the flaw evaluation methodology.
   c. When applying the flaw evaluation methodology in BWRVIP-183 Section 4, a severed beam evaluation consistent with BWRVIP-183 Section 5 will also be performed. The severed beam analysis will demonstrate that even if a beam was completely severed, it would not be expected to interfere with the ability of the control rod drive system to insert control rods.

   While BWRVIP-183 is referenced in NUREG-1801 as an element of an approved aging management program, the NRC has not yet formally approved BWRVIP-183. If a resolution of the three conditions contained in the draft FSER is reached during the NRC review and approval process of BWRVIP-183, DTE reserves the right to utilize the resulting generic flaw evaluation methodology. In that case, DTE would use the appropriate change process (i.e. an LRA change if the license has not yet been renewed or the 10 CFR 50.59 process if the license has already been renewed) to modify the methodology accordingly.

3) The BWR Vessel Internals Program will be enhanced to indicate how the flaw evaluation methodology will account for factors that may impact the flaw evaluation basis as described in the response to request 2 above. LRA Sections A.1.10, A.4, and B.1.10 will be revised to add the enhancement to the BWR Vessel Internals Program.

LRA Revisions:

LRA Sections A.1.10, A.4, and B.1.10 are revised as shown on the following pages. Additions are shown in underline and deletions are shown in strike-through. Note that previous changes to these same LRA sections made in the April 27, 2015 letter (NRC-15-0044) are not shown in underline or strike-through such that only the new changes due to RAI B.1.10-3 are shown as revisions.

A.1.10 BWR Vessel Internals Program

The BWR Vessel Internals Program will be enhanced as follows.

- Revise BWR Vessel Internals Program procedures such that the flaw evaluation methodology for the top guide grid beam will address the following three items if they have not been resolved generically during the NRC review and approval process of BWRVIP-183:
  (1) Detected flaws evaluated using the methodology in BWRVIP-183 Section 4 will be demonstrated to be sufficiently far from geometric discontinuities (i.e. notches or slots) such that the stress condition in the vicinity of the flaw is consistent with that for a single edge-crack plate. Appropriately applied K values which account for the effects of geometric discontinuities will be used and justified in the flaw evaluation.
  (2) The flaw evaluation methodology in BWRVIP-183 Section 4 will be used to justify continued operation on a cycle-by-cycle basis. Use of the flaw evaluation methodology to justify operation for more than once cycle will require NRC approval and would be based on plant-specific operating experience including crack length measurements of detected top guide grid beam flaws to benchmark the accuracy of the flaw evaluation methodology.
  (3) When applying the flaw evaluation methodology in BWRVIP-183 Section 4, a severed beam evaluation consistent with BWRVIP-183 Section 5 will also be performed. The severed beam analysis will demonstrate that even if a beam was completely severed beam, it would not be expected to interfere with the ability of the control rod drive system to insert control rods.

Enhancements will be implemented prior to the period of extended operation.

A.4 LICENSE RENEWAL COMMITMENT LIST

No.	Program or Activity	Commitment	Implementation Schedule	Source
7	BWR Vessel Internals	Enhance BWR Vessel Internals Program as follows: d. Revise BWR Vessel Internals Program procedures such that the flaw evaluation methodology for the top guide grid beam will address the following three items if they have not been resolved generically during the NRC review and approval process of BWRVIP-183: (1) Detected flaws evaluated using the methodology in BWRVIP-183 Section 4 will be demonstrated to be sufficiently far from geometric discontinuities (i.e. notches or slots) such that the stress condition in the vicinity of the flaw is consistent with that for a single edge-crack plate. Appropriately applied K values which account for the effects of geometric discontinuities will be used and justified in the flaw evaluation. (2) The flaw evaluation methodology in BWRVIP-183 Section 4 will be used to justify continued operation on a cycle-by-cycle basis. Use of the flaw evaluation methodology to justify operation for more than once cycle will require NRC approval and would be based on plant-specific operating experience including crack length measurements of detected top guide grid beam flaws to benchmark the accuracy of the flaw evaluation methodology. (3) When applying the flaw evaluation methodology in BWRVIP-183 Section 4, a severed beam evaluation consistent with BWRVIP-183 Section 5 will also be performed. The severed beam analysis will demonstrate that even if a beam was completely severed beam, it would not be expected to interfere with the ability of the control rod drive system to insert control rods.	Perform initial inspection either prior to March 20, 2025 or before March 20, 2030. Submit analysis and inspection plan to NRC prior to March 20, 2023. Remaining activities: Prior to September 20, 2024, or the end of the last refueling outage prior to March 20, 2025, whichever is later.	A.1.10

B.1.10 BWR VESSEL INTERNALS

Enhancements

The following enhancements will be implemented prior to the period of extended operation.

Element Affected	Enhancement
4. Detection of Aging Effects 7. Corrective Actions	Revise BWR Vessel Internals Program procedures such that the flaw evaluation methodology for the top guide grid beam will address the following three items if they have not been resolved generically during the NRC review and approval process of BWRVIP-183: (1) Detected flaws evaluated using the methodology in BWRVIP-183 Section 4 will be demonstrated to be sufficiently far from geometric discontinuities (i.e. notches or slots) such that the stress condition in the vicinity of the flaw is consistent with that for a single edge-crack plate. Appropriately applied K values which account for the effects of geometric discontinuities will be used and justified in the flaw evaluation. (2) The flaw evaluation methodology in BWRVIP-183 Section 4 will be used to justify continued operation on a cycle-by-cycle basis. Use of the flaw evaluation methodology to justify operation for more than once cycle will require NRC approval and would be based on plant-specific operating experience including crack length measurements of detected top guide grid beam flaws to benchmark the accuracy of the flaw evaluation methodology. (3) When applying the flaw evaluation methodology in BWRVIP-183 Section 4, a severed beam evaluation consistent with BWRVIP-183 Section 5 will also be performed. The severed beam analysis will demonstrate that even if a beam was completely severed, it would not be expected to interfere with the ability of the control rod drive system to insert control rods.

Enclosure 2 to
NRC-15-0062

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

DTE Revised Response to NRC Request for Additional Information for the Review of the Fermi 2 License Renewal Application – Set 27 Question B.1.45-2

Set 27 RAI B.1.45-2

Background

As amended by letter dated February 5, 2015, LRA Section B.1.45 states exceptions to the "corrective actions" program element. The exceptions state that when delamination, peeling, or blistering is detected during coating inspections and the coatings will be returned to service, physical testing will consist of lightly tapping the coating, light hand scraping, light power tool cleaning, or adhesion testing. The exception also states that destructive adhesion testing will not be conducted. The exception further states that longer followup and re-inspection inspection intervals than those recommended in Aging Management Program (AMP) XI.M42, "Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks," would be allowed as long as they were technically justified.

Issue

The "corrective actions" program element of AMP XI.M42 recommends that where adhesion testing is not possible due to physical constraints alternative means of physical testing such as those described by the applicant would be acceptable. However, the exception does not limit these alternative methods to instances where adhesion testing is not possible. There are nondestructive adhesion tests which can be conducted; therefore, the justification for the exception is not sufficient because it is based on the conclusion that coatings would be removed down to the base metal if adhesion testing is conducted. In addition, no basis was provided for inspection intervals beyond those recommended in the "~~acceptance criteria~~ corrective actions" program element of AMP XI.M42, beyond stating that a future evaluation would be conducted. [Per discussion with NRC on 4/7/15, the RAI should read as shown in strike-through/underline.]

Request

State: (a) why nondestructive adhesion testing cannot be performed when coatings are returned to service with delamination, peeling or blisters; (b) how lightly tapping the coating, light hand scraping, light power tool cleaning will be controlled (e.g., procedures, method qualification) such that consistent results can be obtained if nondestructive adhesion testing will not be performed; and (c) the basis and justification for any inspection intervals beyond those in the "~~acceptance criteria~~ corrective actions" program element of AMP XI.M42. [Per discussion with NRC on 4/7/15, the RAI should read as shown in strike-through/underline.]

Response:

DTE previously responded to RAI B.1.45-2 by letter dated April 27, 2015 (NRC-15-0044). The response to RAI B.1.45-2 is revised to include additional information requested by the NRC on clarification calls held on April 29 and May 4, 2015. The revised response below supersedes the response previously provided on April 27, 2015.

a) The corrective actions element of AMP XI.M42, as provided in LR-ISG-2013-01, states that coatings exhibiting peeling and delamination may be returned to service without being repaired, replaced, or removed under certain conditions which include adhesion testing per RG 1.54. Some of the adhesion testing methods in RG 1.54 are destructive in nature while others may be considered nondestructive. DTE does not intend to use destructive adhesion testing. However, even the nondestructive adhesion testing methods have the potential to be destructive. For example, the use of ASTM test standard D4541 "Pull-Off Strength of Coatings Using Portable Adhesion Testers" requires the attachment of a test fixture to the coating using adhesive. If the subject coating passes the prescribed load test then the test fixture must be removed without damaging the coating. This is usually performed by shearing the test fixture off with a sharp blow from a hammer. This test fixture removal method may damage the coating even after a passed test. Since even the nondestructive adhesion testing methods may be destructive, they will be performed with clarifications and exceptions as follows:

- The corrective actions element of AMP XI.M42, states that where adhesion testing is not possible due to physical constraints, another means of determining that the remaining coating/lining is tightly bonded to the base metal may be used. Although this discussion of physical constraints occurs in the context of blisters, it would also be applicable in the case of peeling and delamination. Therefore, DTE will not perform adhesion testing for peeling and delamination where not possible due to physical constraints.
- Adhesion testing will be applied in the case of peeling and delamination that has progressed to the base metal (excluding situations where not possible due to physical constraints as described above) as the coating has already been damaged and a potentially destructive adhesion test will have little impact to the overall damaged area.
- Adhesion testing will be applied in the case of peeling and delamination that has <u>not</u> progressed to the base metal unless both of the following conditions apply: 1) the peeling and delamination is occurring in a tank, pipe, or piping component with laminar or no flow conditions and 2) the scope of interrogation is expanded beyond the damaged area with large margins to ensure that all loose coatings have been removed. If the two conditions apply, then other methods of physical testing may be performed such as those discussed in the response to part b below. This exception will also apply to blisters not repaired.

The exceptions to the corrective actions element in LRA Section B.1.45 will be revised consistent with this response.

b) In the event that a nondestructive adhesion test method cannot be applied due to physical constraints (or is not applied per the other exceptions discussed above), other methods of determining that the coating is suitable to return to service such as light tapping, light hand scraping, or light power tool cleaning will be used. These other methods will be incorporated into site procedures that shall conform to the provisions of applicable Society of Protective

Coatings (SSPC) standards (e.g., SSPC-SP 2 Hand Tool Cleaning, SSPC-SP 3 Power Tool Cleaning, SSPC-SP 11 Power Tool Cleaning to Bare Metal, and Waterjet Cleaning SSPC-SP WJ-1,2,3, and 4). Per SSPC-SP 2 and SSPC-SP 3 these cleaning methods "remove all loose mill scale, loose rust, loose paint, and other loose detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Mill scale, rust, and paint are considered adherent if they cannot be removed by lifting with a dull putty knife." Additionally, tap testing will be utilized. Although there is not an SSPC standard for tap testing, guidance is provided on this method in the EPRI Comprehensive Coatings Training Course. The EPRI Comprehensive Coatings Training Course will be incorporated into site training and qualification requirements for a Coating Specialist. Further, the tap testing guidance contained in the training course will be incorporated into site procedures.

c) Inspection intervals will be in accordance with the "corrective actions" program element of AMP XI.M42 such that follow-up visual inspections of coatings returned to service that do not meet acceptance criteria will be conducted within two years from detection of the degraded condition, with a re-inspection within an additional two years, and continuing at least once every two years until the degraded coating is repaired or replaced. Therefore, the associated portion of Exception 3 will be removed from LRA Section B.1.45.

In addition, DTE will exclude the mechanical draft cooling tower (MDCT) spray header assemblies from the Coatings Integrity Program (LRA Section B.1.45). The MDCT spray header assemblies consist of galvanized piping that distributes service water from plant safety-related cooling systems to a series of spray nozzles. As shown on LRA drawings LRA-M-N-2052 and LRA-M-N-2053, service water returns from the Emergency Diesel Generator (EDG), the Residual Heat Removal (RHR), and the Emergency Equipment Service Water (EESW) systems merge into a common header in their respective divisional RHR Complex Pump Rooms. In each division, water is then directed either to the cold weather bypass or to one or both of the two MDCT cells. The return flow piping directed to the MDCTs penetrates a wall that separates the two areas (i.e., the RHR Complex Pump Rooms and the MDCT spray areas). Service water piping on the pump room side of the wall is carbon steel. Once through the wall the carbon steel transitions to galvanized piping so that all the galvanized piping is on the spray area side of the wall. All equipment in the pump rooms would be fully protected (i.e. separated by the wall) from any spray resulting from a failure of the galvanized piping. The spray areas are open to the environment (i.e. they are considered outdoors).

The Division 1 and 2 MDCTs consist of four cells, two in each division. The Service Water Integrity Program (LRA Section B.1.41) manages the effects of aging on the piping and spray nozzles. Preventive Maintenance (PM) events are in place to visually inspect and flow test each cell. All four cells are tested and inspected and the frequency is such that at least one cell inspection is scheduled each refuel cycle. The PM events require inspection of spray patterns to ensure no blockage. Spray nozzles that are found restricted or damaged during flow testing are cleaned out or replaced. Piping is replaced if cleaning is not practical. Results of the inspection are documented in the associated work package.

Furthermore, a one-time inspection of the galvanized spray piping will be conducted in accordance with the One-Time Inspection Program (LRA Section B.1.33). Each ultrasonic test (UT) inspection will consist of twenty-five locations. The sample locations will be selected based on risk of material loss. A total of 25 one-foot long locations of this material/environment combination will be examined. The GALL typically recommends a sample size of 25 for a given material/environment combination. This one-time inspection is expected to confirm that loss of base material indicative of loss of coating integrity is not occurring or is occurring so slowly that the aging effect will not affect the component intended function during the period of extended operation. Acceptance criteria will be similar to guidance provided in ISG-2012-02. A reduction in wall thickness greater than 50% will be an unacceptable result. Such a condition will be entered into the Fermi 2 Corrective Action Program. If greater than 10% of the sample locations are unacceptable, then future inspections would be conducted under the Periodic Surveillance and Preventive Maintenance (PSPM) Program (LRA Section B.1.35). A representative sample would be inspected every 5 years per the PSPM Program.

Therefore, Service Water Integrity Program and One-Time Inspection Program activities will detect and address loss of piping base material and downstream effects in the spray nozzles indicative of loss of coating integrity without the need for visual inspections conducted under the Coatings Integrity Program. LRA Section B.1.33 and LRA Table 3.3.2-3 will be revised consistent with this response.

LRA Revisions:

LRA Sections A.1.33, A.1.45, B.1.33, and B.1.45 and LRA Table 3.3.2-3 (and associated plant-specific note) are revised as shown below. Additions are shown in underline and deletions are shown in strike-through. Note that previous changes to these same LRA sections made in the February 5, 2015 letter (NRC-15-0021) are not shown in underline or strike-through such that only the new changes due to RAI B.1.45-2 are shown as revisions.

Table 3.3.2-3
Service Water Systems
Summary of Aging Management Evaluation

Table 3.3.2-3: Service Water Systems								
Component Type	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Program**	**NUREG-1801 Item**	**Table 1 Item**	**Notes**
Piping	Pressure boundary	Carbon steel	Raw water (int)	Loss of coating integrity	~~Coating Integrity~~ Service Water Integrity	--	--	H, 312

Notes for Table 3.3.2-1 through 3.3.2-17-36

Plant-Specific Notes

312. The One-Time Inspection Program will supplement the Service Water Integrity Program for the galvanized piping in the mechanical draft cooling tower spray assemblies.

A.1.33 One-Time Inspection Program

The program will include activities to verify effectiveness of aging management programs and activities to confirm the insignificance of aging effects as described below.

A representative sample of internal and external surfaces of reactor core isolation cooling (RCIC) piping passing through the waterline region of the suppression pool	One-time inspection activity 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 during the period of extended operation.
A sample of 25 one-foot long locations of the mechanical draft cooling towers galvanized spray piping will be inspected	One-time inspection activity 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 during the period of extended operation.

Inspections will be performed within the ten years prior to the period of extended operation.

A.1.45 Coating Integrity Program

The Coating Integrity Program is a new program that will include periodic visual inspections of coatings/linings applied to the internal surfaces of in-scope piping, piping components, heat exchangers, and tanks where loss of coating or lining integrity could prevent accomplishment of a license renewal intended function. For coatings/linings that do not meet the acceptance criteria, physical testing is performed where possible (i.e., sufficient room to conduct testing) in conjunction with visual inspection. Hand tool cleaning and power tool cleaning will be controlled by site procedures that incorporate standards established by the Society of Protective Coatings (SSPC). Specifically, the standards include SSPC-SP 2 Hand Tool Cleaning, SSPC-SP 3 Power Tool Cleaning, and SSPC-SP 11 Power Tool Cleaning to Bare Metal. Further, where applicable, standards for water-jet cleaning will also be incorporated. These would include SSPC-SP WJ-1, 2, 3, and 4. Although there is not an SSPC standard for tap testing, guidance for tap testing is provided in the EPRI Comprehensive Coatings Training Course. This guidance will also be incorporated into site procedures. The training and qualification of individuals involved in inspections of non-cementitious coatings/linings are in accordance with ASTM standards endorsed in RG 1.54. In addition, the EPRI Comprehensive Coatings Training Course will be incorporated into site training and qualification requirements for a Coating Specialist. For cementitious coatings, training and qualifications are based on an appropriate combination of education and experience related to inspecting concrete surfaces. Service Level 1 coatings are managed by the Protective Coating Monitoring and Maintenance Program (Section A.1.36).

B.1.33 ONE-TIME INSPECTION

The program will include activities to verify effectiveness of aging management programs and activities to confirm the insignificance of aging effects as described below.

A representative sample of internal and external surfaces of RCIC piping passing through the waterline region of the suppression pool	One-time inspection activity 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 during the period of extended operation.
A sample of 25 one-foot long locations of the mechanical draft cooling towers galvanized spray piping will be inspected	One-time inspection activity 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 during the period of extended operation.

Inspections will be performed within the ten years prior to the period of extended operation.

B.1.45 COATING INTEGRITY

Program Description

The Coating Integrity Program is a new program that will include periodic visual inspections of coatings/linings applied to the internal surfaces of in-scope piping, piping components, heat exchangers, and tanks where loss of coating or lining integrity could prevent accomplishment of a license renewal intended function. For coatings/linings that do not meet the acceptance criteria, physical testing is performed where possible (i.e., sufficient room to conduct testing) in conjunction with visual inspection. Hand tool cleaning and power tool cleaning will be controlled by site procedures that incorporate standards established by the Society of Protective Coatings (SSPC). Specifically, the standards include SSPC-SP 2 Hand Tool Cleaning, SSPC-SP 3 Power Tool Cleaning, and SSPC-SP 11 Power Tool Cleaning to Bare Metal. Further, where applicable, standards for water-jet cleaning will also be incorporated. These would include SSPC-SP WJ-1, 2, 3, and 4. Although there is not an SSPC standard for tap testing, guidance for tap testing is provided in the EPRI Comprehensive Coatings Training Course. This guidance will also be incorporated into site procedures. The training and qualification of individuals involved in inspections of non-cementitious coatings/linings are in accordance with ASTM standards endorsed in RG 1.54. In addition, the EPRI Comprehensive Coatings Training Course will be incorporated into site training and qualification requirements for a Coating Specialist. For cementitious coatings, training and qualifications are based on an appropriate combination of education and experience related to inspecting concrete surfaces. Service Level 1 coatings are managed by the Protective Coating Monitoring and Maintenance Program (Section B.1.36).

B.1.45 COATING INTEGRITY

Exceptions to NUREG-1801

Element Affected	Exception
7. Corrective Actions	For coatings/linings exhibiting delamination and peeling that are returned to service, NUREG-1801 recommends physical testing~~,~~ and adhesion testing using ASTM International standards endorsed in RG 1.54~~, and follow-up inspections~~. In the Fermi 2 program, physical testing of delamination and peeling will consist of lightly tapping the coating, light hand scraping, or light power tool cleaning~~, or adhesion testing~~ when a nondestructive adhesion test method cannot be applied. These physical testing methods may also be used as an alternative to nondestructive adhesion testing when both of the following conditions apply: 1) the peeling and delamination is occurring in a tank, pipe, or piping component with laminar or no flow conditions and 2) the scope of interrogation is expanded beyond the damage area with large margins to ensure that all loose coatings have been removed. Destructive adhesion testing will not be conducted. ~~Follow-up inspection and re-inspection intervals will be in accordance with NUREG-1801 recommendations unless longer inspection intervals are technically justified.~~[3]

Exception Notes

3. NUREG-1801 allows an alternative to adhesion testing when adhesion testing is not physically possible due to physical constraints. Although the discussion in NUREG-1801 is in the context of blisters, this exception is also applicable in the case of peeling and delamination since the physical constraints are not dependent on the type of coating degradation.

   Adhesion testing will be applied in the cases where peeling or delamination has progressed to the base metal since the coating has already been damaged and the potentially destructive adhesion test will have little impact to the overall damaged area.

   It is preferable to leave delamination and peeling that has not progressed to the base material intact instead of removing the entire coating system down to bare metal. Some material protection will still be provided by the intact coating layers. This may also facilitate future repairs of the coating system in this location since a smaller number of coats would be required to achieve the desired dry film thickness. The performance of destructive adhesion testing may damage intact coating layers. A physical testing alternative to adhesion testing can be employed when there is no concern that coatings could come off due to flow. Coatings are not expected to detach due to flow in tanks, pipes, and piping components with no flow or laminar flow conditions. To ensure that the extent of the peeling and delamination has been addressed, a larger area around the degraded coating will be examined when the adhesion testing will not be performed.
   ~~Follow-up visual inspections of damaged areas will be conducted within 2 years from detection of the degraded condition, with re-inspection within an additional 2 years, or until the degraded coating is repaired or replaced. In cases where equipment history is known and understood, extending inspections and re-inspections beyond the NUREG-1801 recommendations may be made with technical justification.~~

Element Affected	Exception
7. Corrective Actions	For blisters not repaired, NUREG-1801 recommends physical testing consisting of adhesion testing using ASTM International standards endorsed in RG 1.54. In the Fermi 2 program, for blisters not repaired, physical testing will consist of lightly tapping the coating, light hand scraping, or light power tool cleaning~~, or adhesion testing~~ when a nondestructive adhesion test method cannot be applied. These physical testing methods may also be used as an alternative to nondestructive adhesion testing when both of the following conditions apply: 1) the peeling and delamination is occurring in a tank, pipe, or piping component with laminar or no flow conditions and 2) the scope of interrogation is expanded beyond the damage area with large margins to ensure that all loose coatings have been removed. Destructive adhesion testing will not be conducted.[4]

Exception Notes

4. Destructive adhesion testing will remove potentially sound material surrounding a blister. Leaving this material intact will continue to provide some degree of protection. Additionally, the removal of sound coating material via destructive testing may increase the likelihood of base material degradation due to exposure. A physical testing alternative to adhesion testing can be employed when there is no concern that coatings could come off due to flow. Coatings are not expected to detach due to flow in tanks, pipes, and piping components with no flow or laminar flow conditions. To ensure that the extent of the blisters has been addressed, a larger area around the degraded coating will be examined when the adhesion testing will not be performed.