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March 13, 2020
NRC-20-0019

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: Change in DTE Commitment Regarding Containment Coatings
and Additional Information

- References:
- 1) DTE Letter to NRC, "DTE Commitment Regarding Containment Coatings," NRC-19-0065, dated September 26, 2019 (ML19270E090)
 - 2) NRC Letter to DTE, "Confirmatory Action Letter – Fermi Power Plant, Unit 2 Commitment to Address Degraded Torus Coatings," EA-19-097, dated October 4, 2019 (ML19280D881)

In Reference 1, DTE Electric (DTE) made a commitment to mitigate the degraded coating in the submerged portion of the pressure suppression chamber, also referred to as the torus. The DTE commitment was subsequently confirmed by the NRC in the Confirmatory Action Letter (CAL) in Reference 2. The CAL indicated that the NRC Region III Administrator should be notified, in writing, if for any reason DTE intended to change, deviate from or not complete the documented commitment set forth in References 1 and 2, and advise the NRC Region III Administrator, in writing, of the changes or deviations.

The purpose of this letter is to: (1) notify the NRC Region III Administrator of a change to the DTE commitment and (2) provide the NRC Region III Administrator with additional clarifying information regarding the DTE commitment. The change and clarifying information is based on a review of detailed information as part of DTE's ongoing planning for the torus coatings project. The project will be implemented during the next Fermi 2 refueling outage, which will begin no later than April 30, 2020, as originally committed. DTE is not clarifying, modifying, or deviating from the commitment schedule as originally stated in References 1 and 2.

The original DTE commitment as previously made in Reference 1, and confirmed in Reference 2, is provided as follows for reference:

DTE commits to mitigate the degraded coating in the submerged portion of the torus by removing all coating in the submerged portion of the torus, including torus internals, and applying a qualified coating capable of withstanding design basis accident conditions. This DTE commitment will be completed prior to resuming power operation following the next refueling outage. The next refueling outage will begin no later than April 30, 2020.

As part of DTE's ongoing planning for the torus coatings project to implement this commitment, DTE has performed reviews of torus coating documentation. These reviews have determined that the coated internal surfaces of the submerged portion of the downcomers and the coated internal surfaces of the submerged portion of process piping do not have degraded coating. Complete removal of the existing coating and application of new qualified coating to the internal surfaces of the submerged portions of these components is unnecessary and could result in potential risk to personnel and associated systems. Instead, DTE will perform inspections of the coating on these internal surfaces during the next refueling outage. If the inspections confirm that, as expected, the coating is not degraded, coating removal and new qualified coating application will not be performed for these components. In the very unlikely event that the inspections identify degraded coating on these internal surfaces, the degraded coating will be removed. Either way, the intent of the commitment to mitigate degraded coatings in the submerged portion of the torus will still be met. Consistent with this information, the DTE commitment is changed as follows:

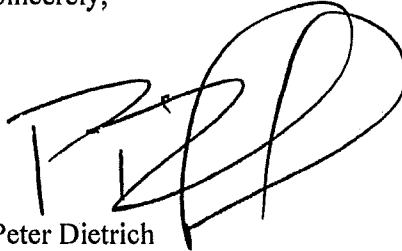
DTE commits to mitigate the degraded coating in the submerged portion of the torus by removing all coating in the submerged portion of the torus and applying a qualified coating capable of withstanding design basis accident conditions. Removal of coating and application of qualified coating will also be performed for torus internals in the submerged portion of the torus with the exception of the internal surfaces of the downcomers and the internal surfaces of process piping. The internal surfaces of the submerged portion of the downcomers and the coated internal surfaces of the submerged portion of process piping will be inspected and degraded coating, if any, will be removed during the next refueling outage. This DTE commitment will be completed prior to resuming power operation following the next refueling outage. The next refueling outage will begin no later than April 30, 2020.

Enclosure 1 to this letter provides additional clarifying information regarding the DTE commitment that does not change the commitment intent. This clarifying information is provided to promote a common understanding of the DTE commitment. Enclosure 2 to this letter provides additional detail and technical basis supporting the change in commitment.

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Should you have any questions or require additional information, please contact Ms. Margaret (Peg) Offerle, Manager – Nuclear Licensing, at (734)586-5076.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. Dietrich', with a large, stylized flourish extending from the end of the signature.

Peter Dietrich
Senior Vice President and Chief Nuclear Officer

Enclosures: 1) Clarifying Information Regarding Containment Coatings Commitment
2) Supporting Information for Change in Containment Coatings Commitment

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

**Enclosure 1 to
NRC-20-0019**

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

Clarifying Information Regarding Containment Coatings Commitment

CLARIFYING INFORMATION REGARDING CONTAINMENT COATINGS COMMITMENT

This Enclosure is provided to promote a common understanding regarding certain terms that the NRC and DTE Electric (DTE) may use during discussions of torus-related activities. The below discussion is not intended to alter the meaning or intent of the original DTE commitment in Reference 1 or the associated NRC Confirmatory Action Letter (CAL) in Reference 2.

Clarification Regarding the Phrase “Degraded Coatings”

The commitment in the DTE letter and confirmed in the NRC CAL utilized the phrase “degraded coating” but no specific definition of this phrase was provided. The phrase was also utilized in the Special Inspection Report in Reference 3 without a specific definition. To avoid the potential for confusion regarding the meaning of this phrase as it pertains to the commitment, clarification is provided in this subsection.

In the Special Inspection Report in Reference 3, DTE received two findings of very low safety significance (Green) that were classified as non-cited violations (NCVs). The first NCV referred to “the degrading condition of the improperly cured torus coating” and the second NCV referred to “the improperly cured torus coating.” Further explanation of the meaning of improperly cured torus coating is provided in the Special Inspection Report sequence of events (Special Inspection Charter Item #1):

In 1989, during Fermi’s first refueling outage (RF), licensee contractors inspected the torus coating and discovered “severe blistering” of all coatings between 4 to 8 o’clock of the torus bottom. An adhesion test was performed showing “poor” adhesion of the affected coatings. The contractor’s coating consultant completed a torus coating suitability review on behalf of the licensee and found the blisters formed because of solvent entrapment due to lack of forced heat curing following coating application.

The above discussion from the Special Inspection Report is consistent with the DTE letter sent to the NRC in 1989 (Reference 4) that also described a region of blistered coating from approximately 4 o’clock to 8 o’clock at the bottom of the torus caused by solvent entrapment due to improper curing. The use of “degraded coating” in the DTE commitment letter was intended to be synonymous with this condition of severely blistered coating.

The phrase “degraded coating” in the context of the DTE commitment and corresponding NRC CAL refers to the severely blistered coating condition caused by solvent entrapment due to improper curing in the large region at the bottom of the torus (approximately 4 o’clock to 8 o’clock). It also refers to the coating condition of internal components that are not part of the pressure boundary that have severe blistering caused by solvent entrapment due to improper curing. Although any minor coating defect such as a nick caused by mechanical damage or an isolated blister could be interpreted as a degraded coating, this was not the intended scope of the phrase “degraded coating” in the DTE commitment. Minor coating defects or deficiencies can be repaired or accepted as is (depending on type and location) during routine inspections in

accordance with the program described in UFSAR Section B.1.36, "Protective Coating Monitoring and Maintenance Program," which was reviewed and approved by the NRC as part of the license renewal in Reference 5. The Fermi 2 Protective Coating Monitoring and Maintenance Program is based on ASTM D5163-08, "Standard Guide for Establishing a Program for Condition Assessment of Coating Service Level I Coating Systems in Nuclear Power Plants."

Clarification Regarding the Submerged Portion of the Torus

As shown in Figure 1 in this Enclosure, the bottom of the inside of the torus is at an elevation of 542'6". The normal water level inside the torus corresponds to an elevation of 557'. Per the Fermi 2 Technical Specifications (TS), the torus water level is required to be within ± 2 " of this level during Modes 1, 2, and 3. The DTE commitment letter and the NRC CAL both refer to the "submerged portion of the torus." Conservatively using the maximum torus level allowed by the TS, the submerged portion of the torus therefore corresponds to internal areas of the torus below an elevation of 557'2".

Clarification Regarding the Extent of "Degraded Coatings"

As described previously, the phrase "degraded coatings" in the context of the commitment refers to the severe blistering caused by improper curing. Reference 4 provides information that the original torus coating was properly cured but required repairs in some areas due to subsequent containment modification work. The repair coating was improperly cured and became severely blistered. During the planning work for the current coatings project, and subsequent to the DTE commitment letter and NRC CAL, DTE reviewed records associated with the recoating work described in Reference 4. These records reflect that in 1983 the original coating was removed, and repair coating applied, below an elevation of approximately 547'6". Based on this information, the extent of the coating subjected to improper curing leading to solvent entrapped blisters would be the coating below the 547'6" elevation.

Comparison of this elevation was then made to the three different methods of describing the extent of degraded coating condition in the Special Inspection Report:

- 7,000 square feet of pressure boundary.
- An arc beginning at the torus bottom and extending 12 feet up in each direction, which corresponds to an elevation of approximately 547'3".
- The 4 o'clock to 8 o'clock position, which corresponds to an elevation of approximately 550'3".

Using the most conservative of these methods (based on surface area), the extent of the degraded coating region is the internal areas of the torus up to an elevation of 550'3". This extent of condition is well below the maximum torus water level of 557'2". Therefore, removing all coating below elevation 557'2" and applying a qualified coating capable of withstanding design basis accident conditions will fulfill the intent of the commitment to "mitigate the degraded coating in the submerged portion of the torus" with margin.

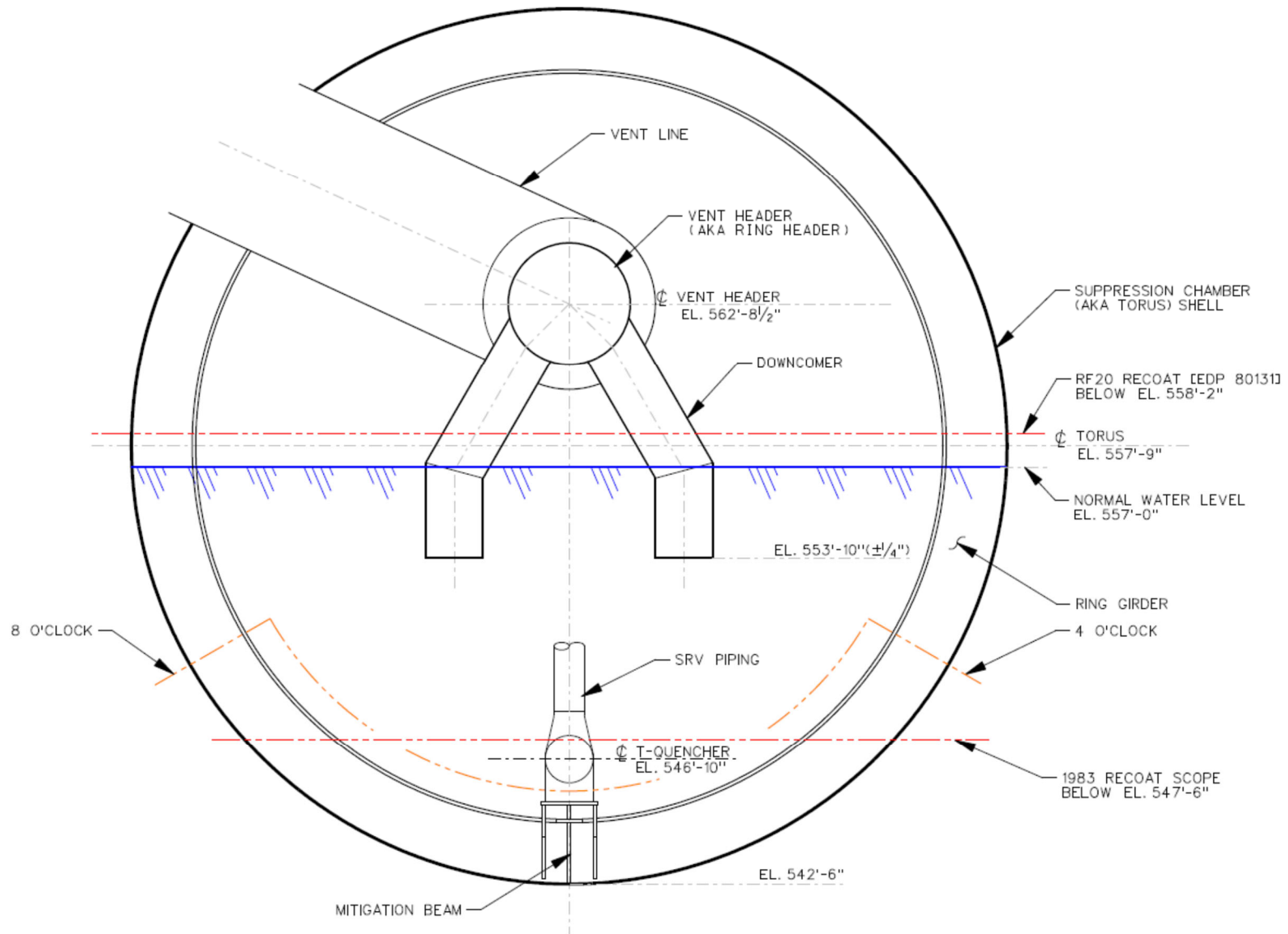
Clarification Regarding Uncoated Torus Internals

As described in the Special Inspection Team Charter included in Reference 3, the concern prompting the special inspection was the potential for the degraded torus coatings to block the torus suction strainers during a design basis accident (DBA). The Fermi 2 torus contains components which are uncoated, which will remain uncoated, such as the safety relief valve (SRV) T-quenchers and the torus suction strainers themselves. These components do not have coating that can contribute to blockage of the torus suction strainers and can remain uncoated. Although these uncoated components may be located in the submerged portion of the torus, they are outside of the scope of the DTE commitment.

References

- 1) DTE Letter to NRC, "DTE Commitment Regarding Containment Coatings," NRC-19-0065, dated September 26, 2019 (ML19270E090)
- 2) NRC Letter to DTE, "Confirmatory Action Letter – Fermi Power Plant, Unit 2 Commitment to Address Degraded Torus Coatings," EA-19-097, dated October 4, 2019 (ML19280D881)
- 3) NRC Letter to DTE, "Fermi Power Plant, Unit 2 – Special Inspection Reactive Report 05000341/2019050," EA-19-097, dated January 31, 2020 (ML20031D253)
- 4) DTE Letter to NRC, "Results of Inspections and Repairs of Primary Containment / Torus Coatings During First Refueling Outage," NRC-89-0191, dated October 31, 1989
- 5) NRC Letter to DTE, "Issuance of Renewed Facility Operating License No. NPF-43 for Fermi Nuclear Power Plant, Unit 2 (CAC No. MF4222)," dated December 15, 2016 (ML16351A459)

Figure 1: Pressure Suppression Chamber (Torus) Layout



**Enclosure 2 to
NRC-20-0019**

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

Supporting Information for Change in Containment Coatings Commitment

SUPPORTING INFORMATION FOR CHANGE IN CONTAINMENT COATINGS COMMITMENT

Downcomer Internal Surfaces

As described in the Fermi 2 Updated Final Safety Analysis Report (UFSAR) Section 6.2.1.2.1.3, 80 downcomer pipes, each 24" in diameter, extend downwards from the vent header and terminate below the surface of the water in the suppression chamber pool (refer to Figure 1 in Enclosure 1). Based on a downcomer bottom elevation of 553'10" as shown in Figure 1 of Enclosure 1 and the range of Technical Specifications (TS) allowable torus water level, the downcomer pipes are submerged between 3' and 3'4" during normal plant operations.

Both the internal and external surfaces of the downcomers are coated as described in UFSAR Section 6.2.1.6. Since the bottoms of the downcomers (i.e., approximately 3') are torus internals that are coated and are in the submerged portion of the torus, the original DTE commitment in Reference 1 and NRC Confirmatory Action Letter (CAL) in Reference 2 would indicate that the current coating (both internal and external) at the bottom of the downcomers should be removed and replaced with qualified coating capable of withstanding design basis accident (DBA) conditions.

Consistent with this understanding, the DTE torus coating project plans to remove the current coating from the external surfaces of the bottom of the downcomers and apply the same DBA-qualified coating as will be used on the torus. Given the planned removal elevation of 558'2" as shown in Figure 1 of Enclosure 1, this will result in new DBA-qualified downcomer external coating with a foot of elevation margin above the normal submergence of the downcomers.

Project planning has identified several risks to personnel safety when removing existing coating from the internal surfaces of the bottom of the downcomers and applying new coating to these internal surfaces. If no coating degradation on the existing downcomer internal coating exists, removing the existing coating to apply new coating will result in these unnecessary risks to personnel safety:

- To remove the coating and apply new coating would require personnel to enter the downcomers. Since the downcomer diameter is only 24", this would be a very restrictive space to safely and properly perform work.
- The planned method of removing coating is blasting. Personnel would be required to be in close proximity to the area being blasted which would involve additional industrial safety risk.
- The inside of the downcomers is likely to be a high dose area with a high potential for personnel contamination events. Unnecessary work performed inside the downcomers should be minimized or avoided to maintain personnel doses as low as reasonably achievable (ALARA).

Since the intent of the DTE commitment is to "mitigate the degraded coating in the submerged portion of the torus," DTE performed a review to determine whether the downcomer internal

coating was in fact a degraded coating. As described in the clarifications in Enclosure 1, the phrase “degraded coating” in the context of the DTE commitment and NRC CAL refers to those severely blistered coatings created by solvent entrapment due to improper curing. As discussed in Enclosure 1, the degraded coating region is bounded by using the 4 o’clock to 8 o’clock description provided in Reference 4 and subsequent inspection reports, which corresponds to an elevation of 550’3”. The bottom elevation of the downcomers, 553’10”, is well above this extent of condition. Therefore, the downcomer internal coating is the original DBA-qualified coating, was not subjected to recoating and subsequent improper curing in 1983, and is not considered a degraded coating in the context of the DTE commitment.

To further verify this conclusion, DTE re-reviewed torus inspection reports, work orders, and associated Corrective Action Program documents with a focus on the condition of the downcomer internal coatings. DTE also re-watched dive videos with a focus on those that provided video or diver audio evidence of the condition of the downcomer internal coatings. DTE also interviewed the vendor personnel who have performed the most recent dives in the Fermi 2 torus. Based on these reviews, DTE has confirmed that the degraded condition of severe blistering that resulted in the NRC Special Inspection in Reference 3, the DTE commitment, and resultant NRC CAL is not applicable to the downcomer coatings. The documentation reviews provide confidence that the internal coatings on the submerged portion of the downcomers do not need to be replaced.

As additional confirmation, DTE plans to perform inspections of the internal surfaces of the bottom of the downcomers during the next refueling outage (scheduled to begin no later than April 30, 2020). The inspections will be in accordance with the Fermi 2 Protective Coating Monitoring and Maintenance Program. Documentation indicates that downcomers are coated with the original DBA-qualified coating. If the inspections identify coating defects, such as mechanical damage or isolated blisters, the condition would be entered into the Fermi 2 Corrective Action Program and addressed in accordance with the Fermi 2 Protective Coating Monitoring and Maintenance Program which was reviewed and approved by the NRC as part of the license renewal in Reference 5. The Fermi 2 Protective Coating Monitoring and Maintenance Program is based on ASTM D5163-08, “Standard Guide for Establishing a Program for Condition Assessment of Coating Service Level I Coating Systems in Nuclear Power Plants.” In the very unlikely event that downcomer internal inspections identify degraded coatings (i.e., severe blistering), action would be taken to remove that degraded coating in the affected downcomers.

In conclusion, the internal coating on the submerged portions of the downcomers was not subject to the causes that resulted in severe blistering at the bottom of the torus. The coating condition on the bottom downcomer internal surfaces will be inspected. The intent of the commitment to mitigate degraded coatings will be met by either confirmation that degraded coating does not exist or removal of degraded coating, depending on the outcome of the inspections.

Submerged Process Piping Internal Surfaces

The interior of the torus also contains process piping of various sizes. Similar to the downcomers, some of this piping is partially submerged and normally exposed to torus water on external and internal surfaces. For example, the residual heat removal (RHR) and core spray (CS) test lines are partially submerged and terminate at an elevation similar to the bottom of the downcomers. The DTE project plan is to remove the existing external coating and apply new coating to the external surfaces of process piping below an elevation of 558'2". This plan is consistent with the DTE commitment and NRC CAL.

Most of the submerged process piping is internally uncoated and therefore the uncoated internal surfaces of process piping are outside the scope of the commitment. The coated internal surfaces of submerged process piping will be inspected during the next refueling outage (scheduled to begin no later than April 30, 2020). If coating defects are identified, such as mechanical damage or isolated blisters, the condition would be entered into the Fermi 2 Corrective Action Program and addressed in accordance with the Fermi 2 Protective Coating Monitoring and Maintenance Program. In the very unlikely event that submerged process piping internal inspections identify degraded coatings (i.e., severe blistering), action would be taken to remove that degraded coating in the affected process piping.

In conclusion, the condition of the submerged process piping internally coated surfaces will be inspected. The intent of the commitment to mitigate degraded coatings will be met by either confirmation that degraded coating does not exist or removal of degraded coating, depending on the outcome of the inspections.

Additional Scope of DTE Torus Coating Project Beyond the Commitment

The DTE torus coating project plan is to remove and replace coatings below an elevation of 558'2", excluding downcomer and process piping internal surfaces as clarified in the commitment change and also in the above discussions. This project scope elevation is one foot above the 557'2" elevation of the submerged portion of the torus. Although beyond the requirement of the DTE commitment and NRC CAL, recoating to this higher elevation ensures that the interface between the new and existing coatings is well above the normal torus water line.

Conclusion

The DTE commitment regarding containment coatings was originally made in Reference 1 and confirmed in the NRC CAL in Reference 2. The CAL requested that DTE notify the NRC Region III Administrator if for any reason DTE intended to change, deviate from or not complete the documented commitment. Consistent with that request, this submittal notifies the NRC of a change in the DTE commitment due to DTE's ongoing planning for the torus coatings project and based on engineering reviews associated with the project. The change provides an exception to coating removal and new qualified coating application for the internal surfaces of the

submerged portions of the downcomers and process piping provided that inspections to be performed during the next refueling outage confirm the absence of degraded coating.

References

- 1) DTE Letter to NRC, "DTE Commitment Regarding Containment Coatings," NRC-19-0065, dated September 26, 2019 (ML19270E090)
- 2) NRC Letter to DTE, "Confirmatory Action Letter – Fermi Power Plant, Unit 2 Commitment to Address Degraded Torus Coatings," EA-19-097, dated October 4, 2019 (ML19280D881)
- 3) NRC Letter to DTE, "Fermi Power Plant, Unit 2 – Special Inspection Reactive Report 05000341/2019050," EA-19-097, dated January 31, 2020 (ML20031D253)
- 4) DTE Letter to NRC, "Results of Inspections and Repairs of Primary Containment / Torus Coatings During First Refueling Outage," NRC-89-0191, dated October 31, 1989
- 5) NRC Letter to DTE, "Issuance of Renewed Facility Operating License No. NPF-43 for Fermi Nuclear Power Plant, Unit 2 (CAC No. MF4222)," dated December 15, 2016 (ML16351A459)