Fermi2LRANPEm Resource

From: Wentzel, Michael
Sent: Wednesday, November 05, 2014 4:12 PM
To: Lynne S Goodman (goodmanl@dteenergy.com) (goodmanl@dteenergy.com)
Cc: Randall D Westmoreland (westmorelandr@dteenergy.com)
Subject: Draft SAMA RAIs
Attachments: Fermi LRA SAMA RAIs - 110514.docx

Lynne,

Attached are the draft SAMA RAIs. Once you have had a chance to review, I think it would be best if we had a phone call to ensure that what we are asking for is clear. Based on schedules, Wednesday of next week (11/12) might be the first, best day to have a call. If you can give me an idea of what your availability is like (either that day, or another day), I will set up the call. One other note: the wording on a couple of the questions may change slightly prior to the phone call. If that happens, I will forward you any revisions prior to the call. There should not be any substantial changes, however.

Thanks,
Mike

Michael Wentzel
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NRR/DLR/RPB2
(301) 415-6459
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WASHINGTON, D.C. 20555-0001

Mr.Vito Kaminskas
Site Vice President - Nuclear Generation
DTE Electric Company
Fermi 2 - 280 OBA
6400 North Dixie Highway
Newport, MI48166

SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE FERMI 2 NUCLEAR POWER PLANT LICENSE RENEWAL APPLICATION – SEVERE ACCIDENT MITIGATION ALTERNATIVES

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* (10 CFR) Part 51 and 10 CFR Part 54, to renew operating license NPF-43 for Fermi 2 Nuclear Power Plant, for review by the U.S. Nuclear Regulatory Commission (NRC). The NRC 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 Lynne Goodman, and a mutually agreeable date for the response is within 45 days from the date of this letter. If you have any questions, please contact me at 301-415-6459 or e-mail michael.wentzel@nrc.gov.

Sincerely,

Michael Wentzel, Project Manager
Reactor Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket No.50-341

Enclosure:
As stated

cc w/encl: Listserv

Mr.Vito Kaminskas
Site Vice President - Nuclear Generation
DTE Electric Company
Fermi 2 - 280 OBA
6400 North Dixie Highway
Newport, MI48166

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Sincerely,

Michael Wentzel, Project Manager
Reactor Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket No.50-341
Enclosure:
As stated

cc w/encl: Listserv

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Requests for Additional Information on the Fermi 2 Nuclear Station (Fermi 2)
Analysis of Severe Accident Mitigation Alternatives

1. Request the following information regarding the Probabilistic Risk Assessment (PRA) used for the Severe Accident Mitigation Alternative (SAMA) analysis. Basis: Applicants for license renewal are required by 10 CFR 51.53(c)(3)(ii)(L) to consider SAMAs if not previously considered in an environmental impact assessment, related supplement, or environmental assessment for the plant. As part of its review of the Fermi 2 SAMA analysis, NRC staff evaluates the applicant's treatment of internal events and calculation of core damage frequency (CDF) in the Level 1 PRA model. The requested information is needed in order for the NRC staff to reach a conclusion on the sufficiency of the applicant's Level 1 PRA model for supporting the SAMA evaluation.

    a. The environmental report (ER) states that "No other planned major plant modifications, which could adversely impact the SAMA analysis results, have been identified." Request confirmation that this applies to all planned modifications, major or not, and to changes in operating practices/procedures.

    b. Describe any credit being taken in the FermiV9 PRA for the mitigating strategies required by 10 CFR 50.54(hh)(2).

    c. Relative to Table D.1-1:

        i. Provide a more detailed listing of the initiating events percentage contribution to the internal events CDF. Include the breakdown of loss of coolant accidents (LOCAs) by size and/or cause and the various contributors to the general transients and special initiator groups.

        ii. Clarify what is meant by the term, "(without LOSP)" for the general transients descriptions. Are consequential losses of offsite power (LOSPs) modeled and not included in this value?

        iii. Discuss briefly the modeling of the LOSP and station blackout (SBO) scenarios including how the combustion turbine generators are incorporated in the model and how common cause loss of alternating current due to weather is considered.

    d. The Fermi 2 internal events CDF is considerably lower than those for other boiling-water reactor (BWR) 3/4 units. A comparison of CDFs was to have been made in the resolution of the PRA Peer Review (Item 4-16). Provide a discussion of the Fermi 2 CDF in comparison with other similar units and the reasons for any significant differences.

e. Sections D.1.4.3 and D.1.4.4 of the ER list the same model changes from the FermiV2 model for the FermiV3 and FermiV4 models. The CDF for FermiV3 and FermiV4 models are different (3.3E-06 and 5.8E-06, respectively). Clarify the differences between the FermiV3 and FermiV4 models, including the differences between the Equipment Out of Service (EOOS) software and the Computer-Aided Fault Tree Analysis (CAFTA) software used to develop the FermiV3 and FermiV4 models, respectively. Characterize the unavailabilities due to testing and maintenance included in each model and describe the changes to the FermiV4 model resulting from the cited incorporation of recommendations from the prior peer review in the FermiV4 model.

f. Section D.1.4.8 of the ER indicates that one of the reasons that the FermiV9 CDF is lower than previous revisions is the update of Level 1 and Level 2 dependent human error probabilities. On ER page D-74, an expert panel review of the human reliability analysis (HRA) dependency was discussed. Specify the latest update and its relationship to the HRA dependency analysis reviewed by the expert panel.

g. Page D-73 of the ER states that the Fermi 2 Boiling Water Reactors Owners Group PRA Peer Review was performed during August 2012. The PRA used for the SAMA analysis is FermiV9 issued in March 2013 (ER page D-8). This version is described as a complete upgrade of the previous model (ER page D-72). While the changes made in the FermiV8 model, to produce the FermiV9 model, may or may not be “upgrades” as defined in the American Society of Mechanical Engineers (ASME) PRA standard, the changes appear to be extensive and cover almost all Level 1 and 2 PRA tasks. Provide further justification for the technical adequacy of the FermiV9 model including the applicability of the peer review to the upgraded model for both Levels 1 and 2. If the peer review was performed on a draft version of the FermiV9 model, provide the results of the draft and identify changes to the draft to produce the model used for the SAMA analysis.

h. For the peer review findings discussed in Table D.1-21 of the ER:

   i. The resolution of Item 3-26 is a repeat of the finding. Provide the resolution of this item.

   ii. For Item 4-23, confirm that there are no floor drains from one flood zone to another that have check valves but no sump pump.

2. Request the following information relative to the Level 2 analysis. Basis: Applicants for license renewal are required by 10 CFR 51.53(c)(3)(ii)(L) to consider SAMAs if not

previously considered in an environmental impact assessment, related supplement, or environmental assessment for the plant. As part of its review of the Fermi 2 SAMA analysis, NRC staff evaluates the applicant's treatment of accident propagation and radionuclide release in the Level 2 PRA model. The requested information is needed in order for the NRC staff to reach a conclusion on the adequacy of the applicant's Level 2 PRA model for supporting the SAMA evaluation.

a. The ER states that FermiV9 upgrade included the conversion of the Risk Management (RISKMAN)-based CAFTA Level 2 to an upgraded CAFTA Level 2 model (based on first principles). Request more detail on the extent of use of the RISKMAN software based individual plant examination (IPE) Level 2 model in the current model and on subsequent changes to the RISKMAN IPE model.

b. Request more information on the containment event trees (CETs) utilized in the Level 2 analysis including the number of CETs, the sequences handled by each CET, and how LOSP and SBO sequences are addressed.

c. Relative to the CET functional nodes and descriptions presented in Table D.1-4:

    i. Discuss the treatment of containment isolation failure sequences and if subsequent early containment failure is modeled.

    ii. Discuss the treatment of, and the nature of, credit taken for containment sprays in the Level 2 model.

d. Relative to the definition of accident classes provided in Table D.1-8 of the ER, the accident subclasses for Class IV appear to be combined and subsequently modeled as a single class having a frequency that is 13.3 percent of the total CDF. Request additional information supporting this treatment and the meaning of "(not used)" in the class definitions.

e. Page D-56 of the ER describes a situation in which the release category frequency used in the SAMA analysis is less than that in the Fermi PRA documentation. This is described as due to addressing "an issue with under counting of Class II contribution" in the PRA. Explain the cause of this "undercounting" and its potential impact on the SAMA analysis.

f. Describe briefly the basis for determining the release category for each of the CET end points without the need for Modular Accident Analysis Program (MAAP) analysis for each of the CET end points.

g. Provide a discussion of the representative accident scenarios used for the determination of the release characteristics for each of the release categories including:

   i. A description of each scenario

   ii. Bases for the selection of the representative scenarios

   iii. Steps taken to ensure that the benefit of a SAMA is not underestimated, particularly for scenarios impacted by the SAMA that may not have the dominant frequency but may have a significantly larger consequence than that for the representative scenario. See for example, the situation that might occur if a SAMA impacted the High Early (H/E) release category scenario represented by MAPP case EF120521 with a cesium iodine (CsI) release fraction of 0.72 (see ER Reference D.1-31 “Fermi 2 Nuclear Power Station – Preparation of Input for Ex-Plant Consequence Analysis MAAP to MACCS2 Interface Notebook”), which is modeled in the ER using MAAP case EF120520 with a CsI release fraction of 0.24.

h. Provide the duration of the MAAP analysis for each release category and provide an assessment of the adequacy of the time to characterize the releases over the full accident duration.

i. Clarify whether plant-specific fission product masses of the relevant fission product elements were used in the MAAP 4.0.7 analyses instead of the isotopic activity of those elements recommended by the MAAP Users Group.

j. Specify the design basis leakage for containment and compare that leakage rate to the release fractions for the containment intact release category.

3. Request the following information with regard to the treatment and inclusion of external events in the SAMA analysis. Basis: Applicants for license renewal are required by 10 CFR 51.53(c)(3)(ii)(L) to consider SAMAs if not previously considered in an environmental impact assessment, related supplement, or environmental assessment for the plant. As part of its review of the Fermi 2 SAMA analysis, NRC staff evaluates the applicant’s treatment of external events in the Level 1 PRA model. The requested information is needed in order for the NRC staff to reach a conclusion on the sufficiency of the applicant’s Level 1 PRA model for supporting the SAMA evaluation.

a. The Fermi 2 license renewal application utilizes a seismic CDF from the Generic Safety Issue (GSI) 199 assessment in developing the external events multiplier used in the SAMA analysis. In response to NRC requests following the accident at the Fukushima Daiichi Nuclear Power Plant, new seismic hazard curves have been developed for each nuclear power plant site. Based on this information, the Electric Power Research Institute has produced updates to the GSI-199 seismic CDFs. Discuss the impact of using the updated Fermi 2 seismic CDF on the Fermi 2 SAMA analysis.

b. As noted in the NRC staff's evaluation report on the individual plant examination of external events (IPEEE), and as can be seen in the IPEEE (Tables 4-6 and 4-13), there is a 1.5E-05/year CDF from the remaining areas screened (with CDFs less than 1E-06/year) that was subjected to the same detailed analysis as the unscreened areas. Because this 1.5E-05/year CDF was not included in the 2.15E-05/year CDF from the unscreened fire areas, provide justification for not including it in the total fire CDF used in the SAMA analysis and/or assess the impact on the SAMA cost-benefit evaluation, particularly with respect to determining the external events multiplier.

4. Request the following information relative to the Level 3 PRA analysis. Basis: Applicants for license renewal are required by 10 CFR 51.53(c)(3)(ii)(L) to consider SAMAs if not previously considered in an environmental impact assessment, related supplement, or environmental assessment for the plant. As part of its review of the Fermi 2 SAMA analysis, NRC staff evaluates the applicant's analysis of consequences in the Level 3 PRA model. The requested information is needed in order for the NRC staff to reach a conclusion on the acceptability of the applicant's Level 3 PRA model for supporting the SAMA evaluation.

    a. Section D.1.5.2.3 of the ER indicates that a watershed index of 1 (drained by rivers) was used for all spatial elements for conservatism. Explain why drainage by rivers is conservative compared to drainage by large water bodies.

    b. The offsite economic cost risk calculation includes an assumption that all crops exposed to radiation are destroyed.

        i. Specify the distances from the point of release that apply to this assumption.

ii. Clarify if the assumption includes destroying crops grown in contaminated soil in the years following the radioactive release and/or crops not grown in contaminated soils.

c. Specify the dollar-to-hectare values and data sources used for farm and nonfarm land in the analysis.

d. For each assessed year, indicate the percentage of missing meteorological data replaced with data substitution.

e. Explain how precipitation events were modeled in the analysis. For rainy days, indicate the duration of precipitation events used in the consequence modeling and if precipitation was spatially dependent. Clarify if there were any assumptions for precipitation in outer boundary cells in the calculation and describe the included assumptions.

f. Estimate the sensitivity of the Level 3 results to the assumed plume heat value of 10 megawatts that was used in the consequence analysis.

g. Explain how the network-wide evacuation speed was computed and how it factored into the total time estimated for evacuation. Indicate if this evacuation speed or time reflects radial distance traveled and if population weighting was included.

h. Specify software codes and the versions used for calculating the core inventory.

i. Provide the basis for the selection of radionuclides listed in the core inventory. For example, radioisotopes for cobalt are not included in Table D.1-23.

j. Confirm if any changes in future fuel management practices or fuel design are planned or being considered that would influence the core inventory.

k. Specify the thermal power level for the core inventory shown in Table D.1-23. Indicate if changes to this thermal power are anticipated and provide any implications on the cost-benefit conclusions for the SAMA analysis due to differences in the thermal power level.

5. Request the following information with regard to the selection and screening of Phase I SAMA candidates. Basis: Applicants for license renewal are required by 10 CFR 51.53(c)(3)(ii)(L) to consider SAMAs if not previously considered in an environmental impact assessment, related supplement, or environmental assessment for the plant. As part of its review of the Fermi 2 SAMA analysis,

NRC staff evaluates the applicant's basis for the selection and screening Phase I SAMA candidates. The requested information is needed in order for the NRC staff to reach a conclusion on the adequacy of the applicant's Phase I SAMA selection and screening process for the SAMA evaluation.

a. Relative to Table D.1-2 of the ER:

   i. SAMA 001, regarding the addition of direct current power supplies, is identified to mitigate event BTTSEDCSCC33_1 (p. D-11) "CC GROUP DC BATTERY FAILS DURING OPERATION 2A, 2B, 2C" and others. This is not a Phase II SAMA, as it was screened out on the basis of being already implemented per DTE Electric Company (DTE) addressing NRC Order 12-049 requirements with a FLEX portable, direct current generator. Confirm that the generator is large enough to carry direct current loads without relying on batteries. Consider other potential cost-beneficial SAMAs, such as increasing the size of the FLEX generator to carry direct current loads or the use of fuel cells.

   ii. For event HE1FUHS1AC001 (p. D-13) "Operators manually start MDCT fan," consider a SAMA to automate the starting of the mechanical draft cooling tower (MDCT) fan, unless the design already includes automatic starting.

   iii. SAMA 129 is cited in the disposition of event %FL-TB-MCWS-TBXX-M (p. D-14) "Major rupture in Circulating Water pipe or expansion joints in Turbine Building" and others. This SAMA is apparently addressed through the External Surfaces Monitoring Program for external degradation and the Internal Surfaces Miscellaneous Piping and Ducting Components Program for internal degradation. Clarify if this is an existing program and if the benefit of this program is incorporated in the current Fermi 2 PRA. Identify other actions that might be taken to mitigate this flood event.

   iv. SAMA 031 is cited in the disposition of event CPFFHPCIMLTSTART (p. D-15) "HPCI fails during subsequent cycles, FW cntl = F, L8 trip =S." In Table D.1-2, SAMA 031 is said to evaluate upgrading HPCI throttling capability to reduce the number of start/stops required. The title or purpose of SAMA 031, as given in ER Section D.2.3 and in NEI 05-01, is to revise procedures to allow intermittent operations of HPCI and RCIC. While a SAMA for upgrading HPCI (and RCIC) throttling capability

to reduce the number of start/stops required would mitigate this basic event, SAMA 031 would not. Identify and evaluate a SAMA that would improve current design or operation that would mitigate this basic event.

v. SAMA 009 to reduce the DC dependence between high pressure injection and ADS is cited to mitigate event TPFSHPCIC001A for "failure of the turbine-driven high pressure coolant injection pump to start" (p. D-18). Explain how this SAMA mitigates the event because common cause failure of direct current would not be included in this event. Include other potential SAMAs that might be applicable in the discussion.

vi. SAMA 101 for "improving leak detection procedures" is cited for a number of events (e.g., %FL-AB-FPRO-RELAY-N) in Tables D.1-2 and D.1-5. This SAMA is not included as a Phase II SAMA in the cost benefit evaluation in Section D.2.3. Clarify if this treatment is because of the currently in progress implementation of a risk informed in-service inspection program based on ASME Code Case N-716, which explicitly addresses internal flooding initiators for inclusion in the in-service inspection program. Because internal flooding is a significant contributor to the CDF, discuss the impact of the risk-informed in-service inspection program on this contribution and the potential that other mitigating actions might be cost beneficial.

vii. Discuss the potential for a flood barrier to prevent flood propagation to adjacent flood areas through openings and/or failed flood doors for flood events such as %FL-AB-FPRO-RELAY-N "Nominal rupture in FPS line in AB propagating to Relay Room," %FL-TB-MCWS-TBXX-M "Major rupture in Circulating Water pipe or expansion joints in Turbine Building," and %FL-AB-ECW2-B20XX-N, "Nominal rupture in RBCCW/EECW Div 2 line in DC Switchgear Room."

viii. The DTE response to EA-12-050, which is stated to include measures that would increase the likelihood of successful containment venting to prevent containment overpressure, is cited in the disposition of event CPFFRBLDFAILDUCTL1 "COND. PROB. THAT ADVERSE ENVIRONMENT FAILS EQUIPMENT IN RB BASEMENT (LEVEL 1)" (p. D-28). Describe the specifics of this response that would impact this basic event.

b. ER Section D.2.1 indicates that documentation for 11 previous industry SAMA analyses were reviewed to identify potential SAMA candidates. Discuss how SAMAs from these sources were selected for incorporation into the Fermi 2 Phase I SAMA identification.

c. Documentation on the identification and disposition of all Phase I potential candidate SAMAs does not address vulnerabilities or enhancements from the IPE. While no vulnerabilities were found in the IPE, several opportunities for enhancements were identified. The status of these enhancements is not addressed in the LRA ER nor elsewhere in the cited supporting documents. The NRC staff SER on the IPE notes that the hard-piped containment venting was installed but indicates that several potential plant improvements were identified for further consideration. Confirm whether or not all IPE identified "enhancements" have been implemented and further consider those that may not have been implemented.

d. Relative to the Phase I screening of candidate SAMAs, Phase I SAMA 086 to install a filtered containment vent to remove decay heat was combined with SAMA 123 for an anticipated transient without scram (ATWS) sized filtered containment vent. Because a filtered vent to remove decay heat is considerably smaller than that required for an ATWS event, the evaluation of SAMA 123 does not appear to be valid for SAMA 086. Provide an evaluation of SAMA 086.

6. Request the following information with regard to the Phase II cost-benefit analysis and site-specific cost estimations. Basis: Applicants for license renewal are required by 10 CFR 51.53(c)(3)(ii)(L) to consider SAMAs if not previously considered in an environmental impact assessment, related supplement, or environmental assessment for the plant. As part of its review of the Fermi 2 SAMA analysis, NRC staff evaluates the applicant's cost-benefit analysis of Phase II SAMAs. The requested information is needed in order for the NRC staff to reach a conclusion on the acceptability of the applicant's cost estimations for individual SAMAs and the cost-benefit analysis.

   a. Identify what is included and what is not included in the Fermi 2-specific cost estimates, including such things as contingency, replacement power, lifetime maintenance, etc.

   b. For SAMA 012 to improve the 4.16-kV cross-tie ability, describe the existing Fermi 2 cross-tie capability, what the SAMA involves, and how it compares to the cited source for the cost estimate.

c. For SAMA 023 on developing procedures to repair or replace failed 4 kV breakers, the benefit is estimated by eliminating failure of the operator to cross tie non-emergency buses, failure to recover AC power from plant and switchyard-centered events, as well as failure during operation of non-emergency 4.16-kV buses. Are there other 4-kV breaker failures that can be mitigated by this SAMA?

d. The title of SAMA 031, “Revise procedures to allow intermittent operations of HPCI and RCIC,” is not consistent with the intent of the SAMA as inferred by the description of the analysis of this SAMA. SAMA 031 is indicated to involve the elimination of intermittent operation of HPCI/RCIC by allowing flow to be throttled thus preventing intermittent starts and stops. Clarify the description and intent of this SAMA and provide a consistent evaluation of its cost benefit.

e. For SAMA 074 to improve pneumatic components of safety relief valves (SRVs) and main steam isolation valves (MSIVs), explain how eliminating the air dependency of these valves models improvement of the reliability of SRVs and MSIVs and confirm that all of the pneumatic components and the important relevant failure modes of the valves are considered in the evaluation.

f. Provide further information and justification for the modeling of the benefit of SAMA 078 to enable flooding of the drywell head seal, including the expected containment failure location(s) and why only Class II and IV large rupture sequences were considered. Explain why the benefit is so small considering that Class IV (anticipated transients without scram sequences) would be expected to make up a significant part of release category H/E, which is the major contributor to risk.

g. For SAMA 154, ”Modify procedures to allow switching of the combustion turbines to buses while running,” explain how eliminating all failures during operation of the combustion turbine generators (CTGs), including the startup diesel generator and failures of the CTG transformers during operation, relates to the impact of the SAMA.

h. SAMAs 165 and 166 both address mitigating the failure of emergency core cooling system low pressure permissiveswith a stated order-of-magnitude improvement by operator action to bypass the low pressure permissives (p. D-121). With an associated CDF reduction of 3 percent, explain why the human error probability for this operator action does not appear in the Level 1 importance list.

i. The cost for SAMA 176 to develop a procedure to open the door to the emergency diesel generator buildings upon the high temperature alarm is given as $200,000 based on a Sequoyah Nuclear Power Plant (Sequoyah) estimate. Because this cost exceeds other typical procedure implementation costs, identify the specific source of this estimate in the Sequoyah documentation and provide additional justification on its relevance to Fermi 2.

j. SAMAs 183 and 187 both involve improvements to the alternate shutdown panel. DTE assumed that this reduced the conditional core damage probability (CCDP) of operation from the alternate shutdown panel by a factor of 10. Table D.1-2 includes basic event HE1FRSP-CNTRL "Operators fail to shutdown from outside the main control room" (p. D-10), which is described as included in an internal flood scenario. Provide additional information on how the benefit of these SAMAs was determined including the potential for impacting both fire risk and internal event risk.

k. Provide additional information on how the benefit was determined for SAMAs mitigating internal fires (e.g., SAMAs 183, 187, and 206 through 211) including the determination of the change in fire CDF and how this was used to determine the cost-risk benefit. The information should include:

    i. The differing assumptions in the SAMAs concerning the reduction in CCDP due to the modifications ("... reduced to that for non-severe fires" versus "... being reduced by an order of magnitude").

    ii. The specific source, values, and calculations used to determine the reduced fire CDF for at least one example SAMA.

    iii. How the cost risk benefit was obtained from the reduction in fire CDF.

l. The SAMA costs for fire-related SAMAs 207 through 211 are from two sources, "Fermi Estimate" and "Implementation Cost from Cooper." Explain the reasons that the costs differ significantly between the two sources.

m. SAMAs 213 and 214 both involve providing leak detection and automatic isolation valves for emergency equipment cooling water (EECW) piping in the direct current switchgear room or the Division 2 switchgear room, respectively. The benefit for each was indicated to be based on the assumption that a flood from the piping failure would not result in the failure of any electrical equipment in the switchgear room in which the flood

occurred. These SAMAs were identified to mitigate important flooding events whose disposition in ER Table D.1-2 indicated that the flood would or could cause failures in adjacent electrical rooms. Confirm that the benefit assessment included the elimination of failures in the adjacent rooms.

7. For certain SAMAs considered in the Fermi 2 ER, there may be lower-cost or more effective alternatives that could achieve much of the risk reduction. In this regard, provide an evaluation of the following SAMAs. Basis:Applicants for license renewal are required by 10 CFR 51.53(c)(3)(ii)(L) to consider SAMAs if not previously considered in an environmental impact assessment, related supplement, or environmental assessment for the plant. As part of its review of the Fermi 2 SAMA analysis, NRC staff considers additional SAMAs that may be more effective or have lower implementation costs than the other SAMAs evaluated by the applicant. The requested information is needed in order for the NRC staff to reach a conclusion on the adequacy of the applicant's determination of cost-beneficial SAMAs.

    a. For basic event HE1FRSP-CNTRL "Operators fail to shutdown from outside the main control room" (p. D-10), consider improvements to training for this specific event as opposed to SAMA 145, which is much broader in scope.

    b. Discuss the potential for cost-beneficial SAMAs that include only leak detection as alternatives to SAMAs 213 and 214, both of which involve providing leak detection and automatic isolation valves for EECW piping. Leak detection might provide sufficient time for manual actions to isolate the flood source thereby limiting the failures due to flooding, particularly in adjacent rooms.

SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE FERMI 2 NUCLEAR POWER PLANT, LICENSE RENEWAL APPLICATION – SEVERE ACCIDENT MITIGATION ALTERNATIVES

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