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May 30, 2015

AEP-NRC-2015-52
10 CFR 50.90

Docket Nos. 50-315

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Donald C. Cook Nuclear Plant Unit 1
Response to a Request for Additional Information Regarding the Emergency License Amendment Request to Extend the Allowed Outage Time for an Emergency Diesel Generator

References:

1. Letter from J. P. Gebbie, Indiana Michigan Power Company (I&M), to U. S. Nuclear Regulatory Commission (NRC), "Donald C. Cook Nuclear Plant Unit 1 , Emergency License Amendment Request to Extend the Allowed Outage Time for an Emergency Diesel," AEP-NRC-2015-49, dated May 28, 2015.

2. Email from A. W. Dietrich, NRC, to H. L. Kish, I&M, Request for Additional Information Electrical Engineering Branch of the Office of Nuclear Reactor Regulation Regarding an Emergency License Amendment Request for the Donald C. Cook Nuclear Plant, Unit 1, to Revise Technical Specification Section 3.8.1 to allow for a one time extension of the Completion Time, Indiana Michigan Power Company Docket No. 50-315, dated May 28, 2015.

3. Email from A. W. Dietrich, NRC, to H. L. Kish, I&M, Request for Additional Information Probabilistic Risk Assessment Branch of the Office of Nuclear Reactor Regulation Regarding an Emergency License Amendment Request for the Donald C. Cook Nuclear Plant, Unit 1, to Revise Technical Specification Section 3.8.1 to allow for a one time extension of the Completion Time, Indiana Michigan Power Company Docket No. 50-315, 6:28 a.m., dated May 29, 2015.

4. Letter from J. P. Gebbie, I&M, to NRC, "Donald C. Cook Nuclear Plant Unit 1 Response to a Request for Additional Information Regarding the Emergency License Request to Extend the Allowed Outage Time for an Emergency Diesel Generator," AEP-NRC-2015-50, dated May 30, 2015.

5. Email from A. W. Dietrich, NRC, to H. L. Kish, I&M, Request for Additional Information Probabilistic Risk Assessment Branch of the Office of Nuclear Reactor Regulation Regarding an Emergency License Amendment Request for the Donald C. Cook Nuclear Plant, Unit 1, to Revise Technical Specification Section 3.8.1 to allow for a one time extension of the Completion Time, Indiana Michigan Power Company Docket No. 50-315, 6:21 p.m., dated May 29, 2015.

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This letter provides Indiana Michigan Power Company's (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Unit 1, response to a Request for Additional Information (RAI) by the U. S. Nuclear Regulatory Commission (NRC) regarding an Emergency License Amendment Request to Extend the Allowed Outage Time for an Emergency Diesel Generator.

By Reference 1, I&M submitted a request for an emergency amendment to the Technical Specifications (TS) to Facility Operating License DPR-58. I&M proposed to change TS 3.8.1 to permit extending the B.5 Completion Time (CT) from 14 days to 65 days for an inoperable Emergency Diesel Generator (EDG). The proposed amendment would also revise the TS Surveillance Requirement 3.8.1.2 and 3.8.1.3 to extend the Surveillance Frequency (SF) from 31 days to 82 days, or within 3 days following the inoperable EDG being restored to service, and TS Surveillance Requirement 3.8.1.7 to extend the SF from 92 days to 145 days, or within 3 days following the inoperable EDG being restored to service. By Reference 2, the NRC transmitted RAIs (RAI-EEEB-1 and 2) regarding the proposed emergency amendment. By Reference 3, the NRC transmitted an additional RAI (RAI-APLA-1 through 6) regarding the proposed amendment. By Reference 4, I&M provided a response to Reference 2. By Reference 5, the NRC transmitted RAIs (RAI-APLA-7 and -8) regarding the proposed emergency amendment. This letter provides I&M's response to References 3 and 5.

The preliminary cause of the U1 AB EDG #4 bearing failure was provided in the initial LAR (Reference 1). This cause has since been reviewed by an independent third party and the results of that review are included in Enclosure 3.

Enclosure 5 to Reference 1 contained 12 commitments based on the compensatory actions. Three of these commitments are being revised by this submittal. The first commitment to be revised is as a result of an RAI response as discussed in Enclosure 2 of this letter. The other two Commitments, associated with CNP fire zones, are being revised to change the wording from "guarded" to "protected" to more accurately reflect the language of CNP procedures. Also, one of these two commitments is being changed to correct a cross-unit numbering error.

Enclosure 1 to this letter provides an affirmation statement. Enclosure 2 to this letter provides I&M's response to the NRC's RAIs contained in References 3 and 5. Enclosure 3 to this letter provides a detailed summary of the preliminary Performance Improvement International findings related to Donald C. Cook Nuclear Plant Unit 1 AB Emergency Diesel Generator #4 bearing analysis. Enclosure 4 to this letter provides a description of the risk analysis that supports the RAI responses (RAI-APLA-2 through 8) discussed in Enclosure 2. Enclosure 5 to this letter contains new or revised regulatory commitments associated with this request. Enclosure 6 to this letter provides a description of the risk analysis that supports the RAI responses (RAI-APLA-1) discussed in Enclosure 2.

Copies of this letter and its attachments are being transmitted to the Michigan Public Service Commission and Michigan Department of Environmental Quality, in accordance with the requirements of 10 CFR 50.91.

Should you have any questions, please contact Mr. Michael K. Scarpello, Regulatory Affairs Manager, at (269) 466-2649.

Sincerely,

Q. Shane Lies
Engineering Vice President

JMT/amp

Enclosures:

1. Affirmation
2. Response to Request for Additional Information Regarding One Time Emergency License Amendment Request to revise Technical Specification Section 3.8.1 to permit extending the Completion Time. (RAI-APLA 1 through 8)
3. Summary of Preliminary Performance Improvement International Findings Related to Donald C. Cook Nuclear Plant Unit 1 AB Emergency Diesel Generator #4 Bearing Analysis.
4. Risk Analysis to Support Response to Requests for Additional Information Regarding One Time Emergency License Amendment Request to revise Technical Specification Section 3.8.1 to permit extending the Completion Time. (RAI-APLA 2 through 8)
5. Regulatory Commitments
6. Risk Analysis to Support Response to Requests for Additional Information Regarding One Time Emergency License Amendment Request to revise Technical Specification Section 3.8.1 to permit extending the Completion Time. (RAI-APLA 1)

c: A. W. Dietrich, NRC, Washington, D.C.
J. T. King – MPSC
MDEQ – RMD/RPS
NRC Resident Inspector
C. D. Pederson, NRC Region III
A. J. Williamson, AEP Ft. Wayne, w/o enclosures

Enclosure 1 to AEP-NRC-2015-52

AFFIRMATION

I, Q. Shane Lies, being duly sworn, state that I am Engineering Vice President of Indiana Michigan Power Company (I&M), that I am authorized to sign and file this request with the U. S. Nuclear Regulatory Commission on behalf of I&M, and that the statements made and the matters set forth herein pertaining to I&M are true and correct to the best of my knowledge, information, and belief.

Indiana Michigan Power Company

Q. Shane Lies
Engineering Vice President

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 30 DAY OF May, 2015

Notary Public

My Commission Expires 04-04-2018

DANIELLE BURGOYNE
Notary Public, State of Michigan
County of Berrien
My Commission Expires 04-04-2018
Acting In the County of Berrien

Enclosure 2 to AEP-NRC-2015-52

Response to Request for Additional Information Regarding One Time Emergency License Amendment Request to revise Technical Specification Section 3.8.1 to permit extending the Completion Time. (RAI-APLA 1 through 8)

By letter dated May 28, 2015, Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Unit 1, submitted a license amendment request (LAR) to revise the Appendix A Technical Specifications (TS) for Renewed Facility Operating License DPR-58. The proposed amendment would revise TS 3.8.1 to permit extending the B.5 Completion Time (CT) from 14 days to 65 days for an inoperable emergency diesel generator (EDG). The proposed amendment would also revise the TS Surveillance Requirement 3.8.1.2 and 3.8.1.3 to extend the Surveillance Frequency (SF) from 31 days to 82 days, or within 3 days following the inoperable EDG being restored to service, and TS Surveillance Requirement 3.8.1.7 to extend the SF from 92 days to 145 days, or within 3 days following the inoperable EDG being restored to service.

The U.S. Nuclear Regulatory Commission Probabilistic Risk Assessment Branch has determined that the additional information below is needed to complete the review. By electronic mail dated May 29, 2015, the NRC transmitted a request for additional information (RAI) regarding the May 28, 2015, LAR. This enclosure provides I&M's response to the RAI.

PROBABILISTIC RISK ASSESSMENT BRANCH (APLA)

RAI–APLA-1

Provide clarification on changes made to the 2009 PRA Model of Record and the Fire PRA Model of Record in developing the PRA to support the Unit 1 AB EDG one-time CT extension. (Note: this request was communicated to the licensee via telephone on May 28, 2015, and a response was provided to the NRC on May 28, 2015.)

Response to RAI–APLA-1

Response documented in Enclosure 6

RAI-APLA-2

Confirm that CDF_{inst} and $LERF_{inst}$ (page 6, PRA-QNT-005) are also zero maintenance estimates.

Response to RAI–APLA-2

Response documented in Enclosure 4

RAI-APLA-3

Do the risk calculations include changes to the other surveillance intervals requested for 3.8.1.2, 3.8.1.3, and 3.8.1.7, or can those impacts be determined to be negligible based on the potential impact on the risk assessment?

Response to RAI–APLA-3

Response documented in Enclosure 4

RAI-APLA-4

The submittal provides a typical but not all inclusive list of other activities that will be performed during the one-time EDG CT extension (page 20 of enclosure 2). The submittal also states that required surveillances with short duration are not considered (Page 8 of PRA-QNT-005). However, some surveillances of short duration may increase the likelihood of a transient with a demand for the EDGs. How has this been considered?

Response to RAI–APLA-4

Response documented in Enclosure 4

RAI-APLA-5

The updated internal events results are included in both Table 5.4-1 (PRA-QNT-004) and Table 5.6-1 (PRA-QNT-005). CDF increased from 1.412E-5/yr in the 2009 model of record to 1.268E-4/yr in the updated internal events model. Apparently this increase was primarily due to the removal of the "reduction factor" on CCFs for loss of CCW and ESW. Confirm that the updated internal events model increased the CDF by a factor of 10 over the 2009 model because of the modified CCF values.

Response to RAI–APLA-5

Response documented in Enclosure 4

RAI-APLA-6

A new human action 1FSBO---RCC-OMA associated with the new CVCS cross-tie and cooldown has been introduced. Table 5.2-1 (page 35 PRA-QNT-004), states that the execution time is 15 minutes and assigns a value of 6.58E-4. Provide a summary of all the actions needed to establish the cross-tie including time available, time needed, and the joint HEP used in the sequences.

Response to RAI–APLA-6

Response documented in Enclosure 4

RAI-APLA-7

The LAR states that Tier 3 actions include protecting the alternate (Train A) equipment. Justify not including the Train A motor-driven AFW pump on the protected equipment list discussed in Tier 3 compensatory measures.

Response to RAI–APLA-7

Response documented in Enclosure 4

RAI-APLA-8

The risk assessment credits use of Unit 2 CVCS and AFW via cross-ties as means to provide RCS inventory and heat removal. Justify not including the Unit 2 equipment credited in the Unit 1 risk analysis on the protected equipment list discussed in Tier 3 compensatory measures.

Response to RAI–APLA-8

Response documented in Enclosure 4

Enclosure 3 to AEP-NRC-2015-52

Summary of Preliminary Performance Improvement International Findings Related to Donald C. Cook Nuclear Plant Unit 1AB Emergency Diesel Generator # 4 Bearing Analysis

Donald C. Cook Nuclear Plant (CNP) has engaged Performance Improvement International (PII) and Dr. Chong Chiu to perform analyses of the Unit 1AB Emergency Diesel Generator #4 bearing to identify the cause of the bearing failure that occurred on May 21, 2015. PII and Dr. Chiu are recognized experts in the performance of causal analyses of equipment failures and have been involved in the evaluation of numerous significant nuclear industry equipment failure events.

Dr. Chiu provided a verbal preliminary briefing to CNP Senior Leadership on May 29, 2015, at 1600 hours.

Preliminary investigation included a Gross Scan of the bearing surface and did not identify any large particle foreign material on the bearing surface. Additional testing will be performed to determine if foreign material is embedded in the bearing. While foreign material has not been completely ruled out, it is less likely than previously understood that the failure experienced was debris-induced.

Three significant observations were made during initial analyses that require further investigation.

1) Fine radial cracking was identified on the internal diameter surface of the bearing material.
2) Indication of fretting was present between the bearing and the bearing housing.
3) Higher than normal sulfur content was observed on the bearing.

Dr. Chiu requested that CNP provide additional vibration data and maintenance history associated with the Unit 1AB Emergency Diesel Generator for PII staff evaluation.

While the likelihood of the failure being foreign material related is low, Dr. Chiu stated that in his opinion it is 99 percent certain that the failure was related to the recent maintenance performed. It is therefore concluded with Dr. Chiu's concurrence that there is an equally high probability that there is no common cause failure mode associated with the other three CNP Emergency Diesel Generators.

Enclosure 5 to AEP-NRC-2015-52

REGULATORY COMMITMENTS

The following table identifies an action committed to by Indiana Michigan Power Company (I&M) in this document. Any other actions discussed in this submittal represent intended or planned actions by I&M. They are described to the U. S. Nuclear Regulatory Commission (NRC) for the NRC's information and are not regulatory commitments. All commitments discussed in this table are one-time commitments.

Commitment	**Scheduled Completion Date** (if applicable)
Implement the following actions from Attachment 10 of Cook Nuclear Plants (CNP's) Online Risk Management procedure: a) On duty Fire Brigade and Operations crews will be made aware that an extended outage of Unit 1 fire risk significant equipment (the 1 AB EDG) is being invoked, and the risk management actions below, and fire responses for those areas, should be reviewed. b) The following fire zones are to be protected as fires in these zones have the potential to damage Unit 1 Train A equipment, that are important with the 1 AB EDG (Train B EDG) unavailable: • 15 Unit 1 CD Emergency Diesel Generator Room • 17D Unit 1 East Motor Driven Auxiliary Feed Pump Room • 29A & 29G Unit 1 East Essential Service Water Pump, and Screenhouse MCC, Rooms • 40B Unit 1 Train A 4kV Switchgear Area • 41 & 42A Unit 1 600V Switchgear Areas • 42C Unit 1 Inverter Room • 44S Unit 1/2 Auxiliary Building El. 609', Southwest End (CCW Pp Area) • 55 Unit 1 Electrical Switchgear Room Cable Vault • 62B Unit 1 East Centrifugal Charging Pump Room c) For each fire zone listed above: 1) No elective maintenance on fire detection or fire suppression equipment that will cause the fire detection or fire suppression equipment in the impacted fire zones to be inoperable.	Prior to entering the period of extended AOT and maintained for the duration of the extended AOT

2) Verify installed Fire Detection and Suppression systems are available, as applicable- **AND** - Establish an hourly fire watch tour of the area **- OR -** Establish a continuous fire watch in the area 3) Verify no transient combustibles are stored in the immediate area. This excludes incidental transient combustible material as defined by station procedures. 4) No hot work is allowed in the area. d) Verify Unit 1 Train A is protected. e) Operating Large Switchgear Breakers: 1) Operation of 4kV breakers (on 1A, T11A, 1B, T11B, 1C, T11C, 1D, & T11D) and large 600V breakers (on 11A, 11B, 11C, & 11D) is not allowed on Unit 1, except in response to emergent plant conditions (to minimize the possibility of high energy arc fault and other electrical fires). **- OR -** 2) 4kV and 600V breakers may be operated in support of planned maintenance or Technical Specification surveillances provided the 609' El. 4kV and 600V switchgear areas automatic fire detection and CO2 suppression systems are OPERABLE and in service (i.e. not isolated or bypassed). If not aligned for automatic discharge, CO2 suppression systems must be capable of manual actuation and personnel are to be stationed at the actuation panel ready to actuate room CO2 for the switchgear area, if directed.	
Implement the following actions from Attachment 12 *of* Donald C. Cook Nuclear Plants (CNP's) Online Risk Management procedure: a) On duty Fire Brigade and Operations crews will be made aware that an extended outage of Unit 1 fire risk significant equipment (the 1 AB EDG) is being invoked, and the risk management actions below, and fire responses for those areas, should be reviewed. b) The following fire zones are to be protected as fires in these zones have the potential to damage all Unit 2 Safe Shutdown Equipment.	*Prior to entering the* period of extended AOT and maintained for the duration of the extended AOT.

• 29G Screenhouse MCC Equipment Room • 45 & 46A Unit 2 600V Switchgear Areas • 46B Unit 2 Control Rod Drive Equipment Room • 46C Unit 2 Inverter Room • 46D Unit 2 AB Battery Room • 54 Unit 2 Control Room • 58 Unit 2 Control Room Cable Vault • 59 Unit 2 Auxiliary Cable Vault • 60 Unit 2 Electrical Switchgear Room Cable Vault • 145 Unit 2 Hot Standby Panel Area c) For each fire zone listed above 1) No elective maintenance on fire detection or fire suppression equipment that will cause the fire detection or fire suppression equipment in the impacted fire zones to be inoperable. 2) Verify installed Fire Detection and Suppression systems are available, as applicable-**AND**-Establish an hourly fire watch tour in the area **-OR-** Establish a continuous fire watch in the area 3) Verify no transient combustibles are stored in the immediate area. This excludes incidental transient combustible material as defined by station procedures. 4) No hot work is allowed in the area. d) Operations brief on the following procedures • 2-OHP-4025-001-001, Emergency Remote Shutdown • 12-OHP-4025-001-002, Fire Response Guidelines e) Operating Large Switchgear Breakers:: 1) Operation of 4kV breakers (on 2A, T21A, 2B, T21B, 2C, T21C, 2D, & T21D) and large 600V breakers (on 21A, 21B, 21C, & 21D) is not allowed on Unit 2, except in response to emergent plant conditions (to minimize the possibility of high energy arc fault and other electrical fires). **- OR -** 2) 4kV and 600V breakers may be operated in support of planned maintenance or Technical Specification surveillances provided the 609' El. 4kV and 600V switchgear areas automatic fire detection and CO2 suppression systems are OPERABLE and in service (i.e. not isolated or	

bypassed). If not aligned for automatic discharge, CO2 suppression systems must be capable of manual actuation and personnel are to be stationed at the actuation panel ready to actuate room CO2 for the switchgear area, if directed.	
Equipment listed below will be protected in accordance with plant practices for protected/guarded equipment during the 1 AB EDG repair extended CT period. The following equipment will be posted to limit personnel access to these areas (outside of normal Operational, Security, or Fire Brigade related tour and rounds, shift functions) to that approved as needed by the Shift Manager. Equipment or areas will be posted with signs limiting entry so as to avoid activity or maintenance that might disable remaining risk significant equipment or affect equipment power supplies. There will be no routine work activities outside of expected TS SRs on protected equipment. Operations Shift Manager approval will be required for any emergent work involving this protected equipment. The following equipment or areas will be protected: • EDGs 1 CD EDG, and Unit 2 EDGs • Essential Service Water Pumps (All Unit 1 and Unit 2) • The U1 TDAFP and associated direct current Power sources (including Battery Chargers) & Distribution • 1 CD 4kV Switchgear Rooms, and the 600 VAC and mezzanine areas • 1 CD Station Battery and Battery Chargers • 1 CD 250-Vdc Distribution Panels/Room • U1 Main and Unit Auxiliary Transformers • U1 Reserve Auxiliary Transformers • 69kV Switchyard and SDGs • U1 East Residual Heat Removal (RHR) Pump and Heat Exchanger Rooms • U1 East Centrifugal Charging Pump (CCP) • U1 North SI pump • 345 & 765kV switchyards • U1 DIS Trains • Component Cooling Water Pumps (All Unit 1 and Unit 2) • U1 East Motor Driven Auxiliary Feed Water Pump	Prior to entering the period of extended AOT and maintained for the duration of the extended AOT.

7 References

7.1 PRA-NUPRA-002, 2009 PRA Model of Record, Rev. 1 3/20/2009

7.2 PRA-FIRE-17663-005-LAR, DC Cook Fire PRA Fire-Induced Risk Model, Rev. 1, 11/5/2014

7.3 PRA-UNC-001, Uncertainty Parameters, Rev. 2, 3/20/2009

7.4 PWROG-14001-P, PRA Model for the Generation III Westinghouse Shutdown Seal, Rev. 1, July 2014

7.5 WCAP-16341-P, Simplified Level 2 Modeling Guidelines, Rev. 0, November 2005

7.6 PRA-TH-L1-1, Select Level 1 PRA MAAP4.0.5 Thermal-Hydraulic Analyses, Rev. 0, 5/15/2014

7.7 PRA-TH-L1-2, Level 1 PRA MAAP4.0.5 Thermal-Hydraulic Analyses, Rev. 0, 7/11/2014

7.8 ASME/ANS RA-Sa-2009, Addenda to ASME/ANS RA-S-2008, Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plants, 2/2/2009

7.9 NUREG-1829, Estimating Loss-of-Coolant Accident (LOCA) Frequencies Through the Elicitation Process, April 2008

7.10 NUREG/CR-6890, An Analysis of Loss of Offsite Power Events, December 2005

7.11 Regulatory Guide 1.200, AN APPROACH FOR DETERMINING THE TECHNICAL ADEQUACY OF PROBABILISTIC RISK ASSESSMENT RESULTS FOR RISK-INFORMED ACTIVITIES, Rev. 2, March 2009

7.12 Regulatory Guide 1.177, AN APPROACH FOR PLANT-SPECIFIC, RISK-INFORMED DECISIONMAKING: TECHNICAL SPECIFICATIONS, Rev. 1, May 2011

7.13 Regulatory Guide 1.174, AN APPROACH FOR USING PROBABILISTIC RISK ASSESSMENT IN RISK-INFORMED DECISIONS ON PLANTSPECIFIC CHANGES TO THE LICENSING BASIS Rev. 2 May 2011

7.14 1-OHP-4025-001-001, Emergency Remote Shutdown, Rev. 10, 10/23/2014

7.15 1-OHP-4025-R-INDEX, System Restoration Procedures Index, Rev. 4, 5/9/2013

7.16 1-OHP-4023-ES-1-2, Post LOCA Cooldown and Depressurization, Rev. 16, 3/28/2013

7.17 PRA-QNT-004, Calculation of Regulatory Guide 1.177 Risk Parameters for Potential One-Time Emergency Technical Specification Completion Time Change for Unit 1 AB EDG, Rev. 0, 5/28/2015

Attachment 1 – Files on CD