

January 18, 2005

Mr. Mano K. Nazar
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Senior Vice President and Chief Nuclear Officer
Indiana Michigan Power Company
Nuclear Generation Group
500 Circle Drive
Buchanan, MI 49107

SUBJECT: DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2 - REQUEST FOR
ADDITIONAL INFORMATION REGARDING LICENSE AMENDMENT REQUEST
TO EXTEND ALLOWED OUTAGE TIMES (TAC NOS. MC4525 AND MC4526)

Dear Mr. Nazar:

The U. S. Nuclear Regulatory Commission (NRC) staff has reviewed your license amendment request dated September 21, 2004, (ML042780478) to extend the allowed outage times for the emergency diesel generators, 69 kV offsite power circuit, component cooling water, and essential service water, and has identified areas where additional information is needed to complete its review. Enclosed is the NRC staff's request for additional information.

The items in the Enclosure were discussed with Mr. Waters of your staff, and a mutually agreeable target date of within 60 days of the date of this letter for your response was established. If you have any questions, please contact me at (301) 415-2296.

Sincerely,

/RA/

Carl F. Lyon, Project Manager, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-315 and 50-316

Enclosure: As stated

cc w/encl: See next page

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REQUEST FOR ADDITIONAL INFORMATION

EXTENSION OF ALLOWED OUTAGE TIMES FOR EMERGENCY DIESEL GENERATORS,

69 KV OFFSITE POWER CIRCUIT, COMPONENT COOLING WATER, AND ESSENTIAL

SERVICE WATER

DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2

INDIANA MICHIGAN POWER COMPANY

DOCKET NOS. 50-315 AND 50-316

Risk Assessment

1. The qualitative assessment of fire risk provided in Section 4.2.5 of the license amendment request dated September 21, 2004, does not provide an acceptable basis for concluding the risk of the proposed essential service water (ESW) and component cooling water (CCW) allowed outage time (AOT) extensions is "small" as discussed in Regulatory Guide (RG) 1.174. Provide a quantitative fire risk assessment for the proposed ESW and CCW AOT extensions, including delta core damage frequency (CDF), large early release frequency (LERF), incremental conditional core damage probability (ICCDP) and incremental conditional large early release probability (ICLERP). (RG 1.174, section 2.2.4; RG 1.177, Section 2.3)

For example, a simplified confirmatory calculation performed by the staff using information available in the Donald C. Cook (CNP) individual plant examination (IPE) for severe accident vulnerabilities and individual plant examination of external events (IPEEE) for severe accident vulnerabilities submittals indicates an ICCDP of $7.6E-6$ from fire scenarios when East ESW is out of service for 14 days. A similar calculation shows an ICCDP from fires of about $2.5E-6$ when East CCW is out of service for 14 days. The staff's simplified confirmatory estimate of the increase in CDF from fires is on the order of $1.3E-5$, which is in Region I of RG 1.174.

A quantitative estimate must be provided in this area. Please note that the staff's example is meant to illustrate that fires are potentially important when evaluating the risk from the proposed license amendment; it is not meant to be a comprehensive study nor to specify or suggest the methodology or approach to be used in the licensee's risk assessment.

See the table on the following page for staff's simplified confirmatory example calculation of ICCDP for the East ESW out of service.

ENCLOSURE

Simplified, Confirmatory Calculation: Potential Fire Impact Assuming East ESW Out of Service				
Scenario	Fire Frequency (IPEEE)	Conditional Core Damage Probability (CCDP)	Configuration-Specific Risk	ICCDP over 14 Day AOT
Fire in Zone 40A fails West ESW	8.0E-4 (note 1)	1.83E-1 (note 2)	1.46E-4	5.62E-6
Fire in Zone 40A fails West CCW	8.0E-4 (note 1)	1.65E-2 (note 3)	1.32E-5	5.06E-7
Fire in Zone 44s fails West CCW	2.4E-3	1.60E-2 (note 4)	3.84E-5	1.47E-6
Total ICCDP				7.60E-6
<p>Notes:</p> <ol style="list-style-type: none"> 1. Section 4.8.7 of the IPEEE shows an initiating event frequency of 3.2E-3 and states that there is a 1 in 4 chance the fire is in a specific cabinet in the zone. 2. IPE Table 3.4-1 shows loss of ESW contributes 2.76E-6/yr to CDF. The loss of ESW frequency is given as 1.51E-5/yr. The CCDP is $(2.76E-6)/(1.51E-5) = 1.83E-1$. 3. From Section 4.8.7 of the IPEEE. 4. From Section 4.8.14 of the IPEEE 				

2. Please provide the following information: (If the results for Unit 1 and Unit 2 are similar, only the Unit 1 information need be provided.) (RG 1.174, Sections 2.2.2 and 2.2.4; RG 1.177 Sections 2.3 and 2.4)
 - a. What is the delta CDF and delta LERF, compared to both the current and new base risk, assuming the four AOTs are extended as requested?
 - b. In Tables 1 and 2, for AB emergency diesel generator (EDG) out-of-service: Was this case analyzed with the supplemental diesel generators (SDGs) aligned to T11C and T11D (T21C and T21D) as implied by the first note in the table? If "yes," please provide the results for AB EDG out-of-service with the SDGs aligned to the buses normally supplied by the AB EDG.
 - c. Provide results similar to Tables 1 and 2 for the East CCW and East ESW cases, assuming the SDGs are aligned to T11A and T11B (T21A and T21B).

3. Section 4.2.1 of the submittal says that operator action is necessary to energize and load the necessary emergency bus. Please provide the following: (RG 1.174, Section 2.2.2; RG 1.177, Section 2.3)
 - a. The human reliability analysis for this operator action.
 - b. The dependency analysis for this operator action with other operator actions that may be required in a given core damage scenario, including actions to recover offsite power.
 - c. The importance (e. g., Fussell-Vesely and risk achievement worth) of this operator action for each of the following: (1) the new base case; (2) one EDG out-of-service; (3) one ESW out-of-service; and (4) one CCW out-of-service.
4. Please provide a discussion on the effects of the proposed AOT extensions on dominant accident sequences (sequences that contribute more than 5 percent to risk, for example) to show that the proposed change does not create risk outliers or exacerbate existing risk outliers. Please provide core damage and LERF contributions by initiating event and by sequence type for the current base case, the 69 kV bus out of service, and for a selected EDG, ESW and CCW configuration. (Both units do not have to be provided if the results are similar between units, as is the case for the results presented in Tables 1 and 2 of the submittal.) (RG 1.174, Section 3.3.1)
5. Please provide the results of an uncertainty analysis for the new base case (i.e., with credit for the SDGs) probabilistic risk assessment (PRA) model. Alternately, provide a sensitivity analysis to key assumptions for this application. (RG 1.174, Section 2.2.2; RG 1.177, Section 2.3.5)

PRA Model Scope and Quality

6. Please provide a copy of the facts and observations (F&Os) from the September 2001, PRA model certification, and describe how the significance level "A" and "B" F&Os were resolved. Include the results of the contractor's validation of F&O resolution and assessment to RG 1.200 mentioned in the submittal. (RG 1.174, section 2.2.3.3; RG 1.177, section 2.3.1)
7. Describe the process for maintaining the D. C. Cook PRA models current. What processes or controls were used to ensure the quality of the risk assessment provided in the submittal? Address measures used to ensure that the SDGs were appropriately modeled in the PRA for this analysis. (RG 1.174, Section 2.2.3; RG 1.177, Section 2.3)
8. Section 4.1 of the submittal discusses the SDGs. Do the SDGs require any support systems (e.g., electric power, cooling water, heating, ventilation, and air conditioning, instrumentation and control) in order to start and run? What support (e.g., DC control power) is needed for the circuit breakers connecting the SDGs to buses T11A (T21A), T11B (T21B), T11C (T21C), and T11D (T21D)? How were these dependencies addressed in the model used to calculate the new base case and other plant configurations for the risk assessment? (RG 1.174, Section 2.2.2; RG 1.177 Section 2.3)

9. Does the D. C. Cook PRA model credit repair or recovery of EDGs, the ESW system, or the CCW system? If “yes”: (RG 1.177, Section 2.3.4.2)
 - a. Calculate the change in Unit 1 and Unit 2 CDF and LERF using repair/recovery curves updated to reflect the anticipated mean-time-to-repair for EDGs, ESW and CCW assuming approval of the extended AOTs and justify the appropriateness of these repair time estimates, given that the intent, at least partly, of the extended AOTs is to allow extensive maintenance activities (e.g., complete tear down of an EDG). Alternately, a bounding sensitivity may be performed assuming no recovery or repair is credited for the portion of the EDG, ESW, and CCW unavailability attributable to the extended AOT.
 - b. Calculate the Unit 1 and Unit 2 ICCDP and ICLERP assuming no recovery or repair is credited for the out-of-service EDG, ESW system, or CCW system.
 - c. Describe how EDG, ESW, or CCW recovery or repair is credited in the 10 CFR 50.65 (a)(4) risk assessment when the plant configuration includes an out-of-service EDG, ESW train, or CCW train, respectively?
10. Discuss and provide information on the reliability and availability of offsite power sources relating to the proposed change. Provide the basis for the loss of offsite power (LOOP) frequencies and non-recovery probabilities used in the PRA models. Were they adjusted to reflect the Northeast blackout of August 2003? If not, why not? How is the potential for loss of offsite power given a non-LOOP initiating event (e.g., “consequential LOOP”) modeled in the D. C. Cook PRA models? (RG 1.174, section 2.2.2; RG 1.177 Section 2.3)

Monitoring and Configuration Risk Management Programs

11. Section 4.2.1 of the submittal states: “Structural modifications were made to the CNP PRA model to support the addition of the SDGs. These modifications ... provide the foundation for adding the SDGs to the on-line risk-monitoring program using Safety Monitor™.” (RG 1.174, Section 2.3; RG 1.177, Section 2.3)
 - a. Will the Safety Monitor™ be updated to include SDG credit prior to implementing the extended AOT for the EDG, ESW, or CCW systems?
 - b. Will 10 CFR 50.65 (a)(4) risk assessments take into account the availability of the SDGs?
 - c. Will the SDGs be credited as “available” for more than one unit at a time? If “yes,” how will the credit be partitioned between units during periods when an extended AOT is employed for the EDG, ESW, or CCW system?
12. Section 4.1 of the submittal states: “Also, I&M intends to restrict elective maintenance activities on the SDGs during the time they are used to support an extended AOT.” In Section 4.2.2 of the submittal, it states that the risk calculations credit availability of the

SDGs for extended AOTs of the EDG, CCW or ESW systems. Please clarify whether this calculation input is an “intention” or a commitment. (RG 1.174, section 2.3; RG 1.177, Section 2.3)

13. Will the SDGs be in the D. C. Cook Maintenance Rule Program? How will the “... one and one third days of unavailability per SDG ...” assumed in the analysis be tracked? How will the availability of the SDGs be determined prior to entering an extended AOT for the EDG, CCW, or ESW system? (RG 1.174, Section 2.3; RG 1.177, Section 2.3)
14. As discussed with Mr. Waters, et al., of your staff in a telephone conversation on November 23, 2004, please address the traditional engineering criteria and defense-in-depth factors included in Section 2 of RG 1.174.

Donald C. Cook Nuclear Plant, Units 1 and 2

cc:

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