



**Indiana Michigan
Power Company**
Nuclear Generation Group
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April 28, 2008

AEP:NRC:8381
10 CFR 50.90

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop O-P1-17
Washington, DC 20555-0001

SUBJECT: Donald C. Cook Nuclear Plant Units 1 and 2
Docket Nos. 50-315 and 50-316

Response to Revised Request for Additional Information Regarding Proposed
Amendment on Emergency Diesel Generator Steady State Frequency (TAC Nos.
MD5899 AND MD5900)

- References:
- 1) Letter from J. N. Jensen, Indiana Michigan Power Company (I&M), to U. S. Nuclear Regulatory Commission (NRC) Document Control Desk, "Technical Specification Change of Diesel Generator Maximum Steady State Frequency," AEP:NRC:6381-05, dated June 27, 2007 (ML071910238).
 - 2) Letter from P. S. Tam, NRC, to M. W. Rencheck, I&M, "D. C. Cook Nuclear Plant, Units 1 and 2 - Request for Additional Information Regarding Proposed Amendment on Emergency Diesel Generator Steady State Frequency (TAC Nos. MD5899 and MD5900)," dated November 28, 2007 (ML073190145).
 - 3) Letter from P. S. Tam, NRC, to M. W. Rencheck, I&M, "D. C. Cook Nuclear Plant, Units 1 and 2 - Revised Request for Additional Information Regarding Proposed Amendment on Emergency Diesel Generator Steady State Frequency (TAC Nos. MD5899 and MD5900)," dated March 20, 2008 (ML080720021).

Dear Sir or Madam:

This letter provides Indiana Michigan Power Company's (I&M's) response to a revised Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) regarding a proposed change to the Technical Specification (TS) requirements for maximum frequency during diesel generator steady state operation.

A00/
NRC

By Reference 1, I&M proposed to modify the Donald C. Cook Nuclear Plant TS to change the diesel generator maximum steady state frequency requirements specified in six Surveillance Requirements of TS 3.8.1, "AC Sources – Operating." The change was proposed to correct a nonconservative TS value for the frequency limit. A more conservative value was proposed to ensure centrifugal charging pump motor brake horsepower requirements will be met and to prevent overloading the diesel generators.

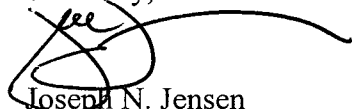
By Reference 2, the NRC requested additional information regarding the proposed amendment. Following telephone discussions between NRC and I&M personnel, the NRC transmitted a revised RAI (Reference 3). This letter provides I&M's response to the revised RAI. The response to one of the RAI questions will involve additional changes to the TS 3.8.1 Surveillance Requirements. These additional changes impose more restrictive voltage limits during diesel generator startup, which are unrelated to the originally proposed changes to the steady state frequency limits. The existing diesel generator startup voltage limits are consistent with the applicable Regulatory Guide and I&M considers the limits to be adequate. However, I&M has elected to impose the more restrictive limits rather than initiate complex and costly analyses requested by the NRC staff to support the existing limits.

Enclosure 1 to this letter provides an affirmation statement pertaining to the information provided herein. Enclosure 2 provides I&M's response to the revised NRC RAI. In a telephone discussion on April 17, 2008, the NRC Licensing Project Manager agreed that this response would be submitted no later than April 28, 2008. This letter contains no new or revised regulatory commitments.

Copies of this letter and its enclosures 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. James M. Petro, Jr., Regulatory Affairs Manager, at (269) 466-2491.

Sincerely,



Joseph N. Jensen
Site Support Services Vice President

JRW/rdw

Enclosures:

1. Affirmation
2. Response to NRC Request for Additional Information

c: J. L. Caldwell, NRC Region III
K. D. Curry, Ft. Wayne AEP, w/o enclosures
J. T. King, MPSC
MDEQ – WHMD/RPS
NRC Resident Inspector
P. S. Tam, NRC Washington, DC

Enclosure 1 to AEP:NRC:8381

AFFIRMATION

I, Joseph N. Jensen, being duly sworn, state that I am Site Support Services Vice President of Indiana Michigan Power Company (I&M), that I am authorized to sign and file this request with the 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



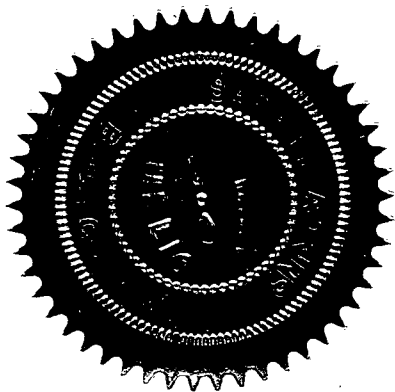
Joseph N. Jensen
Site Support Services Vice President

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 28th DAY OF April, 2008

Sarah L. Adkins
Notary Public

My Commission Expires 9/9/2011



Enclosure 2 to AEP:NRC:8381

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION

References for this enclosure are provided on page 5.

BACKGROUND

By Reference 1, Indiana Michigan Power Company (I&M) proposed to modify the Donald C. Cook Nuclear Plant (CNP) Technical Specification (TS) to change the diesel generator maximum steady state frequency requirements specified in six Surveillance Requirements of TS 3.8.1, "AC Sources – Operating." The change was proposed to correct a nonconservative TS value for the frequency limit. A more conservative value was proposed to ensure centrifugal charging pump motor brake horsepower requirements will be met and to prevent overloading the diesel generators. By Reference 2, the Nuclear Regulatory Commission (NRC) requested additional information regarding the proposed amendment. Following telephone discussions between NRC and I&M personnel, the NRC transmitted a revised request for additional information (RAI) (Reference 3). This enclosure provides I&M's response to the revised RAI.

NRC Question (1)

Clarify how the panel instrument errors are accounted for in the proposed emergency diesel generator (EDG) frequency values indicated in the Technical Specifications (TS).

I&M Response to NRC Question (1)

Panel instrument error is not accounted for in the frequency values in the proposed TS. The proposed TS values for EDG frequency are the analytical limits. Measurement uncertainty is accounted for in TS surveillance procedures. A 0.1 Hertz (Hz) measurement uncertainty is incorporated into the applicable TS surveillance procedures (i.e., the procedural acceptance criteria for the proposed TS maximum value of 60.5 Hz is 60.4 Hz).

NRC Question (2)

Provide the EDG manufacturer's various ratings for the EDGs, such as the continuous and the short-time ratings.

I&M Response to NRC Question (2)

The EDG continuous ratings are 4375 kiloVolt-Amps (kVA) at a 0.8 power factor (3500 kilowatts (kW)). An EDG short time (e.g., 2-hour) rating is not credited in analyses nor tested by the TS Surveillance Requirements.

NRC Question (3)

State which Nuclear Regulatory Commission (NRC) Regulatory Guides, Institute of Electrical and Electronics Engineers Standards, or other guidance documents (and the revision numbers of those documents) to which D.C. Cook is committed for the purposes of EDG design and testing.

I&M Response to NRC Question (3)

The general design criterion applicable to the CNP EDGs is Criterion 39 of the Atomic Energy Commission's proposed General Design Criteria for Nuclear Power Plant construction permits, published for comments, dated July 10, 1967. This criterion is restated in Section 1.4.7 of the CNP Updated Final Safety Analysis Report. Additionally, CNP is committed to IEEE 279-1968, "Proposed IEEE Criteria for Nuclear Power Plant Protection Systems."

The Bases for TS 3.8.1 identifies the specific aspects of the Surveillance Requirements for demonstrating the operability of the EDGs that are in accordance with the recommendations of the Regulatory Guides and IEEE standard listed below. However, this does not constitute a regulatory commitment to these documents.

- Regulatory Guide 1.9, Revision 3, "Selection, Design, Qualification, and Testing of Emergency Diesel Generator Units Used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants."
- Regulatory Guide 1.108, Revision 1, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants."
- Regulatory Guide 1.137, Revision 1, "Fuel-Oil Systems for Standby Diesel Generators."
- IEEE Standard 387-1995, "Standard Criteria for Diesel-Generator Units Applied as Standby Power Supplies for Nuclear Power Generating Stations."

NRC Question (4)

Provide a summary of the latest EDG sizing calculation.

I&M Response to NRC Question (4)

There are two applicable EDG loading scenarios, a loss of offsite power (LOOP) with containment spray and a LOOP with a safety injection. The loading at 60 Hz for each EDG is listed in the table below:

LOOP with Containment Spray

EDG	kW	kiloVAR	kVA
Unit 1 AB	3388	1739	3808
Unit 1 CD	3395	1736	3813
Unit 2 AB	3291	1651	3682
Unit 2 CD	3278	1649	3670

LOOP with Safety Injection

EDG	kW	kiloVAR	kVA
Unit 1 AB	3278	1743	3713
Unit 1 CD	3360	1777	3801
Unit 2 AB	3318	1715	3735
Unit 2 CD	3376	1775	3814

The Unit 1 CD EDG loading is bounding for 60.5 Hz. The 60.5 Hz loading for the 1CD EDG is 3462 kW. 60.5 Hz loading was determined by application of the Affinity laws (which state that brake horsepower increases with the cube of the frequency) to pump and fan loads. Motor loads are assumed to operate at their nameplate horsepower value, at normal frequency, unless a specific analysis has been performed to develop a different brake horsepower value. Specific electrical characteristics for some small motor loads are not available and have been estimated based on motors of similar designs. Static loads (e.g., heaters, battery chargers) are generally assumed to operate at their rated value and were not adjusted for changes in frequency.

NRC Question (5)

Clarify why the voltage values indicated in the SRs [Surveillance Requirements] of TS 3.8.1 are lower than the minimum degraded voltage function allowable value indicated in TS SR 3.3.5.3 (see NRC Information Notice 2007-09, "Equipment Operability Under Degraded Voltage Conditions," ADAMS Accession Number ML070390066).

I&M Response to NRC Question (5)

The minimum steady state EDG voltage value indicated in the EDG Surveillance Requirements of TS 3.8.1 and the minimum degraded voltage function allowable value indicated in TS Surveillance Requirement 3.3.5.3 are both greater than or equal to the minimum voltage at the 4 kV safety busses required for component operability, 3910 volts (V).

The minimum steady state EDG voltage value of 3910 V indicated in the Surveillance Requirements of TS 3.8.1 is an analytical value that does not include measurement uncertainty. The EDG voltage is measured using test equipment or installed instrumentation, and the

appropriate uncertainty is applied via surveillance procedures. The minimum degraded voltage function allowable value of 3930.9 V indicated in TS Surveillance Requirement 3.3.5.3 includes measurement uncertainty.

Information Notice 2007-09 states that it is important that EDG surveillance procedures specify a minimum EDG steady state voltage that is greater than or equal to the calculated bus minimum voltage required for component operability. As noted above, the calculated minimum bus voltage required for component operability is 3910 V. Therefore, I&M considers the minimum EDG voltage value of 3910 V indicated in the EDG Surveillance Requirements of TS 3.8.1 to be appropriate.

NRC Question (6)

Provide justification for the basis of the TS surveillance requirements for achieving an EDG voltage of 3740 volts (V) in ≤ 10 seconds. Provide the calculation, or portions thereof, which show that the existing minimum TS-required voltages (3740 V at ≤ 10 seconds) are adequate at the instant of 10+ seconds (when first block load is connected at 10 seconds in the case of a worst-case design-basis accident).

I&M Response to NRC Question (6)

The existing Surveillance Requirements for TS 3.8.1 require that the EDGs achieve a voltage of ≥ 3740 V in ≤ 10 seconds. This requirement was originally approved for CNP in 1996 (Reference 4) based on an NRC concern that the CNP TS should be consistent with the Improved Standard TS. The requirement to achieve a voltage of ≥ 3740 V in ≤ 10 seconds was maintained in the NRC-approved 2005 transition to Improved TS (Reference 5) even though the minimum steady state voltage specified in the Surveillance Requirements for TS 3.8.1 was increased to ≥ 3910 V. The existing requirement to achieve a voltage of ≥ 3740 V in ≤ 10 seconds is consistent with the value specified in Regulatory Guide 1.9 (Reference 6) and the typical value specified in the NUREG-1431 Improved Standard TS (Reference 7). I&M considers that the existing requirement to achieve a voltage of ≥ 3740 V in ≤ 10 seconds provides adequate assurance of acceptable starting voltages for the associated safety-related loads.

However, to address the NRC concern without incurring the significant expenditure of resources involved in performing the requested calculation, I&M has elected to submit a supplement to the Reference 1 amendment request. The supplement will propose a TS change to increase the EDG voltage that must be achieved in ≤ 10 seconds from ≥ 3740 V to ≥ 3910 V. The value of ≥ 3910 V corresponds to the minimum EDG steady state voltage specified in the Surveillance Requirements for TS 3.8.1. The NRC staff indicated in a telephone call on January 15, 2008, and in an NRC electronic mail (Reference 8) dated April 15, 2008, that submittal of such an amendment request supplement would resolve the NRC concern. I&M intends to submit the supplement no later than June 30, 2008.

REFERENCES

- 1) Letter from J. N. Jensen, I&M, to NRC Document Control Desk, "Technical Specification Change of Diesel Generator Maximum Steady State Frequency," AEP:NRC:6381-05, dated June 27, 2007 (ML071910238).
- 2) Letter from P. S. Tam, NRC, to M. W. Rencheck, I&M, "D. C. Cook Nuclear Plant, Units 1 and 2 - Request for Additional Information Regarding Proposed Amendment on Emergency Diesel Generator Steady State Frequency (TAC Nos. MD5899 and MD5900)," dated November 28, 2007 (ML073190145).
- 3) Letter from P. S. Tam, NRC, to M. W. Rencheck, I&M, "D. C. Cook Nuclear Plant, Units 1 and 2 - Revised Request for Additional Information Regarding Proposed Amendment on Emergency Diesel Generator Steady State Frequency (TAC Nos. MD5899 and MD5900)," dated March 20, 2008 (ML080720021).
- 4) Letter from J. B. Hickman, NRC, to E. E. Fitzpatrick, I&M, "Donald C. Cook Nuclear Plant, Unit Nos. 1 and 2 - Issuance of Amendments Re: EDG Surveillance Testing (TAC Nos. M91864 and M91865)," dated March 11, 1996 (ML021070453).
- 5) Letter from J. Donohew, NRC, to M. K. Nazar, I&M, "Donald D.C. Cook Nuclear Plant, Units 1 and 2 - Issuance of Amendments for the Conversion to the Improved Technical Specifications with Beyond Scope Issues (TAC Nos. MC2629, MC2630, MC2653 through MC2687, MC2690 through MC2695, MC3152 through MC3157, MC3432 through MC3453)," dated June 1, 2005 (ML050620034).
- 6) NRC Regulatory Guide 1.9 , "Selection, Design, Qualification, and Testing of Emergency Diesel Generator Units Used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants," Revision 3, dated July, 1993 (ML003739929).
- 7) NRC NUREG-1431, "Standard Technical Specifications Westinghouse Plants," dated April 2001, (ML011090393).
- 8) Electronic mail from P. S. Tam, NRC, to J. R. Waters, I&M, et alia, "D. C. Cook - Request to Clarify Your RAI (TAC MD5899, MD5900)," dated April 15, 2008.