August 10, 2007

Mr. Mano K. Nazar
Senior Vice President and
Chief Nuclear Officer
Indiana Michigan Power Company
Nuclear Generation Group
One Cook Place
Bridgman, MI 49106

SUBJECT: D. C. COOK NUCLEAR PLANT, UNIT 1 (DCCNP-1) - REQUEST FOR ADDITIONAL INFORMATION REGARDING RE-ANALYSIS OF SMALL-BREAK LOSS-OF-COOLANT ACCIDENT (TAC NO. MD5297)

Dear Mr. Nazar:

In a letter dated March 29, 2007, Indiana Michigan Power Company provided a reanalysis of the small-break loss-of-coolant accident for DCCNP-1. The Nuclear Regulatory Commission (NRC) staff reviewed the information transmitted by that letter and has generated draft questions, which had been e-mailed to your staff (Accession No. ML071510338) on May 31, 2007. The NRC staff discussed the draft questions with your staff in a telephone conference on July 20, 2007. As a result of that discussion and subsequent internal deliberation, the NRC staff dropped draft Question 4, and finalized the enclosed Request for Additional Information (RAI).

Please respond within 60 days of the date of this letter. Feel free to contact me if you need clarification of this RAI.

Sincerely,

/RA/

Peter S. Tam, Senior Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-315

Enclosure:
As stated

cc: See next page

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REQUEST FOR ADDITIONAL INFORMATION

D.C. COOK NUCLEAR PLANT, UNIT 1

RE-ANALYSIS OF SMALL-BREAK LOSS-OF-COOLANT ACCIDENT (SBLOCA)

(1) Table 1 on page 9 identifies the calorimetric uncertainty as 1.0034 percent. However, the text on page 3 quotes the full power analysis value of 100.34 percent. Please explain the discrepancy. Also, please also provide the reference for the calorimetric uncertainty determination.

(2) Please provide the results of the severed emergency core cooling system (ECCS) injection line case that utilizes the degraded ECCS injection into the intact lines.

(3) Does the reduced high-pressure safety injection (HPSI) impact the timing for precipitation and the switch time to simultaneous injection? Please explain. Please also provide the boric acid vs. time for the limiting large- and small- break LOCA and identify the time to switch to simultaneous injection.

(4) Please explain the cause of the abrupt change in the core two-phase level which suddenly remains constant from 800 to 1000 seconds in Fig. 6, for the 3.25-inch break. Since this is a boil-off process, and the broken loop seal has cleared earlier, the abrupt termination of the level decrease during the boildown and uncovery period is not understood. Please provide the core inlet and outlet mass flow rates and the core liquid mass vs. time for this break.

(5) The peak cladding temperature (PCT) turns over at about 1500 seconds for the 3.25-inch break in Fig. 14, at which time the heat transfer coefficient peaks during steam cooling shown in Fig. 15. At 1800 - 2000 seconds, the heat transfer coefficient drops below the value that produced the earlier heatup from 800 to 1500 seconds, yet the clad temperature continues to decrease. Please explain.

(6) Please explain the termination in the core two-phase level for the 3-inch break from 1000 to 1300 seconds in Fig. 28 for the 3-inch break. The 2.5-inch break has a similar behavior from 1200 to 1500 seconds in Fig. 25 as does the 2.5-inch break from 1100 to 1600 seconds in Fig. 22. Please explain the abrupt deviation from the boil-down and initial rapid loss of level behavior for these breaks. The froth-up behavior for the 2.5-inch break terminates and cools the hot spot during this period and does not appear physical. Please also provide the liquid mass and core inlet flow rates vs. time for these breaks.

(7) The hot spot begins heatup at about 100 seconds in Fig. 29, when the level drops to about 21 feet. The clad heat-up is terminated at 200 seconds when the level increases from the minimum of 15 to 16 feet. Why does the PCT turn around at level of 16 feet when heat up of the hot spot begins at a level of 21 feet or less during the earlier portion of the event? How is the heat transfer at the hot spot during steam cooling calculated? Please provide the reference and briefly describe the correlations used to determine the heat transfer at the hot spot.

(8) For each break size, please identify the timing for and the location of the loop seals that clear of liquid. Please provide plots of the liquid levels in the vertical sections of the loop seals for the most limiting break.

(9) Please explain why the hot spot location at 9.5 feet does not produce the highest PCT and rupture location, since Table 5 identifies the PCT elevation as 11.75 ft, which has a local linear power level of about 6 kw/ft versus 12.5 kw/ft at 9.5 ft.

(10) Upon drainage of the refueling water storage tank, are HPSI pump flows also interrupted for 5 minutes? What is the impact of the 5-minute residual heat removal delay on the 8.75-inch break? What is the impact on the limiting large-break LOCA? Please explain.

(11) Were time step studies performed on the limiting small break? Please explain and provide the results of the time step study.

(12) Were any modifications made to the ECCS licensing models subsequent to the latest Nuclear Regulatory Commission approval and applied to the D.C. Cook SBLOCA analyses? Please identify any changes.

cc:

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