May 3, 2000

Mr. Robert P. Powers, Senior Vice President
Indiana Michigan Power Company
Nuclear Generation Group
500 Circle Drive
Buchanan, MI 49107

SUBJECT: DONALD C. COOK (DC COOK) UNITS 1 AND 2 - REVISED RESPONSE TO NRC GENERIC LETTER 97-04, “ASSURANCE OF SUFFICIENT NET POSITIVE SUCTION HEAD FOR EMERGENCY CORE COOLING AND CONTAINMENT HEAT REMOVAL PUMPS” (TAC NOS. MA8265 AND MA8266)

Dear Mr. Powers:

On October 7, 1997, the U.S. Nuclear Regulatory Commission (NRC) issued Generic Letter (GL) 97-04, “Assurance of Sufficient Net Positive Suction Head for Emergency Core Cooling and Containment Heat Removal Pumps,” to all holders of operating licenses or construction permits. By letter dated January 30, 1998, Indiana Michigan Power Company (I&M) provided a response to GL 97-04 for Donald C. Cook Nuclear Plant, Units 1 and 2. By letter dated January 7, 1999, the NRC staff informed I&M that the DC Cook GL 97-04 response was insufficient and may not represent the actual design basis of the plant. The staff concluded that I&M would have to submit a revised GL 97-04 response once the DC Cook design basis net positive suction head (NPSH) analyses have been found to be correct and sufficient. By letter dated February 4, 2000, I&M provided the revised DC Cook GL 97-04 response.

The NRC staff has reviewed the I&M letters and supporting documentation. The staff has found that the information provided in the GL 97-04 response is consistent with the design basis described in the proposed changes to the DC Cook Final Safety Analysis Report (FSAR). In all cases, I&M has shown that there is adequate NPSH margin for the safety-related emergency core cooling system (ECCS) pumps. The staff believes that I&M has provided the information requested by GL 97-04. Our evaluation is attached. This completes the NRC's effort on TAC Nos. MA8265 and MA8266. In addition, this closes Restart Action Matrix item R.3.10.

Sincerely,

/RA/

John F. Stang, 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/encls: See next page
Donald C. Cook Nuclear Plant, Units 1 and 2

cc:

Regional Administrator, Region III
U.S. Nuclear Regulatory Commission
801 Warrenville Road
Lisle, IL 60532-4351

Attorney General
Department of Attorney General
525 West Ottawa Street
Lansing, MI 48913

Township Supervisor
Lake Township Hall
P.O. Box 818
Bridgman, MI 49106

U.S. Nuclear Regulatory Commission
Resident Inspector's Office
7700 Red Arrow Highway
Stevensville, MI 49127

David W. Jenkins, Esquire
Indiana Michigan Power Company
Nuclear Generation Group
One Cook Place
Bridgman, MI 49106

Mayor, City of Bridgman
P.O. Box 366
Bridgman, MI 49106

Special Assistant to the Governor
Room 1 - State Capitol
Lansing, MI 48909

Drinking Water and Radiological Protection Division
Michigan Department of Environmental Quality
3423 N. Martin Luther King Jr Blvd
P.O. Box 30630, CPH Mailroom
Lansing, MI 48909-8130

Robert C. Godley
Director, Regulatory Affairs
Indiana Michigan Power Company
Nuclear Generation Group
One Cook Place
Bridgman, MI 49106

David A. Lochbaum
Union of Concerned Scientists
1616 P Street NW, Suite 310
Washington, DC 20036-1495

A. Christopher Bakken, Site Vice President
Indiana Michigan Power Company
Nuclear Generation Group
One Cook Place
Bridgman, MI 49106

Michael W. Rencheck
Vice President, Nuclear Engineering
Indiana Michigan Power Company
Nuclear Generation Group
500 Circle Drive
Buchanan, MI 49107
Mr. Robert P. Powers, Senior Vice President
Indiana Michigan Power Company
Nuclear Generation Group
500 Circle Drive
Buchanan, MI 49107

SUBJECT: DONALD C. COOK (DC COOK) UNITS 1 AND 2 - REVISED RESPONSE TO
NRC GENERIC LETTER 97-04, “ASSURANCE OF SUFFICIENT NET POSITIVE
SUCTION HEAD FOR EMERGENCY CORE COOLING AND CONTAINMENT
HEAT REMOVAL PUMPS” (TAC NOS. MA8265 AND MA8266)

Dear Mr. Powers:

On October 7, 1997, the U.S. Nuclear Regulatory Commission (NRC) issued Generic Letter
(GL) 97-04, “Assurance of Sufficient Net Positive Suction Head for Emergency Core Cooling
and Containment Heat Removal Pumps,” to all holders of operating licenses or construction
response to GL 97-04 for Donald C. Cook Nuclear Plant, Units 1 and 2. By letter dated
January 7, 1999, the NRC staff informed I&M that the DC Cook GL 97-04 response was
insufficient and may not represent the actual design basis of the plant. The staff concluded that
I&M would have to submit a revised GL 97-04 response once the DC Cook design basis net
positive suction head (NPSH) analyses have been found to be correct and sufficient. By letter
dated February 4, 2000, I&M provided the revised DC Cook GL 97-04 response.

The NRC staff has reviewed the I&M letters and supporting documentation. The staff has
found that the information provided in the GL 97-04 response is consistent with the design basis
described in the proposed changes to the DC Cook Final Safety Analysis Report (FSAR). In all
cases, I&M has shown that there is adequate NPSH margin for the safety-related emergency
core cooling system (ECCS) pumps. The staff believes that I&M has provided the information
requested by GL 97-04. Our evaluation is attached. This completes the NRC’s effort on TAC
Nos. MA8265 and MA8266. In addition, this closes Restart Action Matrix item R.3.10.

Sincerely,

/RA/
John F. Stang, 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/encls: See next page

Distribution:

OFFICE PD3-1/PM PD3-1/LA PD3-1/SC
NAME JStang THarris DHood for CCraig
DATE 5/2/00 5/2/00 5/3/00

ACCESSION NO. ML003710891

OFFICIAL RECORD COPY
SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE EVALUATION OF GENERIC LETTER 97-04 RESPONSE

INDIANA MICHIGAN POWER COMPANY

DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-315 AND 50-316

BACKGROUND

On October 7, 1997 (Reference 1), the U.S. Nuclear Regulatory Commission (NRC) issued Generic Letter (GL) 97-04, “Assurance of Sufficient Net Positive Suction Head for Emergency Core Cooling and Containment Heat Removal Pumps,” to all holders of operating licenses or construction permits. The GL requested that licensees provide information necessary to confirm the adequacy of the net positive suction head (NPSH) available for emergency core cooling (ECCS) and containment heat removal pumps. By letter dated January 30, 1998 (Reference 2), Indiana Michigan Power Company (I&M) provided a response to GL 97-04 for Donald C. Cook (DC Cook) Nuclear Plant, Units 1 and 2.

The NRC staff reviewed the DC Cook NPSH analyses of record for the safety related pumps. Based on the review of the DC Cook Final Safety Analysis Report (FSAR) and the NPSH analyses, the staff could not determine whether the NPSH analyses were accurate. By letter dated January 7, 1999 (Reference 3), the staff informed I&M that the DC Cook GL 97-04 response was insufficient and may not represent the actual design basis of the plant. The staff concluded that I&M would have to submit a revised GL 97-04 response once the DC Cook design basis NPSH analyses have been found to be correct and sufficient. By letter dated February 4, 2000 (Reference 4), I&M provided the revised DC Cook GL 97-04 response.

EVALUATION

The safety-related residual heat removal (RHR), containment spray, safety injection (SI), and centrifugal charging (CC) pumps take suction from the reactor water storage tank (RWST) during the injection phase following a loss-of-coolant accident (LOCA). During recirculation, the RHR and containment spray pumps take suction from the containment recirculation sumps while the SI and CC pumps take suction from the discharge of the RHR pumps. In their revised GL 97-04 response, the licensee provided the results of the NPSH analyses for both injection and recirculation for all RHR, containment spray, SI and CC pumps for both units. For DC Cook, the recirculation phase is more limiting for NPSH concerns than the injection phase. Therefore, the staff review concentrated on the recirculation phase following a LOCA.
The licensee determined the worse case assumptions for the RHR and containment spray pumps during recirculation. The licensee assumed a single-failure of one RHR pump and that the containment recirculation sump was at its minimum level of 602 feet 10 inches. For these conditions, the minimum NPSH margin, the difference between the NPSH available and the NPSH required, was reported as 7.4 feet for the Unit 2 West RHR pump. All other RHR and containment spray pumps had a higher NPSH margin.

The licensee also evaluated the worse case conditions for the SI and CC pumps during recirculation. For these calculations, the licensee assumed a single-failure of one RHR pump, a ten percent degraded head for the remaining RHR pump, and minimum level in the containment recirculation sump. For these cases, the minimum NPSH margin was reported to be 33.1 feet for the Unit 2 West CC pump.

The licensee also provided a detailed discussion of the differences between the current design-basis NPSH analyses and the most recent analyses reviewed and approved by the staff. The differences included assumptions of single-failure, ice melt, containment pressure, sump water temperature, and evaluations of valve alignments and flow rates. The current design-basis NPSH analyses include considerations of single-failures of pumps as well as a ten percent RHR pump head degradation for SI and CC pump operation in recirculation. The revised analyses also takes credit for sufficient ice melting in containment to maintain the minimum containment recirculation water level. This assumption was approved by the staff by letter dated January 2, 1998 (Reference 5). In their current analyses, the licensee assumes a containment pressure of 13.2 psia and a containment sump water temperature of 190 degrees Fahrenheit.

The staff has reviewed the DC Cook proposed FSAR changes. These changes to the FSAR are still under review at DC Cook and subject to change. However, the staff has confirmed that the information provided in the response to the GL 97-04 request, is consistent with the information provided in the proposed changes to the DC Cook FSAR. Therefore, the staff concludes that the GL 97-04 response represents the actual design basis of the plant.

CONCLUSION

The staff has reviewed the I&M revised GL 97-04 submittal and supporting documentation. The staff has found that the information provided in the GL 97-04 response is consistent with the design-basis described in the proposed changes to the FSAR. In all cases, I&M has shown that there is adequate NPSH margin for the safety-related ECCS and containment heat removal pumps. The staff believes that I&M has provided the information requested by GL 97-04.
REFERENCES


Principal Contributor: K. Kavanagh

Date: May 3, 2000