



July 28, 2000

C0700-01  
10 CFR 50.54(f)

Docket Nos.: 50-315  
50-316

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

Donald C. Cook Nuclear Plant Units 1 and 2  
RESPONSE TO GENERIC LETTER 98-02,  
"LOSS OF REACTOR COOLANT INVENTORY AND ASSOCIATED  
POTENTIAL FOR LOSS OF EMERGENCY MITIGATION FUNCTIONS  
WHILE IN A SHUTDOWN CONDITION"

Reference: I&M to NRC letter C0400-13, April 6, 2000, "Revised  
Schedule For Response To Generic Letter 98-02, Loss Of  
Reactor Coolant Inventory And Associated Potential For Loss  
Of Emergency Mitigation Functions While In A Shutdown  
Condition"

This letter provides Indiana Michigan Power Company's (I&M) response to  
Generic Letter (GL) 98-02, "Loss Of Reactor Coolant Inventory And Associated  
Potential For Loss Of Emergency Mitigation Functions While In A Shutdown  
Condition."

GL 98-02, issued May 28, 1998, required specific actions to be completed within  
180 days of the issuance of the GL. A revised date was discussed with the staff's  
project manager in a telephone conversation on March 29, 2000. It was agreed  
that I&M would respond to GL 98-02 by August 1, 2000. This revised schedule  
was documented in the above referenced letter.

GL 98-02 requested that each licensee perform an assessment of whether their  
emergency core cooling systems (ECCS) included certain design features, such  
as a common pump suction header, which could render the systems susceptible  
to common-cause failure as a result of events similar to the Wolf Creek  
Generating Station reactor coolant system (RCS) drain-down event of  
September 17, 1994. The GL also stated that if the assessment determines that

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such susceptibility exists, then the result of that assessment should be provided to the Nuclear Regulatory Commission (NRC) in writing. In addition, the GL requested that a description of the Appendix B quality assurance program features that ensure that the residual heat removal system and ECCS will not be adversely affected by activities conducted at hot shutdown be prepared and available for the NRC to verify on an as-needed or sample basis.

I&M has conducted the required assessment and concluded that Donald C. Cook Nuclear Plant is potentially susceptible to common-cause failure as a result of events similar to the Wolf Creek Generating Station RCS drain-down event. I&M has enclosed the results of the assessment in the attachment to this letter as requested.

There are no commitments included in this submittal.

Should you have any questions, please contact Mr. Brian A. McIntyre, Acting Director of Regulatory Affairs, at (616) 697-5806.

Sincerely,

A handwritten signature in black ink, appearing to read 'A. C. Bakken III', with a large, stylized circular flourish at the end.

A. C. Bakken III  
Site Vice President

\dmb

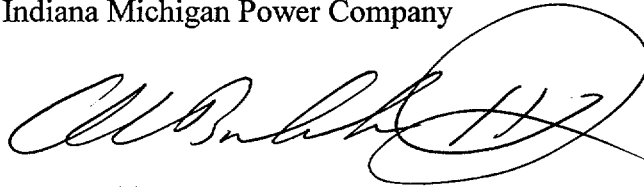
Attachment

c: J. E. Dyer  
MDEQ - DW & RPD, w/o attachment  
NRC Resident Inspector  
R. Whale, w/o attachment

**AFFIRMATION**

I, A. Christopher Bakken III, being duly sworn, state that I am 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



A. C. Bakken III  
Site Vice President

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 28 DAY OF July, 2000

  
Notary Public

My Commission Expires 05/26/05

**JENNIFER L. KERNOSKY**  
**Notary Public, Berrien County, Michigan**  
**My Commission Expires May 26, 2005**

## ATTACHMENT TO C0700-01

### Background

The Nuclear Regulatory Commission (NRC) previously issued Information Notice 95-03, "Loss of Reactor Coolant Inventory and Potential Loss of Emergency Mitigation Functions While in a Shutdown Condition," on January 12, 1995, to alert addressees to an incident at the Wolf Creek Generating Station involving the loss of reactor coolant inventory while the reactor was in a hot shutdown condition.

Generic Letter (GL) 98-02 requires that licensees perform:

"...an assessment of whether your emergency core cooling systems include certain design features, such as a common pump suction header, which can render the systems susceptible to common-cause failure as a result of events similar to the Wolf Creek RCS drain-down event of September 17, 1994."

Additionally, the GL states that:

"Addressees may limit their attention to those surveillance, maintenance, modification and operation activities at hot shutdown during which it is feasible to divert RCS fluid to the RWST, resulting in simultaneous drain-down of the RCS and voiding in the suction header for the RHR and ECC system pumps. Addressees may further limit their response to the consideration of potential configurations and conditions that involve flow paths with pipe diameters equal to or greater than 2 inches."

The GL also states that if the assessment reveals that the susceptibility exists, the results of the assessment shall be submitted to the NRC. Indiana & Michigan Power Company's (I&M) assessment revealed that Donald C. Cook Nuclear Plant (CNP) is susceptible to similar common-cause failures. The results of I&M's assessment of CNP are provided below.

### Assessment

I&M reviewed plant piping diagrams for the reactor coolant and residual heat removal (RHR) systems to assess the susceptibility of CNP's RHR and emergency core cooling system (ECCS) to common-cause failure as a result of reactor coolant system (RCS) drain down while in a hot shutdown condition. This review focused on potential flow paths which presented the possibility of returning high energy fluids to the refueling water storage tank (RWST) or specifically to a common ECCS pump suction header.

I&M identified three flow paths of concern. One flow path has the potential to return hot RCS fluid to the RWST or to the common ECCS pump suction header during hot shutdown. Two flow paths were identified that have the potential to return hot RCS to the suction of either the

centrifugal charging pumps or the safety injection (SI) pumps during hot shutdown. The three flow paths are discussed below.

**RHR Return To RWST**  
**(Reference UFSAR Figures 6.2-1A and 6.3-1)**

During decay heat removal in hot shutdown, it is possible that, with improper valve alignment, the RCS could be drained to the RWST through an 8-inch line from the RHR pump discharge. This line is used for filling and draining the RCS and refueling cavity during refueling activities. This line is normally isolated by a manual isolation valve that is sealed closed. Improper alignment of this valve during decay heat removal in hot shutdown would cause diversion of RCS fluid to the RWST via the ECCS common suction header, resulting in simultaneous drain-down of the RCS and voiding in the suction header for the RHR and ECCS pumps.

**RHR ECCS Recirculation to the Charging Pump Suction**  
**(Reference UFSAR Figures 6.2-1A and 9.2-1)**

The second flow path through which the RCS could be drained is an 8-inch line that is used as a suction supply line to the centrifugal charging pumps during the recirculation phase of a loss-of-coolant accident (LOCA). A single, normally-closed, motor operated valve (MOV) provides the required isolation of this line. The system design includes valve interlocks that would prevent accidental opening of this MOV, and the valves that provide the interlock permissive would not be positioned to allow this MOV to be opened while the RHR system was in the shutdown cooling mode of operation. In addition, this flow path would not provide a diversion flow path for fluid to the RWST or the common ECCS pump suction header. A check valve in the suction line from the RWST to the charging pump suction header would prevent fluid from flowing back into the common ECCS pump suction header. This check valve would limit the effects to potentially rendering only the charging pumps inoperable. Diversion of RCS inventory would be limited to what would pass through the 2-inch charging pump mini-flow line, a 1-inch relief valve and any fluid which would leak from the charging pump seals at potential pressures in excess of the seals' maximum design pressure.

**RHR ECCS Recirculation to the SI Pump Suction**  
**(Reference UFSAR Figures 6.2-1 and 6.2-1A)**

The third flow path through which the RCS could be drained is an 8-inch line that is used as a suction supply line to the SI pumps during the recirculation phase of a LOCA. A single, normally-closed, MOV provides the required isolation of this line. The system design includes valve interlocks that would prevent accidental opening of this MOV and the valves that provide the interlock permissive would not be positioned to allow this MOV to be opened while the RHR system was in the shutdown cooling mode of operation. This flow path would not provide a diversion flow path for fluid to the common ECCS pump suction header, but a limited diversion

of flow would be returned directly to the RWST through a 1-inch SI pump mini-flow line. A check valve in the suction line from the RWST to the SI pump suction header would prevent fluid from flowing back into the common ECCS pump suction header. This check valve would limit the effects to potentially rendering only the SI pumps inoperable. Diversion of RCS inventory would also be limited to what would pass through the 1-inch SI pump mini-flow line, a 1-inch relief valve and any fluid that would leak from the SI pump seals at potential pressures in excess of the seals' maximum design pressure.

### **Administrative Controls**

The GL also states that if susceptibility to common-cause failure as a result of events similar to the Wolf Creek Generating Station RCS drain-down event is found, licensees are required to:

"...prepare, with consideration of plant-specific design attributes, a description of the features of your Appendix B quality assurance program (for example, the methods used to verify valve position, the controls in place to assure compliance with plant surveillance, maintenance, modification and operating procedures, and the adequacy of operator training for such activities) that provide assurance that the safety-related functions of the RHR system and ECCS will not be adversely affected by activities conducted at hot shutdown (such as occurred at Wolf Creek)."

The GL states that this description need not be submitted to the NRC, but shall be kept in a retrievable licensee system that the NRC can verify on an as-needed or sample basis.

I&M has determined that controls exist at CNP to provide assurance that the safety related functions of the RHR system and ECCS would not be adversely affected by activities conducted at hot shutdown. Enhancements to these controls have been entered into the corrective action program to track their implementation. A description of these controls has been compiled and is available for review by NRC personnel.