November 27, 1998

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

SUBJECT: DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2 - ISSUANCE OF AMENDMENTS RE: REACTOR COOLANT SYSTEM - SHUTDOWN (TAC NOS. MA3799 AND MA3800)

Dear Mr. Powers:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 224 to Facility Operating License No. DPR-58 and Amendment No. 208 to Facility Operating License No. DPR-74 for the Donald C. Cook Nuclear Plant, Units 1 and 2. The amendments consist of changes to the Technical Specifications in response to your application dated October 8, 1998.

The amendments would revise the Technical Specification (TS) Section 3.4.1.3, "Reactor Coolant System - Shutdown," and its associated bases to provide separate requirements for the Reactor Coolant system in MODE 4, MODE 5 with the reactor coolant loops filled, and MODE 5 with the reactor coolant loops not filled. The proposed changes to the TS are consistent with the Standard Technical Specifications for Westinghouse plants as described in NUREG-1431.

A copy of our related Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

Original Signed by
John F. Stang, Sr. Project Manager
Project Directorate III-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-315 and 50-316

Enclosures:
1. Amendment No. 224 to DPR-58
2. Amendment No. 208 to DPR-74
3. Safety Evaluation

cc w/encls: See next page

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November 27, 1998

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Indiana Michigan Power Company
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500 Circle Drive
Buchanan, MI 49107

SUBJECT: DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2 - ISSUANCE OF AMENDMENTS RE: REACTOR COOLANT SYSTEM - SHUTDOWN (TAC NOS. MA3799 AND MA3800)

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John F. Stang, Sr. Project Manager
Project Directorate III-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-315 and 50-316

Enclosures:
1. Amendment No.224 to DPR-58
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3. Safety Evaluation

cc w/encls: See next page

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OFFICE	PM:PD31	E	LA:PD32	E	OGC		BC:SRXB*		D:PD31	E
NAME	JStang		EBarnhill		CMarco		TCollins		JCarpenter	
DATE	11/25/98		11/25/98		11/25/98		11/25/98		11/25/98	

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

November 27, 1998

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

SUBJECT: DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2 - ISSUANCE OF AMENDMENTS RE: REACTOR COOLANT SYSTEM - SHUTDOWN (TAC NOS. MA3799 AND MA3800)

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The amendments would revise the Technical Specification (TS) Section 3.4.1.3, "Reactor Coolant System - Shutdown," and its associated bases to provide separate requirements for the Reactor Coolant system in MODE 4, MODE 5 with the reactor coolant loops filled, and MODE 5 with the reactor coolant loops not filled. The proposed changes to the TS are consistent with the Standard Technical Specifications for Westinghouse plants as described in NUREG-1431.

A copy of our related Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

John F. Stang, Sr. Project Manager
Project Directorate III-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-315 and 50-316

Enclosures:
1. Amendment No. 224 to DPR-58
2. Amendment No. 208 to DPR-74
3. Safety Evaluation

cc w/encls: See next page

DATED: November 27, 1998

AMENDMENT NO. 224 TO FACILITY OPERATING LICENSE NO. DPR-58, DONALD C. COOK NUCLEAR PLANT, UNIT 1

AMENDMENT NO. 208 TO FACILITY OPERATING LICENSE NO. DPR-74, DONALD C. COOK NUCLEAR PLANT, UNIT 2

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Robert P. Powers
Indiana Michigan Power Company

cc:

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Donald C. Cook Nuclear Plant
Units 1 and 2

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

INDIANA MICHIGAN POWER COMPANY

DOCKET NO. 50-315

DONALD C. COOK NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 224
License No. DPR-58

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Indiana Michigan Power Company (the licensee) dated October 8, 1998, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

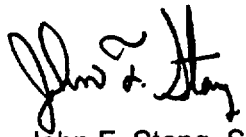
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-58 is hereby amended to read as follows:

   Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 224, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of issuance, with full implementation within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



John F. Stang, Sr. Project Manager
Project Directorate III-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: November 27, 1998

ATTACHMENT TO LICENSE AMENDMENT NO. 224

TO FACILITY OPERATING LICENSE NO. DPR-58

DOCKET NO. 50-315

Revise Appendix A Technical Specifications by removing the pages identified below and inserting the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the area of change.

REMOVE	INSERT
VI	VI
3/4 4-3	3/4 4-3
3/4 4-3a	3/4 4-3a
	3/4 4-3b
	3/4 4-3c
B3/4 4-1	B3/4 4-1

HOT SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.4.1.3 a. The coolant loops listed below shall be OPERABLE and in operation as required by items b and c:

1. Reactor Coolant Loop 1 and its associated steam generator and reactor coolant pump,*
2. Reactor Coolant Loop 2 and its associated steam generator and reactor coolant pump,*
3. Reactor Coolant Loop 3 and its associated steam generator and reactor coolant pump,*
4. Reactor Coolant Loop 4 and its associated steam generator and reactor coolant pump,*
5. Residual Heat Removal - East,
6. Residual Heat Removal - West,

b. At least two of the above coolant loops shall be OPERABLE and at least one loop in operation if the reactor trip breakers are in the open position, or the control rod drive system is not capable of rod withdrawal.**

c. At least three of the above reactor coolant loops shall be OPERABLE and in operation when the reactor trip system breakers are in the closed position and the control rod drive system is capable of rod withdrawal.

APPLICABILITY: MODE 4

---

* Operability of a reactor coolant loop(s) does not require an OPERABLE auxiliary feedwater system.

** All reactor coolant pumps and residual heat removal pumps may be de-energized for up to 1 hour provided 1) no operations are permitted that would cause dilution of the reactor coolant system boron concentration***, and 2) core outlet temperature is maintained at least 10°F below saturation temperature.

*** For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.8.b.2.

LIMITING CONDITION FOR OPERATION (Continued)

ACTION:

a. With less than the above required coolant loops OPERABLE, immediately initiate corrective action to return the required loops to OPERABLE status as soon as possible; be in COLD SHUTDOWN within 20 hours.

b. With less than the number of operating coolant loops required by item c above, restore the required number of coolant loops within 2 hours or open the reactor trip breakers.

c. With no coolant loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System*** and immediately initiate corrective action to return the required coolant loop to operation.

SURVEILLANCE REQUIREMENTS

4.4.1.3.1 The required residual heat removal loop(s) shall be determined OPERABLE per Specification 4.0.5.

4.4.1.3.2 The required reactor coolant pump(s), if not in operation, shall be determined to be OPERABLE once per 7 days by verifying correct breaker alignments and indicated power availability.

4.4.1.3.3 The required steam generator(s) shall be determined OPERABLE by verifying secondary side level to be greater than or equal to 76% of wide range instrument span at least once per 12 hours.

4.4.1.3.4 At least one coolant loop shall be verified to be in operation and circulating reactor coolant at least once per 12 hours.

*** For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.8.b.2.

COLD SHUTDOWN - LOOPS FILLED

LIMITING CONDITION FOR OPERATION

3.4.1.4 At least one residual heat removal (RHR) loop† shall be OPERABLE and in operation*, and either:

a. One additional RHR loop shall be OPERABLE**, or

b. The secondary side water level of at least two steam generators shall be greater than or equal to 76% of wide range instrument span.

APPLICABILITY: MODE 5 with reactor coolant loops filled.***

ACTION:

a. With one of the RHR loops inoperable and with less than the required steam generator water level, immediately initiate corrective action to return the inoperable RHR loop to OPERABLE status or restore the required steam generator water level as soon as possible.

b. With no RHR loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR loop to operation.

SURVEILLANCE REQUIREMENTS

4.4.1.4.1 The secondary side water level of at least two steam generators when required shall be determined to be within limits at least once per 12 hours.

4.4.1.4.2 At least one RHR loop shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

---

* The RHR pump may be deenergized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration,†† and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

** One RHR loop may be inoperable for up to 2 hours for surveillance testing provided the other RHR loop is OPERABLE and in operation.

*** A reactor coolant pump shall not be started with one or more of the Reactor Coolant System cold leg temperatures less than or equal to 152°F unless (1) the pressurizer water volume is less than 62% of span or (2) the secondary water temperature of each steam generator is less than 50°F above each of the Reactor Coolant System cold leg temperatures. Operability of a reactor coolant loop(s) does not require an OPERABLE auxiliary feedwater system.

† The normal or emergency power source may be inoperable.

†† For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.7.b.2.

COLD SHUTDOWN - LOOPS NOT FILLED

LIMITING CONDITION FOR OPERATION

3.4.1.5 At least two residual heat removal (RHR) loops† shall be OPERABLE** and at least one RHR loop shall be in operation.*

APPLICABILITY: MODE 5 with reactor coolant loops not filled.

ACTION:

a. With less than the above required RHR loops OPERABLE, immediately initiate corrective action to return the required RHR loops to OPERABLE status as soon as possible.

b. With no RHR loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR loop to operation.

SURVEILLANCE REQUIREMENTS

4.4.1.5 At least one RHR loop shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

---

* The RHR pump may be deenergized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration,†† and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

** One RHR loop may be inoperable for up to 2 hours for surveillance testing provided the other RHR loop is OPERABLE and in operation.

† The normal or emergency power source may be inoperable.

†† For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.7.b.2.

3/4.4.1 REACTOR COOLANT LOOPS

The plant is designed to operate with all reactor coolant loops in operation, and maintain DNBR above the safety analysis limit during all normal operations and anticipated transients. A loss of flow in two loops will cause a reactor trip if operating above P-7 (11 percent of RATED THERMAL POWER) while a loss of flow in one loop will cause a reactor trip if operating above P-8 (31 percent of RATED THERMAL POWER).

In MODE 3, a single reactor coolant loop provides sufficient heat removal capability for removing decay heat; however, single failure considerations require that two loops be OPERABLE. Three loops are required to be OPERABLE and to operate if the control rods are capable of withdrawal and the reactor trip breakers are closed. The requirement assures adequate DNBR margin in the event of an uncontrolled rod withdrawal in this mode.

In MODE 4, and in MODE 5 with reactor coolant loops filled, a single reactor coolant loop or RHR loop provides sufficient heat removal capability for removing decay heat; but single failure considerations require that at least two loops (either RHR or RCS) be OPERABLE. In order for an RHR loop to be OPERABLE in MODE 4, the essential service water and component cooling water systems that support it shall be OPERABLE as well.

In MODE 5 with reactor coolant loops not filled, a single RHR loop provides sufficient heat removal capability for removing decay heat; but single failure considerations, and the unavailability of the steam generators as a heat removing component, require that a least two RHR loops be OPERABLE.

The operation of one Reactor Coolant Pump or one RHR pump provides adequate flow to ensure mixing, prevent stratification and produce gradual reactivity changes during boron concentration reductions in the Reactor Coolant System. The reactivity change rate associated with boron reduction will, therefore, be within the capability of operator recognition and control.

The restrictions on starting a Reactor Coolant Pump below P-7 with one or more RCS cold legs less than or equal to 152°F are provided to prevent RCS pressure transients, caused by energy additions from the secondary system, which could exceed the limits of Appendix G to 10 CFR Part 50. The RCS will be protected against overpressure transients and will not exceed the limits of Appendix G by either (1) restricting the water volume in the pressurizer and thereby providing a volume for the primary coolant to expand into or (2) by restricting starting of the RCPs to when the secondary water temperature of each steam generator is less than 50°F above each of the RCS cold leg temperatures.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

INDIANA MICHIGAN POWER COMPANY

DOCKET NO. 50-316

DONALD C. COOK NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 208
License No. DPR-74

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Indiana Michigan Power Company (the licensee) dated October 8, 1998, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

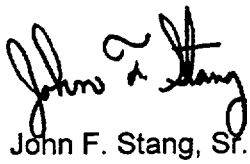
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-74 is hereby amended to read as follows:

   Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 208, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of issuance, with full implementation within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



John F. Stang, Sr. Project Manager
Project Directorate III-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: November 27, 1998

ATTACHMENT TO LICENSE AMENDMENT NO. 208

FACILITY OPERATING LICENSE NO. DPR-74

DOCKET NO. 50-316

Revise Appendix A Technical Specifications by removing the pages identified below and inserting the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the area of change.

REMOVE	INSERT
VI	VI
3/4 4-3	3/4 4-3
3/4 4-3a	3/4 4-3a
3/4 4-3b	3/4 4-3b
3/4 4-3c	3/4 4-3c
B3/4 4-1	B3/4 4-1

HOT SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.4.1.3 a. The coolant loops listed below shall be OPERABLE and in operation as required by items b and c:

1. Reactor Coolant Loop 1 and its associated steam generator and reactor coolant pump,*
2. Reactor Coolant Loop 2 and its associated steam generator and reactor coolant pump,*
3. Reactor Coolant Loop 3 and its associated steam generator and reactor coolant pump,*
4. Reactor Coolant Loop 4 and its associated steam generator and reactor coolant pump,*
5. Residual Heat Removal - East,
6. Residual Heat Removal - West

b. At least two of the above coolant loops shall be OPERABLE and at least one loop in operation if the reactor trip breakers are in the open position, or the control rod drive system is not capable of rod withdrawal.**

c. At least three of the above reactor coolant loops shall be OPERABLE and in operation when the reactor trip system breakers are in the closed position and the control rod drive system is capable of rod withdrawal.

APPLICABILITY: MODE 4

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* Operability of a reactor coolant loop(s) does not require an OPERABLE auxiliary feedwater system.

** All reactor coolant pumps and residual heat removal pumps may be de-energized for up to 1 hour provided 1) no operations are permitted that would cause dilution of the reactor coolant system boron concentration***, and 2) core outlet temperature is maintained at least 10°F below saturation temperature.

*** For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.8.b.2.

LIMITING CONDITION FOR OPERATION (Continued)

ACTION:

a. With less than the above required loops OPERABLE, immediately initiate corrective action to return the required loops to OPERABLE status as soon as possible; be in COLD SHUTDOWN within 20 hours.

b. With less than the number of operating coolant loops required by item c above, restore the required number of coolant loops within 2 hours or open the reactor trip breakers.

c. With no coolant loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System*** and immediately initiate corrective action to return the required coolant loop to operation.

SURVEILLANCE REQUIREMENTS

4.4.1.3.1 The required residual heat removal loop(s) shall be determined OPERABLE per Specification 4.0.5.

4.4.1.3.2 The required reactor coolant pump(s), if not in operation, shall be determined to be OPERABLE once per 7 days by verifying correct breaker alignments and indicated power availability.

4.4.1.3.3 The required steam generator(s) shall be determined OPERABLE by verifying secondary side level to be greater than or equal to 76% of wide range instrument span at least once per 12 hours.

4.4.1.3.4 At least one coolant loop shall be verified to be in operation and circulating reactor coolant at least once per 12 hours.

*** For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.8.b.2.

COLD SHUTDOWN - LOOPS FILLED

LIMITING CONDITION FOR OPERATION

3.4.1.4 At least one residual heat removal (RHR) loop† shall be OPERABLE and in operation*, and either:

a. One additional RHR loop shall be OPERABLE**, or

b. The secondary side water level of at least two steam generators shall be greater than or equal to 76% of wide range instrument span.

APPLICABILITY: MODE 5 with reactor coolant loops filled.***

ACTION:

a. With one of the RHR loops inoperable and with less than the required steam generator water level, immediately initiate corrective action to return the inoperable RHR loop to OPERABLE status or restore the required steam generator water level as soon as possible.

b. With no RHR loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR loop to operation.

SURVEILLANCE REQUIREMENTS

4.4.1.4.1 The secondary side water level of at least two steam generators when required shall be determined to be within limits at least once per 12 hours.

4.4.1.4.2 At least one RHR loop shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

---

* The RHR pump may be deenergized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration,†† and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

** One RHR loop may be inoperable for up to 2 hours for surveillance testing provided the other RHR loop is OPERABLE and in operation.

*** A reactor coolant pump shall not be started with one or more of the Reactor Coolant System cold leg temperatures less than or equal to 152°F unless (1) the pressurizer water volume is less than 62% of span or (2) the secondary water temperature of each steam generator is less than 50°F above each of the Reactor Coolant System cold leg temperatures. Operability of a reactor coolant loop(s) does not require an OPERABLE auxiliary feedwater system.

† The normal or emergency power source may be inoperable.

†† For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.7.b.2.

COLD SHUTDOWN - LOOPS NOT FILLED

LIMITING CONDITION FOR OPERATION

3.4.1.5 At least two residual heat removal (RHR) loops† shall be OPERABLE** and at least one RHR loop shall be in operation.*

APPLICABILITY: MODE 5 with reactor coolant loops not filled.

ACTION:

a. With less than the above required RHR loops OPERABLE, immediately initiate corrective action to return the required RHR loops to OPERABLE status as soon as possible.

b. With no RHR loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR loop to operation.

SURVEILLANCE REQUIREMENTS

4.4.1.5 At least one RHR loop shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

---

* The RHR pump may be deenergized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration,†† and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

** One RHR loop may be inoperable for up to 2 hours for surveillance testing provided the other RHR loop is OPERABLE and in operation.

† The normal or emergency power source may be inoperable.

†† For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.7.b.2.

3/4.4.1 REACTOR COOLANT LOOPS

The plant is designed to operate with all reactor coolant loops in operation, and maintain calculated DNBR above the design DNBR value during Condition I and II events. A loss of flow in two loops will cause a reactor trip if operating above P-7 (11 percent of RATED THERMAL POWER) while a loss of flow in one loop will cause a reactor trip if operating above P-8 (31 percent of RATED THERMAL POWER).

In MODE 3, a single reactor coolant loop provides sufficient heat removal capability for removing decay heat; however, single failure considerations require that two loops be OPERABLE. Three loops are required to be OPERABLE and to operate if the control rods are capable of withdrawal and the reactor trip breakers are closed. The requirement assures adequate DNBR margin in the event of an uncontrolled rod withdrawal in this mode.

In MODE 4, and in MODE 5 with reactor coolant loops filled, a single reactor coolant loop or RHR loop provides sufficient heat removal capability for removing decay heat; but single failure considerations require that at least two loops (either RHR or RCS) be OPERABLE. In order for an RHR loop to be OPERABLE in MODE 4, the essential service water and component cooling water systems that support it shall be OPERABLE as well.

In MODE 5 with reactor coolant loops not filled, a single RHR loop provides sufficient heat removal capability for removing decay heat; but single failure considerations, and the unavailability of the steam generators as a heat removing component, require that at least two RHR loops be OPERABLE.

The operation of one Reactor Coolant Pump or one RHR pump provides adequate flow to ensure mixing, prevent stratification and produce gradual reactivity changes during boron concentration reductions in the Reactor Coolant System. The reactivity change rate associated with boron reduction will, therefore, be within the capability of operator recognition and control.

The restrictions on starting a Reactor Coolant Pump with one or more RCS cold legs less than or equal to 152°F are provided to prevent RCS pressure transients, caused by energy additions from the secondary system, which could exceed the limits of Appendix G to 10 CFR Part 50. The RCS will be protected against overpressure transients and will not exceed the limits of Appendix G by either (1) restricting the water volume in the pressurizer and thereby providing a volume for the primary coolant to expand into, or (2) by restricting starting of the RCPs to when the secondary water temperature of each steam generator is less than 50°F above each of the RCS cold leg temperatures.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 224 TO FACILITY OPERATING LICENSE NO. DPR-58

AND AMENDMENT NO. 208 TO FACILITY OPERATING LICENSE NO. DPR-74

INDIANA MICHIGAN POWER COMPANY

DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-315 AND 50-316

1.0 INTRODUCTION

By letter dated October 8, 1998, the Indiana Michigan Power Company (the licensee) requested amendments to the Technical Specifications (TS) appended to Facility Operating License Nos. DPR-58 and DPR-74 for the Donald C. Cook Nuclear Plant, Units 1 and 2. The proposed amendments would revise the TS Section 3.4.1.3, "Reactor Coolant System - Shutdown," and its associated bases to provide separate requirements for MODE 4, MODE 5 with the reactor coolant loops filled, and MODE 5 with the reactor coolant loops not filled. The proposed changes will allow the steam generators to be used to remove heat from the primary coolant in MODE 5 with the reactor coolant (RC) loops filled. Currently TS 3.4.1.3 has the same requirements for MODE 4 and MODE 5. The proposed change to the TS will provide operational flexibility while in MODE 5 and provide an equivalent level of protection as the current TS. The proposed TS are consistent with the Standard Technical Specification (STS) for Westinghouse plants as described in NUREG - 1431.

2.0 EVALUATION

The licensee proposes to revise TS 3.4.1.3, "Reactor Coolant System - Shutdown" to provide separate RC loop requirements for MODE 4, MODE 5 with RC loops filled, and MODE 5 with RC loops not filled. Currently TS 3.4.1.3 has the same requirements for MODE 4 and MODE 5. The current TS do not allow operational flexibility in MODE 5 with the RC loops filled. No credit is given for decay heat removal via the SGs as is in the STS described in NUREG-1431. The current TS in MODE 5 require two residual heat removal (RHR) coolant loops to be operable with the RC loops filled. Should one RHR coolant loop become inoperable the current TS would require the starting of a reactor coolant pump (RCP) to remove decay heat. Starting an RCP will add heat to the RC loop increasing the loop temperature. Once the temperature of the RC loop exceeds 200°F, entry into MODE 4 occurs. This operation causes an unnecessary transient and challenge to safety systems. Therefore, the licensee has chosen to separate the reactor coolant system (RCS) MODE 4 and MODE 5 requirements consistent with the STS as described in NUREG-1431.

The current TS requirements for the RCS in MODE 4 will not change in the proposed TS. The only proposed change to the MODE 4 TS will be the SG percent of wide range instrument span. The evaluation of this change is discussed later in this Safety Evaluation.

Proposed TS MODE 5 Reactor Coolant Loops Filled

In MODE 5 with the RC loops filled, the primary function of the RCS is the removal of decay heat and the transfer of this heat to either the SG secondary side coolant or the component cooling water via the RHR heat exchangers. The principal means for decay heat removal is the RHR system; however, the SGs provide a redundant backup in MODE 5 with the RCS loops filled. The SGs cannot produce steam in this mode, but they provide a sufficient heat sink for heat removal because of their contained volume of secondary water.

The proposed TS has adopted the Limiting Condition for Operation (LCO), Applicability, Actions Statements and Surveillance Requirements (SR) that are consistent with the STS as described in NUREG -1431. The proposed TS LCO for MODE 5 with the RC loops filled requires at least one RHR loop to be operable and in operation and allows an option of requiring one additional RHR loop to be operable or adequate water level on the secondary side of two SGs. The proposed LCO provides for redundant paths of decay heat removal capability. The first path is an operable RHR loop in operation. The second path is either the other RHR operable loop or maintaining two SGs with adequate secondary side water level. In MODE 5 one RHR loop or two SGs with adequate water level provide adequate heat removal capability. To meet the single failure criteria the proposed LCO requires redundant heat removal paths.

Similar to the STS as described in NUREG -1431 five notes have been included in the proposed TS. The proposed notes are duplicated from the current RCS TS in MODE 5. The notes provide further clarification of plant operation and the applicability of the TS.

Proposed note * allows the RHR pump in the operable RHR loop to be deenergized for up to one hour provided: (1) no operations are permitted that would cause dilution of the RCS boron concentration, and (2) core outlet temperature is maintained at least 10°F below saturation temperature. The purpose of this note is to permit the RHR pump to be de-energized when switching operation from one RHR loop to another. The 1-hour time period is adequate to switch the RHR loops, and operational experience has shown that boron stratification is not likely during this short period of time with no forced flow if the RHR loop in operation becomes inoperable. This note is duplicated from the current TS.

Proposed note ** allows one RHR loop to be inoperable for a period of up to 2 hours, provided the other RHR loop is operable and in operation. The note allows periodic surveillance tests to be performed on the inoperable loop during the only time when such testing is safe and possible. Again, operational experience has shown that boron stratification is not likely during this short period of time with no forced flow should the RHR pump in operational RHR coolant loop become inoperable.

Proposed note *** restricts the starting of a reactor coolant pump (RCP) under certain conditions. The restriction is to prevent a low temperature overpressure event due to a thermal transient when an RCP is started. The note is duplicated from the current TS.

Proposed note † incorporates the current TS LCO for defining the power source for the RHR loop in MODE 5. The note allows an operable RHR loop power source to be either normal or emergency power. The LCO is duplicated from the existing TS.

Proposed note †† incorporates the current TS clarification note that addition of water from the refueling water storage tank does not constitute a dilution activity provided the boron concentration is greater than or equal to 2400 parts per million(ppm).

The required action statements in the proposed TS are consistent with the action statements in the STS as described in NUREG -1431. The proposed action statement requires immediate action be taken when one RHR loop or less than the required number of SGs with adequate secondary side water level is operable. The action statement requires the licensee to restore the RHR loop or the SGs to operable immediately to reestablish redundant heat removal paths. The immediate completion time in the proposed action statement reflects the importance of maintaining the availability of two paths for heat removal. In addition, the proposed TS contain an action statement that in case no RHR loops are in operation all operations involving a reduction of RCS boron concentration must be suspended and action to restore one RHR loop to operable status and put it into operation must be initiated immediately. To prevent boron dilution, forced circulation is required to provide proper mixing to maintain shut down margin. The immediate required action to restore an RHR loop to operable status reflects the importance of maintaining operation for heat removal.

The proposed TS have incorporated the SR consistent with those in the STS as described in NUREG - 1431. The proposed TS require that at least once per 12 hours the level of the water in the secondary side of the SGs be verified to be adequate. The 12-hour frequency is considered adequate in view of other indications in the control room to alert the operators to the loss of SG level.

The wide range steam generator level indication was chosen for use in this application because it provides accurate indication above the top of the tubes (the narrow range level instrumentation lower taps are located above the top of the tubes) and the wide range level instrumentation is scaled to indicate more accurately than narrow range level at lower temperatures and pressures. A wide range level indication of 76% will provide assurance that the steam generator water level is above the tubes in MODE 4 and MODE 5 (loops filled). This value bounds use of either indicators or recorders and was developed by adding the bounding normal environment indicator/recorder channel uncertainty of ± 3.1% span to the level corresponding to a water level above the top of the tubes, and provides additional margin to account for process errors and roundup.

In the licensee's preparation of the amendment a full verification of the existing RCS TS in MODE 4 was performed. The licensee discovered that the current TS value of 25% wide range SG level value was not conservative, and as stated above, the licensee has proposed to change the required SG level to 76% wide range in MODE 4.

The generic Westinghouse Owners Group (WOG) Emergency Response Guidelines, as well as NUREG-1431, define steam generator level above the top of the U-tubes in at least one steam generator as an adequate secondary side heat sink. For alternate decay heat removal, capability exists for single phase natural circulation cooling in MODES 4 and 5 if RHR cooling is lost for a prolonged period of time and secondary side inventory can be maintained as a heat sink. During natural circulation cooling with decay heat 1% or less (as anticipated in MODE 4 and MODE 5), most of the energy removal in the "active" steam generators occurs near the tube sheet. Thus, the minimum steam generator wide range level requirement could be defined to be a lower value and still allow adequate decay heat removal. Specification of a level above the top of the tubes is, therefore, considered a conservative requirement for this TS.

In addition, the proposed TS requires verification that at least one RHR loop is operating and circulating RC. Verification includes flow rate, temperature, or pump status monitoring, which helps ensure that forced flow is providing heat removal. The 12-hour frequency similar to SG water level verification is adequate because of the other indications and alarms available to the operators in the control room to monitor RHR loop performance.

The licensee has administrative procedures requiring verification once per 8-hour shift that the bus powering the operable but non-operating RHR pump is energized. Also the correct breaker alignment and indication that power is available to the pump is verified once every 7 days.

Reactor Coolant Loops Not Filled

In MODE 5 with the reactor coolant loops not filled, the steam generators are not available as a heat-removing component. Although a single RHR loop provides sufficient heat removal capability for removing decay heat, single failure considerations require both RHR loops to be operable. Maintaining two operable RHR loops ensures that an accidental boron dilution event can be mitigated, and adequate heat removal is maintained.

The proposed TS for the RCS with the loops not filled have adopted LCO, Applicability, Action Statements and SR consistent with STS described in NUREG-1431. All current TS requirements and notes have been incorporated into the proposed TS in a format similar to the STS as described in NUREG -1431. The proposed TS provides clarity because it applies only in MODE 5 with the reactor coolant loops not filled.

The proposed LCO require two RHR loops to be operable with at least one loop in operation. While one RHR loop is sufficient for heat removal in MODE 5, the proposed LCO requires the second loop to be operable to meet single failure criteria.

The proposed applicability, action statements and SR are identical to those proposed for the RCS with the RC loops filled. In this mode, the SGs are not used to remove decay heat, and therefore, no reference is made to them or the use of a RCP.

In preparation of the TS, the licensee evaluated their responses to NRC Generic Letter 88-17, "Loss of Decay Heat Removal," or Generic Letter 87-12, "Loss of RHR While RCS Partially Filled." It was determined that the proposed TS did not impact the responses. These generic letters are related to the proposed requirements for MODE 5 with the loops not filled. The

proposed requirements ensure that the risk associated with reduced RHR inventory is minimized.

3.0 Summary

The licensee has proposed to change TS Section 3.4.1.3, "Reactor Coolant System - Shutdown," and its associated bases to provide separate requirements for MODE 4, MODE 5 with the reactor coolant loops filled, and MODE 5 with the reactor coolant loops not filled. The proposed TS have adopted the format and all requirements from the STS as described in NUREG - 1431. All current TS requirements have been incorporated into the proposed TS.

The proposed TS ensure that systems are available to mitigate the postulated accidents in MODE 5, which include a dilution accident. There are no changes to accident initiators or precursors, or to the accident analyses. The proposed TS provide reasonable assurance that decay heat is removed as designed and that redundancy is maintained. The TS will allow the steam generators to be used to remove heat from the primary coolant in MODE 5 with the RC loops filled. This is consistent with the STS as described in NUREG - 1431. The proposed TS provide operational flexibility while in MODE 5 and provide an equivalent level of protection as the current TS.

Based on the above evaluation, the staff finds the proposed changes to the TS are acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Michigan State official was notified of the proposed issuance of the amendments. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

These amendments change the requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change the surveillance requirements. The staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration and there has been no public comment on such finding (63 FR 57322). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the

Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: John Stang

Date: November 27, 1998

AMENDMENT ROUTING SHEET
PROJECT DIRECTORATE III-3

SRP Section Chapter 5 5.2.5

Utility Name Indiana Michigan Power Co **TAC Nos.** MA3799 / MA3800
Subject Reactor Coolant System Shutdown

Application Date October 8, 1998

1. E. Barnhill EEB	Licensing Assistant	concur 11/24/98
2.	Project Manager *	concur
3.	Tech Spec Branch	concur
4. SRXB	Technical Branch	concur
5. OGC	(SRP#)	concur
6.	Project Manager **	sign / ☎ call state
7.	Project Director **	concur/sign

* SE Prepared By: Technical Branch ☒ Project Manager ☐ (check one)

E. Barnhill ***	Amdt No(s). 224 & 208 Date 11/27/98
Secretary	Insert Amendment No(s). and Date
E. Barnhill	QA Amdt Package / TS pgs checked ( )
Secretary	Dispatch (return Bkground/Incoming to LA)

Initial Determination:
Significant Hazards Consideration
No Significant Hazards Consideration
No Initial Determination Made

Notice Published: October 27, 1998 (63 FR 57322) (biweekly / individual)
Notice Period 30 (days) ***Notice Period Expires*** _____
If less than 30 days or hearing request is received prepare Final No Significant Hazards Consideration Determination ***EXIGENT / EMERGENCY***
BiWeekly / Individual Notice notice of issuance enclosed.

** ***Date*** PM consulted w/State 11/25/98 Comments: Yes ☐ No ☐
- Considered others impacted by staff action (2.206 petitions, open allegations, congressional or public inquiries, significant enforcement actions, inspection activities, Commission policies, staff positions, Owners Group activities): yes ☒ no ☐ Initial: PM JFS PD _____
- Communicated w/identified stakeholder(s): yes ☒ no ☐ Initial: PM JFS PD _____
- Considered appropriateness of assessment of exceptionally good or weak licensee performance: Initial PM JFS PD _____

*** ***Date*** LA checked w/SECY (415-1966) 11/27/98 ***Petitions*** Yes/No
Date LA checked w/ADMN (415-6862/63) 11/27/98 ***Comments*** Yes/No

CONTACT: Edith Barnhill(EEB), Licensing Assistant (415-1379) MS O-13 E21