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

October 9, 2013

Mr. Lawrence J. Weber
Senior Vice President and
Chief Nuclear Officer
Indiana Michigan Power Company
Nuclear Generation Group
One Cook Place
Bridgman, MI 49106

SUBJECT: DONALD C. COOK NUCLEAR PLANT, UNIT 1 - ISSUANCE OF AMENDMENT RE: REVISION TO TECHNICAL SPECIFICATION 3.6.9, "DISTRIBUTED IGNITION SYSTEM (DIS)" (EMERGENCY CIRCUMSTANCES) (TAC NO. MF2887)

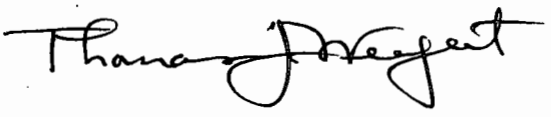
Dear Mr. Weber:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 321 to Renewed Facility Operating License No. DPR-58 for the Donald C. Cook Nuclear Plant, Unit 1. The amendment revises Technical Specification (TS) 3.6.9, "Distributed Ignition System (DIS)," to allow Train B of the DIS to be considered operable with two inoperable ignitors. The existing TS defines train operability as having no more than one ignitor inoperable. The amendment also allows one of five specific primary containment regions to have zero ignitors operable. The existing TS requires that at least one ignitor be operable in each region. The proposed TS revision is applicable until the fall 2014 refueling outage, or until the next entry into MODE 3. This is in response to your application dated October 7, 2013, as supplemented by letters dated October 8, and October 9, 2013

Due to the time critical nature, the license amendment is issued under emergency circumstances as provided in the provisions of paragraph 50.91(a)(5) of Title 10 of the *Code of Federal Regulations* due to the time critical nature of the amendment. In this instance, an emergency situation exists in that the proposed amendment is needed to allow the licensee to preclude a plant shutdown.

A copy of the related Safety Evaluation (SE) is enclosed. The SE describes the emergency circumstances under which the amendment was issued and the final no significant hazards determination. A Notice of Issuance addressing the final no significant hazards determination and opportunity for a hearing associated with the emergency circumstances, will be included in the Commission's next regular biweekly *Federal Register* notice.

Sincerely,



Thomas J. Wengert, Senior Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-315

Enclosures:
1. Amendment No. 321 to DPR-58
2. Safety Evaluation

cc w/encls: Distribution via ListServ

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 RENEWED FACILITY OPERATING LICENSE

Amendment No. 321
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 7, 2013, as supplemented by letters dated October 8, and October 9, 2013, 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 Renewed Facility Operating License No. DPR-58 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A and Appendix B, as revised through Amendment No. 321, are hereby incorporated in the renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 1 day of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert D. Carlson, Chief
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Operating
License No. DPR-58 and Appendix A

Date of Issuance: October 9, 2013

ATTACHMENT TO LICENSE AMENDMENT NO. 321

TO RENEWED FACILITY OPERATING LICENSE NO. DPR-58

DOCKET NO. 50-315

Replace the following page of Renewed Facility Operating License No. DPR-58 with the attached revised page. The change area is identified by a marginal line.

REMOVE	INSERT
- 3 -	- 3 -

Replace the following pages of Appendix A, Technical Specifications, with the attached revised pages. The changed areas are identified by marginal lines.

REMOVE	INSERT
3.6.9-1	3.6.9-1
3.6.9-2	3.6.9-2

and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

(4) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument and equipment calibration or associated with radioactive apparatus or components; and

(5) Pursuant to the Act and 10 CFR Parts 30 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

The licensee is authorized to operate the facility at steady state reactor core power levels not to exceed 3304 megawatts thermal in accordance with the conditions specified herein.

(2) Technical Specifications

The Technical Specifications contained in Appendix A, and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 321 are hereby incorporated in this license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(3) Less than Four Loop Operation

The licensee shall not operate the reactor at power levels above P-7 (as defined in Table 3.3.1-1 of Specification 3.3.1 of Appendix A to this renewed operating license) with less than four reactor coolant loops in operation until (a) safety analyses for less than four loop operation have been submitted, and (b) approval for less than found loop operation at power levels above P-7 has been granted by the Commission by amendment of this license.

(4) Indiana Michigan Power Company shall implement and maintain, in effect, all provisions of the approved Fire Protection Program as described in the Final Safety Analysis Report for the facility and as approved in the SERs dated December 12, 1977, July 31, 1979, January 30, 1981, February 7, 1983, November 22, 1983, December 23, 1983, March 16, 1984, August 27, 1985,

3.6 CONTAINMENT SYSTEMS

3.6.9 Distributed Ignition System (DIS)

LCO 3.6.9 Two DIS trains shall be OPERABLE. (See footnote 1)

AND

Each containment region shall have at least one OPERABLE hydrogen ignitor. (See footnote 2)

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One DIS train inoperable. (See footnote 1)	A.1 Restore DIS train to OPERABLE status. OR A.2 Perform SR 3.6.9.1 on the OPERABLE train.	7 days Once per 7 days
B. One containment region with no OPERABLE hydrogen ignitor. (See footnote 2)	B.1 Restore one hydrogen ignitor in the affected containment region to OPERABLE status.	7 days
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	6 hours

Footnote 1: For the remainder of Fuel Cycle 25, or until the next entry into MODE 3, DIS Train B may be considered OPERABLE with two lower containment Phase 3 Power Supply ignitors inoperable.

Footnote 2: For the remainder of Fuel Cycle 25, or until the next entry into MODE 3, one of the following regions is allowed to have no OPERABLE ignitor: Region 12, 13, 14, 15, or 16.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.9.1	Energize each DIS train power supply breaker and verify ≥ 34 ignitors or ≥ 33 ignitors if allowed by footnote 1 are energized in each train.	184 days (See footnote 3)
SR 3.6.9.2	Verify at least one hydrogen ignitor is OPERABLE in each containment region. (See footnote 2)	184 days (See footnote 3)
SR 3.6.9.3	Energize each hydrogen ignitor and verify temperature is ≥ 1700°F. (See footnote 1)	24 months

Footnote 1: For the remainder of Fuel Cycle 25, or until the next entry into MODE 3, DIS Train B may be considered OPERABLE with two lower containment Phase 3 Power Supply ignitors inoperable.

Footnote 2: For the remainder of Fuel Cycle 25, or until the next entry into MODE 3, one of the following regions is allowed to have no OPERABLE ignitor: Region 12, 13, 14, 15, or 16

Footnote 3: For the remainder of Fuel Cycle 25, or until the next entry into MODE 3, DIS Train A and Train B will be tested on a staggered basis, such that one Train is tested every 92 days starting with the first staggered test to be performed 92 days after the surveillance performed on October 4, 2013.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 321

TO RENEWED FACILITY OPERATING LICENSE NO. DPR-58

INDIANA MICHIGAN POWER COMPANY

DONALD C. COOK NUCLEAR PLANT, UNIT 1

DOCKET NO. 50-315

1.0 INTRODUCTION

By letter dated October 7, 2013, as supplemented by letters dated October 8, and October 9, 2013, Indiana Michigan Power Company (I&M, the licensee) requested an emergency amendment to Renewed Facility Operating License No. DPR-58 for the Donald C. Cook Nuclear Plant, Unit 1 (CNP-1). The proposed change will modify Technical Specification (TS) 3.6.9 for the Distributed Ignition System (DIS). The existing TS requires at least 34 of 35 hydrogen ignitors per train to be operable and that each containment region have at least one operable hydrogen ignitor. Recent surveillance data indicates that three hydrogen ignitors are inoperable. The licensee has two ignitors in Train B that are currently inoperable, rendering that train inoperable. In addition, one of the inoperable ignitors is in Train A in the same Phase (Phase 3) as the Train B ignitors, indicating that one containment region may have zero operable ignitors. The existing TS requires that at least one hydrogen ignitor is operable in each containment region.

The proposed amendment will allow the DIS Train B to be considered operable with two of 35 ignitors inoperable and will allow one of five containment regions to have no operable ignitors. The proposed TS would remain applicable until the fall 2014 refueling outage or until the next entry into MODE 3 (Hot Standby).

The licensee stated that it may not be possible to repair or replace any ignitors in any of the 5 potentially affected containment regions with the unit in MODE 1 (Power Operation) due to significant radiation and safety hazards to personnel.

2.0 REGULATORY EVALUATION

2.1 Applicable Regulatory Requirements and Review Criteria

The U.S. Nuclear Regulatory Commission's (NRC's) regulatory requirements related to the content of the TSs are set forth in Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.36, "Technical specifications." This regulation requires that the TSs include items in five specific categories. These categories include: (1) safety limits, limiting safety system settings,

and limiting control settings; (2) limiting condition for operations (LCOs); (3) surveillance requirements (SRs); (4) design features; and (5) administrative controls. This amendment request concerns changes to an LCO and SRs.

The regulations in 10 CFR 50.44(b)(2)(ii), require all pressurized-water reactors with ice condenser containments to have the capability for controlling combustible gas generated from a metal-water reaction involving 75 percent of the fuel cladding surrounding the active fuel region so that there is no loss of containment structural integrity. This requirement exists to ensure that the containment integrity is preserved during a significant beyond design basis accident, and is coupled with the 10 CFR 50.44(c)(1) requirement that the capability exists for ensuring a mixed atmosphere during design basis and significant beyond design basis accidents.

Appendix A to 10 CFR Part 50, "General Design Criteria for Nuclear Power Plants," Criterion 41, "Containment atmosphere cleanup," provides a requirement for systems to control fission products, hydrogen, oxygen, and other substances which may be released into the reactor containment. The concentrations of hydrogen or oxygen and other substances in the containment atmosphere following postulated accidents are to be controlled to assure containment integrity is maintained.

NUREG-0800, Standard Review Plan, 6.2.5, "Combustible Gas Control in Containment," provides guidance for acceptance criteria to meet the relevant requirements of the NRC's regulations, specifically 10 CFR 50.44.

2.2 Applicable Precedents

Precedents for this proposed change exist, such as Watts Bar Nuclear Plant, Unit 1, Amendment No. 10, dated June 9, 1998 (ADAMS Accession No. ML020800059), the Catawba Nuclear Station, Unit 2, Amendment No. 178, dated May 5, 2000 (ADAMS Accession No. ML003713019), and the CNP Unit 2, Amendment No. 294, dated February 4, 2010 (ADAMS Accession No. ML100310038). The three precedent amendments were approved based, in part, on the operability of the remaining ignitors, and conditions that precluded the formation of detonable concentrations.

3.0 TECHNICAL EVALUATION

3.1 Background

The existing TS 3.6.9 requires ≥34 ignitors to be operable for a given train of distributed ignitors to be operable. The licensee has 7 days to restore a DIS train to an operable status or to perform SR 3.6.9.1 on the operable train once every 7 days to meet the LCO.

The proposed amendment will add three footnotes to TS 3.6.9. The footnotes will read:

1. For the remainder of Fuel Cycle 25, or until the next entry into MODE 3, DIS Train B may be considered OPERABLE with two lower containment Phase 3 Power Supply ignitors inoperable.

2. For the remainder of Fuel Cycle 25, or until the next entry into MODE 3, one of the following regions is allowed to have no OPERABLE ignitor: Region 12, 13, 14, 15, or 16.

3. For the remainder of Fuel Cycle 25, or until the next entry into MODE, DIS Train A and Train B will be tested on a staggered basis, such than one Train is tested every 92 days starting with the first staggered test to be performed 92 days after the surveillance performed on October 4, 2013.

Reference to footnotes 1 and 2 will be added to TS LCO 3.6.9. Reference to footnote 1 will be added to TS 3.6.9 ACTION CONDITION A. and SURVEILLANCE REQUIREMENTS SR 3.6.9.1 and SR 3.6.9.3. Reference to footnote 2 will be added to TS 3.6.9 ACTION CONDITION B. and SURVEILLANCE REQUIREMENT SR 3.6.9.2. Reference to footnote 3 will be added to TS 3.6.9 SURVEILLANCE REQUIREMENTS FREQUENCY for SR 3.6.9.1 and SR 3.6.9.2.

A parenthetical statement, "or ≥33 ignitors if allowed by footnote 1," will be added to SR 3.6.9.1 to energize each DIS train and verify ≥34 ignitors are energized in each train.

3.2 Description of System/Component and Current Requirements

Following a major loss-of-coolant accident (LOCA), hydrogen may be generated inside the containment by the following mechanisms: (1) metal-water reaction of the zirconium clad at high temperatures; (2) chemical corrosion of materials with the alkaline containment spray; and (3) radiation-induced decomposition of water in the core and sump. During a LOCA, the dissolved hydrogen within the reactor coolant and pressurizer steam space is another contributing factor to hydrogen within containment. The function of the DIS is to assure adequate hydrogen control capacity during a degraded core-cooling event. The distribution of the ignitor assemblies throughout the containment promotes combustion of lean hydrogen/air/steam mixtures.

The DIS is designed to meet 10 CFR 50.44 requirements for a system to reduce the hydrogen concentration in the primary containment following a degraded core accident. The quantity of hydrogen released from the reaction of the fuel cladding with water during the beyond-design basis accident is much greater than the hydrogen release calculated for a DBA. The DIS is required to handle the amount of hydrogen equivalent to that generated from a metal water reaction involving 75 percent of the fuel cladding. The DIS is designed to minimize the potential accumulation of hydrogen and preclude detonations of the hydrogen. The DIS is based on the concept of controlled ignition using thermal ignitors, designed to be capable of functioning in a post-accident environment. The DIS depends on the dispersed location of the ignitors so that local pockets of hydrogen at increased concentrations would burn before reaching a hydrogen concentration significantly higher than the lower flammability limit.

CNP has a Containment Air Recirculation/Hydrogen Skimmer System (CEQ). It consists of two redundant independent systems, which include fans, back draft dampers, valves, piping, and ductwork. The system includes provisions for providing both 1) general recirculation of containment atmosphere between the upper and lower compartments following a LOCA, and 2) preventing the accumulation of hydrogen in restricted areas within the containment following a LOCA and ensuring a mixed atmosphere during design-basis and significant beyond design-basis accidents.

The potential areas of hydrogen pocketing are the top of the containment dome, and the lower compartment enclosures, which include the three rooms in the annular space between the crane wall and the liner, the steam generator enclosures, and the pressurizer enclosure. Hydrogen pocketing is prevented by the CEQ system continuously drawing air out of the top of each of the above areas at such a rate as to limit the potential local hydrogen concentration to

less than 4 percent by volume when coupled with the operation of the DIS. With this arrangement relatively small local areas of higher concentration would be ignited consuming the hydrogen in a serial fashion over time where the heating and pressure effects would be within the capability of containment and other containment systems and preventing much larger hydrogen accumulations and concentrations that could result in detonation or combustion events that could compromise containment.

The DIS consists of two trains with 35 ignitors per train. Each train consists of two groups. One group of 17 ignitors serves the general lower volume area of containment while the other group of 18 ignitors serves the upper volume area of containment. The ignitors are supplied power in "strings." Each string consists of four to seven ignitors and is powered by one phase of a three-phase power supply. The ignitors are located such that each containment region has at least two ignitors, and at least one ignitor from each train. When energized, the ignitor element heats up to a surface temperature ≥1700°F, well in excess of that needed to ignite a combustible mixture of hydrogen and air.

Technical Specification SR 3.6.9.1 requires each DIS train power supply be energized to verify that ≥34 ignitors are drawing electrical current in each train. The surveillance is performed once every 184 days. Due to accessibility concerns in MODE 1, electrical current readings in lieu of direct observation are used to verify the ignitors are energized.

When TS SR 3.6.9.1 was performed on October 4, 2013, low electrical current readings were identified on the Train B lower ignitor string powered from phase 3 and the Train A lower ignitor string powered from phase 3. This indicated the failure of two ignitors on the Train B phase 3 string and one ignitor on the Train A phase 3 ignitor string. Since the acceptance criterion for train operability is ≥34 ignitors, the results of the surveillance test rendered Train B inoperable. The resulting action statement requires either restoration of the inoperable DIS train to operable status within 7 days or to perform SR 3.6.9.1 on the operable train once every 7 days.

The licensee stated that the failed ignitors could not be replaced at power without exposing personnel to significant radiation and safety hazards. The licensee also expressed concern that the required weekly thermal cycling of the operable train (Train A) will shorten the operating life of the ignitors and may cause an additional ignitor failure or failures before the end of the fuel cycle. The licensee estimates the weekly performance of TS SR 3.6.9.1 on the DIS Train A between now and the end of the current fuel cycle will cycle the ignitors 52 times versus a normal frequency of two times during the remaining fuel cycle.

Failure of one more ignitor on Train A or inoperability of the Train A emergency electrical system with the Train B DIS inoperable will require entry into an LCO 3.0.3 shutdown. Thus, the inoperability of DIS Train B provides an increased risk of a CNP-1 shutdown in accordance with LCO 3.0.3. In addition, it is more likely than not that one of the containment lower regions has both igniters inoperable placing the unit in a 7 day action statement.

The licensee has determined that DIS Train B can continue to perform its safety function even with two ignitors in the lower containment string powered by phase 3 inoperable. Similarly DIS Train A can continue to perform its safety function with one ignitor in the lower containment string powered by phase 3 inoperable. The proposed changes would preclude DIS Train B from being declared inoperable and the DIS system inoperable with one lower containment region without a functioning ignitor. This current entry into the 7 day action completion time requirement adds the additional risk of shutting down unit 1 while unit 2 is in a refueling outage.

In its supplemental information letter dated October 8, 2013, the licensee stated that in November of 2012, as a result of a corrective action evaluation for a failed DIS ignitor, a modification was initiated as a needed corrective action to improve long-term reliability of the DIS ignitors. The licensee noted that the modification was initially scheduled for installation during the Unit 1 refueling outage scheduled for the fall of 2014, as there was insufficient time to develop and plan the modification for installation in the Unit 1 refueling outage during the spring of 2013. The new ignitors will be of a different design and are expected to exhibit much improved reliability with better tolerance of the thermal cycles from the required surveillance testing.

3.3 NRC Staff Evaluation

The licensee stated that the function of the DIS is to assure adequate hydrogen control capacity during a degraded core cooling event. The distribution of the ignitor assemblies throughout the containment promotes combustion on lean hydrogen/air/steam mixtures. The existence and operation of the CEQ System provides assurance that the air in containment is well mixed. Direct ignition of hydrogen within an area is not required to burn the hydrogen at low concentrations. Hydrogen burns ignited in one compartment can readily propagate into adjacent compartments when the hydrogen concentration in the adjacent compartment exceeds the propagation limit. Propagation limits are lower than the ignition limits (Reference NUREG/CR-4993, "A Standard Problem for HECTR-MAAP Comparison: Incomplete Burning.").

The effects of flame propagation were not discussed in the hydrogen combustion analyses performed for CNP using the MAAP3.0B computer code to demonstrate the ability of the hydrogen control system to mitigate the consequences of the release of hydrogen into containment during postulated degraded core accidents. However, the licensee relied upon a report, "An Analysis of Hydrogen Control Measures at McGuire Nuclear Station," submitted by Duke Energy Company (DEC) to the NRC staff in August 1993 to determine the effects of burn propagation at CNP. The report was referenced in a DEC submittal dated May 3, 2000, in support of a Catawba Nuclear Station, Unit 2 proposed TS amendment, which was approved by the NRC staff on May 5, 2000. The DEC submittal states that the analysis clearly shows that propagation of burns between compartments is effective for initiating burns within compartments that have not yet reached the hydrogen concentration ignition limit. Based on the level of detail used in containment modeling, the licensee stated that the CNP and Catawba containment arrangements are similar and the conclusions in the report regarding flame propagation are applicable to CNP.

The CEQ System will provide a well-mixed environment preventing the accumulation of pockets of hydrogen. Ignition in any compartment is likely to result in combustion in every compartment that has accumulated hydrogen mixture at the propagation limit. With the lower containment as the region most likely to see the hydrogen source term, ignition occurs frequently in this compartment and would spread readily to the dead-end compartments (such as steam generator or pressurizer enclosures).

DIS lower containment Phase 3 Power Supply ignitor string has multiple ignitors in each region (steam generator and the pressurizer cubicles) and adjacent regions providing assurance that hydrogen ignition will occur and will propagate as a local deflagration burn before a high hydrogen concentration could be present in a large volume of the containment. Were one region not to have an operable ignitor the operation of the CEQ will maintain the hydrogen concentration in these areas at a low level precluding the formation of detonable pockets. Hydrogen ignition in the general area of the lower containment volume or in an adjacent steam

generator or pressurizer cubical will provide propagation of a flame front to the cubical with the inoperable ignitors.

Regulatory guidance documents such as the Standard Review Plan and associated Regulatory Guides do not provide specific criteria regarding the locations of hydrogen ignitors in those containments using ignitor systems to comply with 10 CFR 50.44 requirements. The ignitor locations in ice condenser facilities have been selected with a view toward providing coverage near hydrogen sources and in compartments where hydrogen could accumulate in both high locations and low locations. High locations have been included to account for the possibility of hydrogen pocketing at high points due to buoyancy. Low locations have been included to take advantage of upward burning in leaner mixtures. Ignitor coverage is also provided in areas where low-concentration hydrogen mixtures could be rapidly concentrated into combustible mixtures due to ice or spray cooling effects (e.g., upper plenum of ice condenser). Both expert judgment and analysis were used in the ignitor location selection process. Therefore, the NRC staff concludes that, with ≥34 operable ignitors in Train A and ≥33 operable ignitors in Train B, compliance with 10 CFR 50.44(b)(2)(ii) will be maintained.

3.4 Summary

Based on the foregoing evaluation, the NRC staff concludes that the DIS will continue to provide adequate protection against the adverse effects of hydrogen combustion following a degraded core-cooling beyond design basis event, despite the inoperability of two ignitors in the DIS Train B and one ignitor in Train A. The operation of the CEQ System will mitigate the collection of hydrogen in pockets that could lead to detonation or large volume burns. The remaining hydrogen ignitors will permit the controlled ignition of hydrogen at low concentrations. Therefore, the NRC staff finds the proposed TS changes to be acceptable.

4.0 EMERGENCY CIRCUMSTANCES

4.1 Background

Section 50.91 of 10 CFR Part 50 provides special exceptions for the issuance of amendments when the usual 30-day public notice cannot be met. Specifically, 10 CFR 50.91(a)(5) provides that where the NRC finds that an emergency situation exists, in that failure to act in a timely way would result in the derating or shutdown of a nuclear power plant, it may issue a license amendment involving no significant hazards consideration without prior notice and opportunity for a hearing or public comment. In this situation, the NRC will publish a notice of issuance under 10 CFR 2.106, providing for opportunity of a hearing and for public comment after issuance.

As discussed in the licensee's application dated October 7, 2013, as supplemented by letters dated October 8, and October 9, 2013, the licensee requested that the NRC process the proposed amendment on an emergency basis in accordance with the provisions of 10 CFR 50.91(a)(5).

In Enclosure 2 to the letter dated October 7, 2013, the licensee provided a description of the failed surveillance testing that led to the subsequent request for emergency approval of the proposed TS change:

> When TS Surveillance Requirement 3.6.9.1 was performed on October 4, 2013, acceptable current readings were obtained for all Train A and Train B upper

> ignitors and all Train A and Train B lower ignitor strings powered by Phase 1 and Phase 2. However, low current readings were obtained for both Train A and Train B lower ignitor strings powered by Phase 3. The readings indicated that one ignitor in the Train A string powered by phase 3 and two ignitors in the Train B string powered by Phase 3 had failed. Radiation and high temperature hazards precluded access that would allow visual observation or repair of all Train A and Train B lower ignitors in strings powered by Phase 3, except for Train A Phase 3 ignitor A35. Therefore, two Train B ignitors (B30, B31, B32, B33, or B34) in the lower containment string powered by Phase 3 are considered to have failed, and one Train A ignitor (A30, A31, A32, A33, A34 or A35) in the lower containment string powered by Phase 3 is considered to have failed.
>
> With two DIS Train B ignitors inoperable, the number of operable ignitors in Train B is less than the minimum of 34 ignitors required by TS Surveillance Requirement 3.6.9.1. Therefore, LCO 3.6.9 Condition A was entered. The Required Action for this Condition is to restore the inoperable DIS train to operable status within 7 days or perform TS Surveillance Requirement 3.6.9.1 on the operable DIS train at least once per 7 days. With one DIS Train A ignitor inoperable in the same Phase 3 string as the two Train B inoperable ignitors, it cannot be verified that each containment region has at least one operable hydrogen ignitor as required by TS Surveillance Requirement 3.6.9.2. Therefore, LCO 3.6.9 Condition B was entered. The Required Action for this Condition is to restore one hydrogen ignitor in the affected containment region to operable status within 7 days. At the expiration of the Condition B Completion Time of 7 days, Condition C would be entered. The Required Action for this Condition is to be in MODE 3 within 6 hours.

In its October 7, 2013, application, the licensee stated that, to assure that failures do not recur, I&M plans to perform a modification to the DIS design required ratings. The licensee added that the modification is planned to be installed in CNP-1 during the next refueling outage (fall 2014), with the replacement of all Unit 1 hydrogen ignitors. In its October 8, 2013, response to the NRC staff's request for additional information, the licensee stated the following concerning the planned modification:

> In November 2012, as a result of a corrective action evaluation for a failed DIS ignitor, the modification was identified as a corrective action to improve the long-term reliability of the DIS ignitors. The modification was initially scheduled to be installed during the Unit 1 Cycle 26 refueling outage which is scheduled for the Fall of 2014. The Unit 1 Cycle 25 refueling outage occurred in the Spring of 2013 which did not allow sufficient time for the modification to be developed, planned, and installed during that outage. Therefore this modification has not been previously deferred from an outage.

As discussed in its October 7, 2013, application, I&M requested that the proposed amendment be processed by the NRC on an emergency basis in accordance with the provisions in 10 CFR 50.91(a)(5). The licensee stated that the emergency circumstances could not be avoided since the discovery of two inoperable ignitors in the string powered by lower DIS Train B Phase 3 and one inoperable ignitor in the string powered by lower DIS Train A Phase 3 on October 4, 2013, could not have been foreseen in sufficient time to allow the 30 day public comment period specified in 10 CFR 50.91(2)(ii). The licensee further noted that the electrical circuit design and physical location of the affected ignitor strings in areas of significant radiation and high

temperature may preclude repairing the ignitors or even identifying which ignitors are inoperable. In addition, the licensee provided several probable occurrences that could result in a unit shutdown due to the current inoperability of the DIS Train B.

4.2 NRC Staff Conclusion

The NRC staff has reviewed the circumstance leading to the need for requesting this amendment on an emergency basis and concludes that an exigent condition exists in that failure to act in a timely manner could result in a shutdown of CNP-1. The NRC staff has considered the licensee's reasoning for failing to file an application sufficiently in advance to preclude an emergency amendment, and concludes that the licensee notified the staff of the deficiency in a reasonable time and proposed this amendment to remedy the situation. Therefore, the staff concludes that the licensee has not abused the emergency provisions by failing to make a timely application for the amendment. Thus, the conditions needed to satisfy 10 CFR 50.91(a)(5) exist, and the amendment is being processed on an emergency basis.

5.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission's regulations in 10 CFR 50.92(c) state that the Commission may make a final determination that a proposed license amendment involves no significant hazards considerations if operation of the facility would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any previously analyzed; or (3) involve a significant reduction in a margin of safety.

As required by 10 CFR 50.91 (a), the licensee provided its analysis of the issue of no significant hazards consideration in its letter dated October 7, 2013, as presented below:

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

   The postulated event involving operability of the DIS is a beyond-design basis accident that generates a quantity of hydrogen from the reaction of the fuel cladding with water that is far in excess of the hydrogen release calculated for the limiting design basis accident. The DIS has been evaluated and is designed to mitigate this event. The proposed change will not increase the probability of such an accident because the DIS performs an entirely mitigative function. Except for brief periods of surveillance testing, the DIS is not in use during normal operation. The proposed change will not result in any physical changes to the plant which would affect accident initiators. Those structures, systems, and components (SSCs) involved in the initiation of postulated accidents will not be operated in any different manner. Therefore, the probability of occurrence of a previously evaluated accident will not be significantly increased.

   I&M's evaluation has determined that DIS will remain capable of performing its intended safety function of initiating controlled ignition of hydrogen resulting from a postulated beyond-design basis accident.

I&M's evaluation has demonstrated that propagation of hydrogen burning initiated by ignitors that remain operable will ensure adequate combustion in the regions potentially affected by the inoperable ignitors. Therefore, continued assurance of containment integrity would be provided following a postulated beyond-design basis accident even if significant quantities of hydrogen were generated. With containment integrity maintained, there would be no increase in radiation releases from such an accident. Additionally, the hydrogen concentration resulting from a design basis accident can be maintained less than the flammability limit using the hydrogen recombiners. Therefore, the consequences of a previously evaluated accident will not be significantly increased.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No.

   The proposed change does not alter the design function or operation of any SSC that may be involved in the initiation of an accident. The DIS will not become the source of a new type of accident. No new accident causal mechanisms will be created. The proposed change does not create new failure mechanisms, malfunctions, or accident initiators. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed change involve a significant reduction in the margin of safety?

   Response: No.

   The margin of safety involved with the DIS is that associated with protecting containment integrity from the potentially deleterious effects of a significant hydrogen accumulation following a beyond-design basis accident. I&M's evaluation has determined that the DIS will remain capable of performing its intended safety function of initiating controlled ignition of hydrogen resulting from such an accident, thereby assuring that the associated margin of safety for the containment will be maintained. Therefore, there is no significant reduction in a margin of safety as a result of the proposed amendment.

   Therefore, the proposed change does not involve a significant reduction in the margin of safety.

The NRC staff has reviewed the licensee's analysis and, based on that review, the staff concludes that the amendment meets the three criteria of 10 CFR 50.92. Therefore, the NRC staff has made a final determination that the amendment does not involve a significant hazards consideration.

6.0 STATE CONSULTATION

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

7.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts 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 made a final determination that the amendment involves no significant hazards consideration as discussed above in Section 5.0. Accordingly, the amendment meets 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 amendment.

8.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) the amendment does not (a) involve a significant increase in the probability or consequences of an accident previously evaluated, or (b) create the possibility of a new or different kind of accident from any previously evaluated, or (c) involve a significant reduction in a margin of safety and therefore, the amendment does not involve a significant hazards consideration; (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner; (3) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations; and (4) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: Jerome O. Bettle, NRR/DSS/SCVB
Thomas J. Wengert, NRR/DORL

Date: October 9, 2013

A copy of the related Safety Evaluation (SE) is enclosed. The SE describes the emergency circumstances under which the amendment was issued and the final no significant hazards determination. A Notice of Issuance addressing the final no significant hazards determination and opportunity for a hearing associated with the emergency circumstances, will be included in the Commission's next regular biweekly *Federal Register* notice.

Sincerely,

/RA/

Thomas J. Wengert, Senior Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-315

Enclosures:
1. Amendment No. 321 to DPR-58
2. Safety Evaluation

cc w/encls: Distribution via ListServ

DISTRIBUTION

PUBLIC	RidsNrrPMDCCook Resource	RidsNrrDssScvb Resource
LPL3-1 R/F	RidsNrrDorlDpr Resource	RidsNrrDirsItsb Resource
RidsNrrDorlLpl3-1 Resource	RidsOgcRp Resource	RidsRgn3MailCenter Resource
RidsNrrLAMHenderson Resource	RidsAcrsAcnw_MailCTR Resource	JBettle, NRR
RidsNrrDraApla		

ADAMS Accession No: ML13282A214 *via e-mail

OFFICE	LPL3-1/PM	LPL3-1/LA	DSS/SCVB/BC	DIRS/ITSB/BC	OGC /NLO	LPL3-1/BC	LPL3-1/PM
NAME	TWengert	MHenderson	RDennig *	RElliott	DRoth	RCarlson	TWengert
DATE	10/09/13	10/09/13	10/09/13	10/09/13	10/09/13	10/09/13	10/09/13

OFFICIAL RECORD COPY