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

August 19, 2016

Mr. Joel P. Gebbie
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 2 - ISSUANCE OF AMENDMENT TO REVISE TECHNICAL SPECIFICATION 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION (CAC NO. MF6984)

Dear Mr. Gebbie:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment No. 313 to Renewed Facility Operating License No. DPR-74, for the Donald C. Cook Nuclear Plant, Unit 2. The amendment consists of changes to the technical specifications (TSs) in response to your application dated October 19, 2015.

The amendment revises TS requirements for the Engineered Safety Feature Actuation System Instrumentation by adding a new Condition for inoperable required channels for main feedwater pump trips, and by adding a footnote to the Applicable Mode column of TS Table 3.3.2-1 to reflect the new Condition.

A copy of our related safety evaluation is also enclosed. A Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

Allison W. Dietrich, Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-316

Enclosures:
1. Amendment No. 313 to DPR-74
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. 50-316

DONALD C. COOK NUCLEAR PLANT, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 313
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 19, 2015, as supplemented by letters dated January 21, 2016, and April 18, 2016, 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-74 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 313, are hereby incorporated into this license. The licensee shall operate the

facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 180 days.

FOR THE NUCLEAR REGULATORY COMMISSION

for

David J. Wrona, Chief
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment: Changes to Renewed
Facility Operating License No. DPR-74
and Technical Specifications

Date of Issuance: August 19, 2016

ATTACHMENT TO LICENSE AMENDMENT NO. 313

DONALD C. COOK NUCLEAR PLANT, UNIT 2

RENEWED FACILITY OPERATING LICENSE NO. DPR-74

DOCKET NO. 50-316

Replace the following page of the Renewed Facility Operating License No. DPR-74 with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

REMOVE	INSERT
- 3 -	- 3 -

Replace the following pages of Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE	INSERT
3.3.2-3	3.3.2-3
3.3.2-4	3.3.2-4
3.3.2-5	3.3.2-5
3.3.2-11	3.3.2-11

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 3468 megawatts thermal in accordance with the conditions specified herein and in Attachment 1 to the renewed operating license. The preoperational tests, startup tests and other items identified in Attachment 1 to this renewed operating license shall be completed. Attachment 1 is an integral part of this renewed operating license.

(2) Technical Specifications

The Technical Specifications contained in Appendix A, and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 313, are hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(3) Additional Conditions

(a) Deleted by Amendment No. 76

(b) Deleted by Amendment No. 2

(c) Leak Testing of Emergency Core Cooling System Valves

Indiana Michigan Power Company shall prior to completion of the first inservice testing interval leak test each of the two valves in series in the

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. One or more Main Feedwater Pump trip channel(s) inoperable.	H.1 ----------NOTE---------- One channel on one MFW pump may be inoperable for up to 4 hours during the process of removing the pump from service or placing the pump in service. ---------- Restore channel(s) to OPERABLE status.	48 hours
I. Required Action and associated Completion Time of Condition H not met for Function 6.g. OR Required Action and associated Completion Time of Condition D not met for Function 6.f.	I.1 Be in MODE 3.	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
J. Required Action and associated Completion Time of Condition B not met for Function 8.a. OR Required Action and associated Completion Time of Condition C not met for Function 4.b, 5.a, 6.a, 6.b, or 7.b. OR Required Action and associated Completion Time of Condition D not met for Function 1.c, 1.d, 1.e.(1), 1.e.(2), 4.d, 4.e, 5.b, 6.c, 7.c, or 8.c. OR Required Action and associated Completion Time of Condition E not met for Function 2.c, 3.b.(3), or 4.c. OR Required Action and associated Completion Time of Condition F not met for Function 6.e. OR Required Action and associated Completion Time of Condition G not met for Function 8.b.	J.1 Be in MODE 3. AND J.2 Be in MODE 4.	6 hours 12 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
K. Required Action and associated Completion Time of Condition B not met for Function 1.a, 2.a, 3.a.(1), 3.b.(1), or 7.a. OR Required Action and associated Completion Time of Condition C not met for Function 1.b, 2.b, 3.a.(2), or 3.b.(2).	K.1 Be in MODE 3. AND K.2 Be in MODE 5.	6 hours 36 hours
L. Required Action and associated Completion Time of Condition B not met for Function 4.a.	L.1 Declare associated steam generator stop valve (SGSV) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

----------NOTE----------
Refer to Table 3.3.2-1 to determine which SRs apply for each ESFAS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.2.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.2.2	----------NOTE---------- Verification of relay setpoints not required. ---------- Perform TADOT.	 31 days

Table 3.3.2-1 (page 4 of 4)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
6. Auxiliary Feedwater					
c. SG Water Level - Low Low (per SG)	1,2,3	3	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≥ 20.8%
d. SI Input from ESFAS	1,2,3	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.			
e. Loss of Voltage (per bus)	1,2,3	3	F	SR 3.3.2.1 SR 3.3.2.2 SR 3.3.2.7 SR 3.3.2.12	≥ 3207.2 V and ≤ 3302.7 V with ≥ 1.8 sec and ≤ 2.2 sec time delay
f. Undervoltage Reactor Coolant Pump	1,2	1 per bus	D	SR 3.3.2.5 SR 3.3.2.7 SR 3.3.2.12	≥ 2725 V
g. Trip of all Main Feedwater Pumps (per pump)	1,2[(g)]	1	H	SR 3.3.2.9 SR 3.3.2.12	NA
7. Containment Air Recirculation/Hydrogen Skimmer (CEQ) System					
a. Manual Initiation	1,2,3,4	1 per train	B	SR 3.3.2.9	NA
b. Automatic Actuation Logic and Actuation Relays	1,2,3	2 trains	C	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.8	NA
c. Containment Pressure – High	1,2,3	3	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≤ 1.17 psig
8. ESFAS Interlocks					
a. Reactor Trip, P-4	1,2,3	1 per train	B	SR 3.3.2.9	NA
b. Pressurizer Pressure, P-11	1,2,3	3	G	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10	≤ 1915 psig
c. T_{avg} - Low Low, P-12	1,2,3[(b)]	1 per loop	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10	≥ 538.8°F

(b) Above the P-12 (T_{avg} - Low Low) interlock.

(g) When one or more Main Feedwater pump(s) are supplying feedwater to steam generators.

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NO. 313 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-74

INDIANA MICHIGAN POWER COMPANY

DONALD C. COOK NUCLEAR PLANT, UNIT 2

DOCKET NO. 50-316

1.0 INTRODUCTION

By application dated October 19, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15293A497), as supplemented by letters dated January 21, and April 18, 2016 (ADAMS Accession Nos. ML16028A144 and ML16112A195, respectively), Indiana Michigan Power Company (I&M, the licensee) requested a license amendment for the Donald C. Cook Nuclear Plant, Unit 2 (CNP-2). Specifically, the licensee requested to revise technical specification (TS) requirements for the Engineered Safety Feature Actuation System (ESFAS) Instrumentation by adding a new Condition for inoperable required channels for main feedwater (MFW) pump trips, and by adding a footnote to the Applicable Mode column of TS Table 3.3.2-1 to reflect the new Condition.

The licensee submitted the license amendment request (LAR) for the following reasons:

1) To allow startup and shutdown of a second main feedwater (MFW) pump without causing entry into TS 3.3.2 actions;
2) To allow both channels of the auxiliary feedwater (AFW) automatic startup (auto-start) function on a trip of all MFW pumps to be inoperable for 48 hours without causing entry into TS limiting condition for operation (LCO) 3.0.3; and
3) To provide consistency with CNP-1 TSs.

The supplemental letters dated January 21, 2016, and April 18, 2016, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC or Commission) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on December 22, 2015 (80 FR 79621).

2.0 REGULATORY EVALUATION

2.1 System Description

2.1.1 Main Feedwater System

As described in CNP-2 Updated Final Safety Analysis Report (UFSAR) Section 10.5.1, "Main Condensate and Feedwater System," the condensate and feedwater systems are designed to provide continuous and reliable feedwater flow to all steam generators (SGs) under all operating conditions. There are two turbine-driven, variable-speed MFW pumps installed in parallel.

This LAR supplemented the above UFSAR and TS Bases descriptions with the following additional information on the MFW pumps:

> The Main Feedwater Pump Turbines (MFPTs) provide motive power to drive the MFW pumps. The Feedwater Differential Pressure Control System regulates the speed, and thereby the differential pressure across the feedwater regulating valves to maintain valve operation in the linear response region. The MFPT Control System provides control of a single MFPT stop valve which isolates steam flow to the respective MFPT for various equipment and plant conditions.

CNP-2 TS Bases 3.3.2, item 6(g) describes the AFW system with respect to the trip logic of all MFW pumps. The TS Bases state that a trip of all MFW pumps is an indication of a loss of MFW and the subsequent need for some method of decay heat and sensible heat removal to bring the reactor back to no-load temperature and pressure. Each turbine-driven MFW pump is equipped with a steam stop valve. The stop valve contains a limit switch (i.e., channel), which actuates when the stop valve is closed. Since CNP-2 includes two turbine-driven MFW pumps, both channels (one per pump) must trip to start the motor-driven AFW pumps (i.e., a 2-out-of-2 logic configuration). LCO 3.3.2 requires one channel per pump to be operable.

2.1.2 Auxiliary Feedwater System

The AFW system is designed to provide a secondary side heat sink for the reactor in the event that the MFW system is not available. The AFW system is aligned so that upon a pump start, flow is initiated to the associated SG(s) immediately. As described in CNP-2, UFSAR, Section 10.5.2, "Auxiliary Feedwater System, Main Condensate and Feedwater System," the AFW system is designed to provide sufficient make-up to the SGs when the MFW supply is not available, particularly under the following scenarios: loss of MFW, station blackout, cooldown, rupture of main feedline, and rupture of main steamline.

Installed at CNP-2 is one turbine-driven AFW pump, which feeds all four SGs, and two motor-driven AFW pumps, each of which feeds two SGs. Train orientation is maintained throughout the AFW system including the AFW pumps, all associated valves, instrumentation, and controls.

The normal water source for AFW pumps is from the condensate storage tank. An emergency water source is provided from the essential service water system. Transfer of water source is accomplished by a remotely-operated, motor-operated valve and a manual valve. The supply

line from the condensate storage tank in each unit is cross-tied through a normally closed valve to provide an additional source of high purity water.

The motor-driven AFW pumps start automatically on the following signals:

1) low-low SG water level in 1 of 4 SGs
2) safety injection signal
3) trip of both MFW pumps
4) blackout signal initiated by loss of normal voltage to 4 kilovolt safety bus
5) less than 25 percent feedwater flow to 3 out of 4 loops when above 40 percent power

The CNP-2 UFSAR, Section 14.1.8, "Loss of External Electrical Load," Section 14.1.9, "Loss of Normal Feedwater," and Section 14.1.12, "Loss of All AC Power to the Plant Auxiliaries," all state that the AFW pumps auto-start on sensed low-low SG water level.

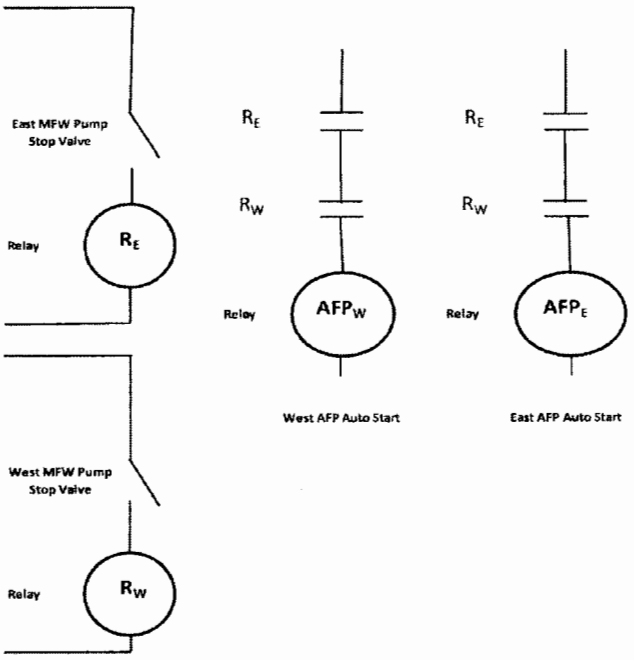
2.1.3 Trip of All Main Feedwater Pumps

As stated in the LAR, the AFW auto-start function on a trip of all MFW pumps is an anticipatory function in that it provides early actuation of the AFW system to mitigate the consequences of a loss of normal feedwater. The current TSs require that this function, Function 6.g, be operable in Mode 2 prior to the availability of sufficient feedwater demand to run a MFW pump.

A trip of all MFW pumps is an indication of a loss of MFW and the subsequent need for some method of decay heat and sensible heat removal to bring the reactor back to no load temperature and pressure. Each turbine-driven MFW pump is equipped with a steam stop valve. The LAR states that the control scheme for CNP-2 MFW pumps considers the MFW pumps to be tripped when the stop valve on each MFPT is shut. The stop valve contains a limit switch (i.e., channel), which actuates when the stop valve is closed to indicate that the MFW pump has tripped. Since the unit includes two turbine-driven MFW pumps, both channels (one per pump) must trip to start the motor-driven AFW pumps. When both MFW pumps are tripped, the 2-out-of-2 logic is satisfied to send a signal to auto-start the AFW pumps.

Function 6.g must be operable in MODES 1 and 2 since the MFW pumps are in operation. This ensures the SGs are provided with water to serve as the heat sink to remove reactor decay heat and sensible heat in the event of an accident. In MODES 3, 4, and 5, the MFW pumps are normally shut down, and thus a pump trip would not be indicative of a condition requiring automatic AFW initiation.

The LAR includes the following MFPT functional diagram:



A MFW trip channel is considered to be the position indication switch, which closes when the associated MFW pump steam stop valve closes, along with the energization of the relay. The R_E and R_W relays for the MFW pump trip channels in CNP-2 provide input to the AFW pump actuation train logic. When the AFW actuation relay for either MFW pump (R_E or R_W) is energized, a signal is sent to the AFW pump actuation logic circuit. The AFW pumps will start when signals from both MFW pump channels have been received by the AFW pump actuation logic circuit.

The LCO requires one channel per pump to be operable. This function does not meet the single failure criteria, however this is acceptable since the SG water level low-low function is credited to start the AFW system in the analyses of design basis accidents and transients that result in a loss of MFW. Although a trip of all MFW pumps starts the motor-driven AFW pumps, the trip of all MFW pumps to initiate AFW is not credited in the CNP-2 safety analysis.

2.2 Description of Proposed Change

The proposed change would add a new Condition H to LCO 3.3.2, and would state:

One or more Main Feedwater Pump trip channel(s) inoperable.

The proposed Required Action for TS 3.3.2 Condition H would state:

H.1 Restore channel(s) to OPERABLE status.

The proposed change would modify the Required Action for the new Condition H with the following:

> ----------NOTE----------
> One channel on one MFW pump may be inoperable for up to 4 hours during the process of removing the pump from service or placing the pump in service.
> ----------

The proposed Completion Time for Required Action H.1 would be 48 hours.

The proposed change would revise Mode 2 applicability for Function 6.g in Table 3.3.2-1, "Engineered Safety Feature Actuation System Instrumentation," with the following footnote:

> When one or more Main Feedwater pump(s) are supplying feedwater to steam generators.

The proposed change would adjust the numbering of the remaining Conditions in the actions Table for TS LCO 3.3.2. For example, the existing Conditions I, J, and K would be relabeled as Conditions J, K, and L.

2.3 Applicable Regulatory Requirements

Section 182a of the Atomic Energy Act requires applicants for nuclear power plant operating licenses to include TSs as part of the license.

The NRC's requirements related to the content of the TSs are contained in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Section 50.36(c). The regulations at 10 CFR 50.36(c) require that the TSs include items in the following categories: (1) safety limits, limiting safety systems settings, and limiting control settings; (2) LCOs; (3) surveillance requirements; (4) design features; and (5) administrative controls. As specified in 10 CFR 50.36(c)(2)(i), LCOs are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When an LCO of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the Condition can be met.

The four criteria defined by 10 CFR 50.36(c)(2)(ii) for determining whether particular items should be included in the TS LCOs are as follows:

> (A) *Criterion 1.* Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.
>
> (B) *Criterion 2.* A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

(C) *Criterion 3.* A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

(D) *Criterion 4.* A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

The licensee requested to amend the TSs for CNP-2. Since the TSs are part of the license, the licensee appropriately requested a license amendment under 10 CFR 50.90.

As described in the CNP, UFSAR, Section 1.4, the Plant Specific Design Criteria (PSDC) define the principal criteria and safety objectives for the CNP design. The following PSDC are relevant to the proposed amendment:

PSDC CRITERION 12, Instrumentation and Control Systems, states:

> Instrumentation and controls shall be provided as required to monitor and maintain within prescribed operating ranges essential reactor facility operating variables.

PSDC CRITERION 37, Engineered Safety Features Basis For Design, states:

> Engineered Safety Features shall be provided in the facility to back up the safety provided by the core design, the reactor coolant pressure boundary, and their protection systems. Such Engineered Safety Features shall be designed to cope with any size reactor coolant piping break up to and including the equivalent of a circumferential rupture of any pipe in that boundary, assuming unobstructed discharge from both ends.

PSDC CRITERION 38, Reliability and Testability of Engineered Safety Features, states:

> All Engineered Safety Features shall be designed to provide such functional reliability and ready testability as is necessary to avoid undue risk to the health and safety of the public.

3.0 TECHNICAL EVALUATION

3.1 Background

The NRC issued Information Notice (IN) 2015-05, "Inoperability of Auxiliary and Emergency Feedwater Auto-Start Circuits on Loss of Main Feedwater Pumps," on May 12, 2015 (ADAMS Accession No. ML15008A493). IN 2015-05 describes several instances between 2006 and 2012 where licensees operated their MFW systems in such a manner that the automatic initiation of auxiliary or emergency feedwater on loss of all MFW pumps was disabled. The licensee

evaluated IN 2015-05 and determined that the design and operation of the CNP MFW pumps has resulted in conditions similar to those described in the IN.

The licensee requested a similar change to TS 3.3.2 for CNP-1 by letters dated June 29, 2015 (ADAMS Accession No. ML15181A002), as supplemented by letter dated July 2, 2015 (ADAMS Accession No. ML15187A366). The associated license amendment was issued on July 10, 2015 (ADAMS Accession No. ML15187A002). The licensee is proposing to implement a similar change for CNP-2 to ensure consistency in format and function between the CNP-1 and CNP-2 TSs.

CNP-1 has two channels per MFW pump that are associated with the low pressure and high pressure main feedwater pressure temperature steam stop valves, whereas CNP-2 has one channel per MFW pump associated with one MFPT steam stop valve. For both units, the AFW auto-start function on a trip of all MFW pumps is an anticipatory circuit and is not credited in the safety analysis. The SG water level low-low signal for auto-start of the AFW is used in the safety analysis for a loss of MFW.

The current CNP-2 TS 3.3.2, ESFAS Instrumentation, Table 3.3.2-1, Function 6.g, requires the function, 'AFW auto-start on a trip of all MFW pumps,' to be operable in Modes 1 and 2. The required number of channels for the AFW auto-start function is one trip channel per MFW pump. Startup or securing a MFW pump initially causes the associated MFW pump trip channel to be inoperable when the MFPT steam stop valve is open and before the MFW pump is supplying feedwater to the SGs. With one of the MFW pump trip channels inoperable, TS 3.3.2 Condition B is entered which requires the channel be restored to operable status within 48 hours. Also, the current TS 3.3.2 Function 6.g does not have provision for both channels to be inoperable, and such condition would require plant shutdown per TS 3.0.3. The licensee has stated that the above described adherence to TS 3.3.2 is not necessary for plant safety and causes unnecessary entry into a TS action. To address the above concerns while maintaining the purpose of the circuit (AFW auto-start function on a trip of all MFW pumps) and TS requirements per 10 CFR 50.36, the licensee has proposed changes to TS 3.3.2.

The proposed TS change modifies the Applicability of this requirement to be Mode 1 and Mode 2 when one or more MFW pump(s) are supplying feedwater to the SGs. The proposed TS change adds a Condition H that is entered when one or more MFW pump trip channels are inoperable. The Required Action H.1 is to restore the channel(s) to operable status with a Completion Time of 48 hours. Required Action H.1 is modified by a note which states that one channel on one MFW pump may be inoperable for up to 4 hours during the process of removing the pump from service or placing the pump in service. The proposed Completion Time of 48 hours for Required Action H.1 is consistent with the existing Completion Time for Required Action B.1.

3.2 NRC Staff Evaluation

3.2.1 Mode 2 Applicability

The licensee proposed to add a qualifying footnote to the applicability of TS 3.3.2 Function 6.g when in Mode 2. Mode 2 is a plant startup, with a critical reactor and rated thermal power less than 5 percent. The footnote will eliminate the requirement that Function 6.g be met in Mode 2

when the MFW pumps are not running. In the application, the licensee stated that during some period in Mode 2, AFW supplies feed water to the SGs while a MFW pump is being started, but is not yet suppling feedwater to the SGs. The LAR states that since the AFW pumps are already in service and used as the primary means of removing heat from the reactor core up to 4 percent power in Mode 2, the anticipatory AFW auto-start function serves no useful purpose. If an AFW pump were to fail during startup or shutdown, the redundant AFW pump(s) would start automatically on low-low SG water level, if not already manually initiated by the operator in accordance with station operating procedures. During this time, the actuation of AFW from an indicated MFW pump trip would be redundant and is not necessary, as AFW is already in service. The AFW auto-start function on a trip of all MFW pumps is not needed until a MFW pump is actually supplying feedwater to the SGs. For this reason, the licensee proposed a footnote that would revise the Mode 2 applicability for the MFW pump trip auto-start function of AFW. The footnote would read: "When one or more Main Feedwater Pump(s) are supplying feedwater to steam generators."

AFW remains in service until after startup of the first MFW Pump. Once the first MFW pump is supplying feedwater, the AFW system can be restored to its standby alignment. The licensee stated that the second MFW pump is placed in service later in the power ascension phase of plant startup and prior to the unit reaching 60 percent rated thermal power. With both MFW Pumps in service, the automatic actuation of AFW on Trip of both MFW pumps is required to be operable. During a plant shutdown, when securing the last MFW pump, the process is reversed.

The NRC staff considered the licensee's description of the process for starting and securing the MFW pumps, and confirmed that the function of AFW actuation on a trip of both MFW Pumps is only necessary when one or more MFW pumps are supplying feedwater to the SGs. Additionally, the plant safety function is met by the auto-start of both AFW pumps on low-low SG water level. Auto-start of the AFW pumps on trip of both MFW pumps is not a credited event in the plant accident analysis. Therefore, the staff finds the proposed footnote to revise Mode 2 applicability for Function 6.g to be required only when one or more MFW pumps are supplying feedwater to the SGs to be acceptable.

3.2.2 Condition H, One or more Main Feedwater Pump Trip Channel(s) Inoperable

During the startup of a second MFW pump, or when taking a second MFW pump offline, the MFPT is receiving steam, but the MFW pump is not supplying feedwater to the SGs. During these sequences, the AFW auto-start function on a trip of all MFW pumps is inoperable, causing entry into TS 3.3.2 action statement for function 6.g.

TSs are established in accordance with 10 CFR 50.36, which typically do not require action for safe routine evolutions such as starting or stopping a MFW pump per normal operating procedures. Ordinarily, TS Conditions are only applicable during testing or degraded or abnormal occurrences. Therefore, entry into a TS 3.3.2 action statement when a second MFW pump is started or stopped during such evolutions as power ascension or power decrease does not meet the intent of 10 CFR 50.36 and is not necessary for reactor safety. Thus, the addition of Condition H, "One or more Main Feedwater Pump trip channel(s) inoperable," with a note allowing for the startup or shutdown of a pump, is appropriate. The new Condition H also provides for both channels to be inoperable without requiring a plant shutdown per TS 3.0.3.

The LAR stated the following regarding post-maintenance testing of MFW pumps:

> [W]ith one MFW pump in service, the second MFW pump turbine may be started uncoupled from the pump to facilitate some post maintenance testing activities. In this instance, Required Action H.1 would be entered and the 48-hour completion time would apply when the stop valve to the MFW pump is open. This post maintenance testing is not considered a normal plant startup or shutdown activity, but instead facilitates completion of maintenance activities that can be completed with one MFW pump in service.
>
> Additionally, Required Action H.1 would be entered any time one or more MFW pump trip channels are inoperable due to an actual channel failure or degradation mechanism being present.

The 2-out-of-2 logic means that one or more channels inoperable would render the auto-start function of AFW pumps for Function 6.g non-functional. The proposed Completion Time of 48 hours for Required Action H.1 is consistent with the previously applicable Condition B, which allowed 48 hours with one channel inoperable. Therefore, the NRC staff finds the proposed Completion Time of 48 hours to restore one or more of the inoperable channels to operable status to be acceptable.

3.2.3 Four-hour Allowance for Starting and Securing MFW Pumps

As discussed in Section 3.2.1 of this safety evaluation, the proposed Mode 2 applicability of the MFW pump trip auto-start function of AFW is "When one or more Main Feedwater Pump(s) are supplying feedwater to steam generators." Thus, Condition H does not apply during the startup of the first MFW pump, when AFW is in operation. The licensee proposed a Note modifying new Required Action H.1 to permit the MFW pump trip instrumentation to be inoperable for 4 hours when starting or securing the second MFW pump, without entering Condition H. The LAR notes that the process for placing a MFW pump in service can require more than one hour, with 4 hours being sufficient time to complete placing a MFW pump in operation. The LAR further states that the 4-hour provision would not apply during the start of the first MFW pump, as both motor-driven AFW pumps would be running the entire time.

After the first MFW pump is feeding the SGs, the AFW pumps are removed from service. A trip of the second MFW Pump that is being started or secured would not impact the online MFW pump, and, therefore, the feedwater supply to the SGs would not be affected. During this brief time allowance, new Condition H would not be entered and the TS, LCO 3.3.2 6.g, would continue to be met.

The 4-hour provision would start to apply when the turbine stop valve on the second MFW pump is opened while placing the second MFW pump in service. The provision would no longer apply to the second MFW pump once the pump is either capable of feeding the SGs, with discharge pressure of the MFW pump just below SG pressure, or is feeding the SGs. Therefore, when both MFW pumps are in service, and the one required channel per pump is functionally able to provide the required trip input for actuation of AFW, the provision will no longer be applied. The

NRC staff confirmed that the starting and stopping or online testing of a second MFPT per approved operating procedures is a routine safe evolution where TS action is not warranted.

Regarding the process for removing the MFW pumps from service, the LAR notes that the normal method is to trip the pumps (i.e., both MFW turbine stop valves shut), and therefore the 4-hour provision would not be used. The 4-hour provision will allow for the use of a slower method of removing the pumps from service, if needed.

As noted previously, the AFW auto-start function on a trip of all MFW pumps is not credited in the loss of MFW, as the low-low SG water level signal provides the required auto-start feature. The 4-hour allowance is appropriate because it allows sufficient time to complete the evolution of starting or securing a MFW pump, and it restores the TS action after the brief 4-hour interlude. The NRC staff considered the licensee's explanation and justification for the 4-hour allowance and determined that it was an appropriate allowance while starting and securing a MFW Pump. Therefore, the staff finds the proposed Condition H for one or more MFW pump trip channels inoperable, and the 4-hour inoperable time for one MFW pump trip channel during the process of placing the pump in service or removing the pump from service, to be acceptable. This change is incorporated by addition of new Condition H, which is consistent with the previously approved change to the CNP-1 TSs.

3.3 Technical Evaluation Conclusion

Current TSs require entry into Condition B when one MFW pump trip channel is inoperable. In the case of the AFW auto-start on a trip of all MFW pumps, whether one MFW pump trip channel or both channels are inoperable, the effect is the same, which is the inoperability of the AFW auto-start circuit. However, inoperability of both channels is not addressed in the current TS action statements, and therefore would require entry into TS 3.0.3, which is undesirable for a condition that is not adverse to reactor safety. The licensee's new Condition H allows either one or more channels to be inoperable for 48 hours. This proposed change does not remove any current operational restrictions other than unnecessary forced entry into TS 3.0.3. Therefore, the NRC staff approves new Condition H.

The proposed change modifies the Mode of Applicability for the function of a Trip of both MFW pumps to actuate AFW, and states that the instrumentation may be inoperable for up to 4 hours during starting or securing a MFW Pump. The requirement to maintain the function and the remedial measures to be taken if one or more of these instruments becomes inoperable is maintained. In addition, there is reasonable assurance that the instrumentation will continue to perform its required safety functions. Therefore, the LCO and associated Conditions and Required Actions remain in compliance with 10 CFR 50.36 requirements.

In conclusion, the NRC staff has reviewed the licensee's proposed TS changes to TS 3.3.2, and finds that the change is acceptable and meets the regulatory requirements 10 CFR 50.36, and PSDC Criteria 12, 37, and 38. Thus, the NRC staff approves the requested changes to CNP-2 TS 3.3.2.

4.0 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.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes the requirements with respect to installation or 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, 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 in the *Federal Register* on December 22, 2015 (80 FR 79621) a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding. 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.

6.0 CONCLUSION

The Commission 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) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Date of issuance: August 19, 2016

August 19, 2016

Mr. Joel P. Gebbie
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 2 - ISSUANCE OF AMENDMENT TO REVISE TECHNICAL SPECIFICATION 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION (CAC NO. MF6984)

Dear Mr. Gebbie:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment No. 313 to Renewed Facility Operating License No. DPR-74, for the Donald C. Cook Nuclear Plant, Unit 2. The amendment consists of changes to the technical specifications (TSs) in response to your application dated October 19, 2015.

The amendment revises TS requirements for the Engineered Safety Feature Actuation System Instrumentation by adding a new Condition for inoperable required channels for main feedwater pump trips, and by adding a footnote to the Applicable Mode column of TS Table 3.3.2-1 to reflect the new Condition.

A copy of our related safety evaluation is also enclosed. A Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,
/RA/
Allison W. Dietrich, Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-316

Enclosures:
1. Amendment No. 313 to DPR-74
2. Safety Evaluation

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ADAMS Accession No: ML16216A181 ***via memo**

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