

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

April 30, 2009

Mr. Joseph N. Jensen 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, UNITS 1 and 2 - ISSUANCE OF AMENDMENT TO RENEWED FACILITY OPERATING LICENSE REGARDING TECHNICAL SPECIFICATION CHANGE RELATING TO DIESEL GENERATOR STEADY-STATE PARAMETERS (TAC NOS. MD8773 and MD8774)

Dear Mr. Jensen:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment Nos. 309 and 291 to Renewed Facility Operating License Nos. DPR-58 and DPR-74 for the Donald C. Cook Nuclear Plant, Units 1 and 2, respectively. The amendment changes the Technical Specifications (TS) in response to your application dated June 27, 2007, as supplemented by letters dated April 28, September 4, and December 17, 2008.

The amendment modifies TS Section 3.8.1, "AC [alternating current] Sources – Operating." The amendment also affects TS Section 3.8.2, "AC Sources – Shutdown," in that certain surveillance requirements from Section 3.8.1 are necessary to ensure operability of AC sources when shutdown. The changes are necessary to correct a non-conservative TS value.

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

Sincerely,

'und

Terrý A. Beltz, Senior Project Manager Plant Licensing Branch III-1 Division of Operating Reactor Licensing Office of Nuclear Reactor Regulation

Docket Nos. 50-315 and 50-316

Enclosures: 1. Amendment No. 309 to DPR-58 2. Amendment No. 291 to DPR-74 3. 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. 309 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 June 27, 2007, as supplemented by letters dated April 28, September 4, and December 17, 2008, 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) <u>Technical Specifications</u>

The Technical Specifications contained in Appendix A and Appendix B, as revised through Amendment No. 309 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 45 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Laundames

Lois M. James, Chief Plant Licensing Branch III-1 Division of Operating Reactor Licensing Office of Nuclear Reactor Regulation

Attachment: Changes to the Renewed Operating License and Appendix A

Date of Issuance: April 30, 2009

ATTACHMENT TO LICENSE AMENDMENT NO. 309

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	<u>INSERT</u>

- 3 -

- 3 -

Replace the following pages of Appendix A, Technical Specifications, with the attached revised pages. The change area is identified by a marginal line.

REMOVE	INSERT
3.8.1-6	3.8.1-6
3.8.1-8	3.8.1-8
3.8.1-9	3.8.1-9
3.8.1-11	3.8.1-11
3.8.1-12	3.8.1-12
3.8.1-14	3.8.1-14
3.8.1-16	3.8.1-16
3.8.1-18	3.8.1-18

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 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, Section 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 therein.

(2) Technical Specifications

The Technical Specifications contained in Appendix A and Appendix B, as revised through Amendment No. 309, are hereby incorporated in the renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

(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

> Renewed License No. DPR-58 Amendment No. 306, 307, 308, 309

SURVEILLANCE REQUIREMENTS

-----NOTES------

- 1. SR 3.8.1.1 through SR 3.8.1.22 are applicable only to the AC electrical power sources for Unit 1.
- 2. SR 3.8.1.23 is applicable only to the Unit 2 required AC electrical power sources. The Surveillances referenced in SR 3.8.1.23 are the Unit 2 Surveillance Requirements.

	FREQUENCY	
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each offsite circuit.	7 days
SR 3.8.1.2	 NOTESNOTES	31 days
	achieves steady state voltage \ge 3910 V and \le 4400 V, and frequency \ge 59.4 Hz and \le 60.5 Hz.	

1

T

	SURVEILLANCE	FREQUENCY
SR 3.8.1.8	All DG starts may be preceded by an engine prelube period.	
	Verify each DG starts from standby condition and achieves:	184 days
	 a. In ≤ 10 seconds, voltage ≥ 3910 V and frequency ≥ 59.4 Hz; and 	
	b. Steady state voltage ≥ 3910 V and ≤ 4400 V, and frequency ≥ 59.4 Hz and ≤ 60.5 Hz.	
SR 3.8.1.9	SR 3.8.1.9.a is only required to be met when the auxiliary source is supplying the electrical power distribution subsystem.	
	Verify:	24 months
	 Automatic transfer from the auxiliary source to the preferred offsite circuit; and 	
	b. Manual alignment to the alternate offsite circuit.	

SURVEILLANCE			FREQUENCY
SR 3.8.1.10	1.	This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.	
	2.	If performed with the DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.86 . However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.	
	Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and:		24 months
	a.	Following load rejection, the frequency is ≤ 64.4 Hz;	
	b.	Within 2 seconds following load rejection, the voltage is \geq 3910 V and \leq 4400 V; and	
	C.	Within 2 seconds following load rejection, the frequency is \ge 59.4 Hz and \le 60.5 Hz.	

ł

SURVEILLANCE			FREQUENCY	
SR 3.8.1.12	 1. 2.	All [pre] This perf port to re asso mai for u	OG starts may be preceded by an engine ube period. Surveillance shall not normally be formed in MODE 1, 2, 3, or 4. However, ions of the Surveillance may be performed eestablish OPERABILITY provided an essment determines the safety of the unit is ntained or enhanced. Credit may be taken unplanned events that satisfy this SR.	
	Vei sig	rify on an actual or simulated loss of offsite power nal:		24 months
	a.	a. De-energization of emergency buses;		
	b.	Loa	d shedding from emergency buses;	
	C.	DG	auto-starts from standby condition and:	
		1.	Energizes permanently connected loads in ≤ 10 seconds;	
		2.	Energizes auto-connected shutdown loads through time delay relays, where applicable;	
		3.	Maintains steady state voltage ≥ 3910 V and ≤ 4400 V;	
		4.	Maintains steady state frequency ≥ 59.4 Hz and ≤ 60.5 Hz; and	
		5.	Supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes.	

1

	FREQUENCY		
SR 3.8.1.13	 1. 2. Vei Fea	SURVEILLANCE NOTES	FREQUENCY 24 months
	froi	m standby condition and:	
	a.	In \leq 10 seconds achieves voltage \geq 3910 V and frequency \geq 59.4 Hz;	
	b.	Achieves steady state voltage ≥ 3910 V and ≤ 4400 V and frequency ≥ 59.4 Hz and ≤ 60.5 Hz;	
	C.	Operates for \geq 5 minutes;	
	d.	Permanently connected loads remain energized from the offsite power system; and	
	e.	Emergency loads are auto-connected through the time delay relays, where applicable, from the offsite power system.	

I

	SURVEILLANCE	FREQUENCY
SR 3.8.1.16	 This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 2 hours loaded ≥ 3150 kW and ≤ 3500 kW. Momentary transients outside of load range do not invalidate this test. All DG starts may be preceded by an engine prelube period. 	
	 Verify each DG starts and achieves: a. In ≤ 10 seconds, voltage ≥ 3910 V and frequency ≥ 59.4 Hz; and b. Steady state voltage ≥ 3910 V and ≤ 4400 V and frequency ≥ 59.4 Hz and ≤ 60.5 Hz. 	24 months
SR 3.8.1.17	 NOTE	24 months
	c. Returns to ready-to-load operation.	

SURVEILLANCE			FREQUENCY	
SR 3.8.1.19	 1.	All [prel	NOTES OG starts may be preceded by an engine ube period.	
	2.	This perf port to re asse main for u	Surveillance shall not normally be ormed in MODE 1, 2, 3, or 4. However, ions of the Surveillance may be performed eestablish OPERABILITY provided an essment determines the safety of the unit is ntained or enhanced. Credit may be taken unplanned events that satisfy this SR.	
	Vei sig ES	rify on nal in F actu	an actual or simulated loss of offsite power conjunction with an actual or simulated lation signal:	24 months
	a.	De-e	energization of emergency buses;	
	b.	Load shedding from emergency buses; and		
	C.	DG	auto-starts from standby condition and:	
		1.	Energizes permanently connected loads in ≤ 10 seconds;	
		2.	Energizes auto-connected emergency loads through time delay relays, as applicable;	
		3.	Achieves steady state voltage ≥ 3910 V and ≤ 4400 V;	
		4.	Achieves steady state frequency ≥ 59.4 Hz and ≤ 60.5 Hz; and	
		5.	Supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	

ł

L

	FREQUENCY	
SR 3.8.1.22	NOTE All DG starts may be preceded by an engine prelube period.	
	Verify when started simultaneously from standby condition, each DG achieves, in \leq 10 seconds, voltage \geq 3910 V and frequency \geq 59.4 Hz.	10 years
SR 3.8.1.23	 When Unit 2 is in MODE 5 or 6, or moving irradiated fuel assemblies in the containment or auxiliary building, the following Unit 2 SRs are not required to be performed: SR 3.8.1.3, SR 3.8.1.10, SR 3.8.1.11, SR 3.8.1.12, SR 3.8.1.15, SR 3.8.1.16, SR 3.8.1.17, and SR 3.8.1.18. 	
	 Unit 2 SR 3.8.1.9.a is only required to be met when the auxiliary source is supplying the required Unit 2 electrical power distribution subsystem. 	
	For required Unit 2 AC sources, the SRs of Unit 2 Specification 3.8.1, except SR 3.8.1.9.b, SR 3.8.1.13, SR 3.8.1.14 (ESF actuation signal portion only), SR 3.8.1.19, SR 3.8.1.20, SR 3.8.1.21, and SR 3.8.1.22, are applicable.	In accordance with applicable SRs



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. 291 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 June 27, 2007, as supplemented by letters dated April 28, September 4, and December 17, 2008, 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) <u>Technical Specifications</u>

The Technical Specifications contained in Appendix A and Appendix B, as revised through Amendment No. 291 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 45 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Lasnames

Lois M. James, Chief Plant Licensing Branch III-1 Division of Operating Reactor Licensing Office of Nuclear Reactor Regulation

Attachment: Changes to the Renewed Operating License and Appendix A

Date of Issuance: April 30, 2009

ATTACHMENT TO LICENSE AMENDMENT NO. 291

RENEWED FACILITY OPERATING LICENSE NO. DPR-74

DOCKET NO. 50-315

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

<u>REMOVE</u>	<u>INSERT</u>
- 3 -	- 3 -

Replace the following pages of Appendix A, Technical Specifications, with the attached revised pages. The change area is identified by a marginal line.

REMOVE	INSERT
3.8.1-6	3.8.1-6
3.8.1-8	3.8.1-8
3.8.1-9	3.8.1-9
3.8.1-11	3.8.1-11
3.8.1-12	3.8.1-12
3.8.1-14	3.8.1-14
3.8.1-16	3.8.1-16
3.8.1-18	3.8.1-18

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 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, Section 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) <u>Maximum Power Level</u>

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 therein.

(2) <u>Technical Specifications</u>

The Technical Specifications contained in Appendix A and Appendix B, as revised through Amendment No. 291, are hereby incorporated in the renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

(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

Renewed License No. DPR-74 Amendment No. 289, 290, 291

SURVEILLANCE REQUIREMENTS

- SR 3.8.1.1 through SR 3.8.1.22 are applicable only to the AC electrical power sources for Unit 2.
- 2. SR 3.8.1.23 is applicable only to the Unit 1 required AC electrical power sources. The Surveillances referenced in SR 3.8.1.23 are the Unit 1 Surveillance Requirements.

	FREQUENCY				
SR 3.8.1.1	SR 3.8.1.1 Verify correct breaker alignment and indicated power availability for each offsite circuit.				
SR 3.8.1.2	 R 3.8.1.2 All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. A modified DG start involving gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.8 must be met. 				

ł

1

	FREQUENCY	
SR 3.8.1.8	All DG starts may be preceded by an engine prelube period.	
	achieves:	184 days
	 a. In ≤ 10 seconds, voltage ≥ 3910 V and frequency ≥ 59.4 Hz; and 	
	b. Steady state voltage ≥ 3910 V and ≤ 4400 V, and frequency ≥ 59.4 Hz and ≤ 60.5 Hz.	
SR 3.8.1.9	SR 3.8.1.9NOTENOTE SR 3.8.1.9.a is only required to be met when the auxiliary source is supplying the electrical power distribution subsystem.	
	Verify:	24 months
	 Automatic transfer from the auxiliary source to the preferred offsite circuit; and 	
	b. Manual alignment to the alternate offsite circuit.	

	FREQUENCY		
SR 3.8.1.10	1.	This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.	
	2.	If performed with the DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.86 . However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.	
	Vei to i and	ify each DG rejects a load greater than or equal ts associated single largest post-accident load, t:	24 months
	a.	Following load rejection, the frequency is ≤ 64.4 Hz;	
	b.	Within 2 seconds following load rejection, the voltage is \ge 3910 V and \le 4400 V; and	
	C.	Within 2 seconds following load rejection, the frequency is \geq 59.4 Hz and \leq 60.5 Hz.	

ļ

SURVEILLANCE				FREQUENCY
SR 3.8.1.12	 1. 2.	All [prel This perf port to re asso mai for u	DG starts may be preceded by an engine ube period. Surveillance shall not normally be formed in MODE 1, 2, 3, or 4. However, ions of the Surveillance may be performed eestablish OPERABILITY provided an essment determines the safety of the unit is ntained or enhanced. Credit may be taken unplanned events that satisfy this SR.	
	Ve sig	rify on nal:	24 months	
	a.	De-	energization of emergency buses;	
	b.	Loa	d shedding from emergency buses;	
	C.	DG	auto-starts from standby condition and:	
		1.	Energizes permanently connected loads in ≤ 10 seconds;	
		2.	Energizes auto-connected shutdown loads through time delay relays, where applicable;	
		3.	Maintains steady state voltage ≥ 3910 V and ≤ 4400 V;	
		4.	Maintains steady state frequency ≥ 59.4 Hz and ≤ 60.5 Hz; and	
		5.	Supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes.	

I

I

		SURVEILLANCE	FREQUENCY
SR 3.8.1.13	1. 2. Ver Fea fron a. b. c. d.	SURVEILLANCE NOTES All DG starts may be preceded by an engine prelube period. This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. Tify on an actual or simulated Engineered Safety ature (ESF) actuation signal each DG auto-starts in standby condition and: In \leq 10 seconds achieves voltage \geq 3910 V and frequency \geq 59.4 Hz; Achieves steady state voltage \geq 3910 V and \leq 4400 V and frequency \geq 59.4 Hz and \leq 60.5 Hz; Operates for \geq 5 minutes; Permanently connected loads remain energized from the offsite power system; and	FREQUENCY 24 months
	e.	Emergency loads are auto-connected through the time delay relays, where applicable, from the offsite power system.	

1

	FREQUENCY		
SR 3.8.1.16	SR 3.8.1.16 1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 2 hours loaded ≥ 3150 kW and ≤ 3500 kW. Momentary transients outside of load range do not invalidate this test.		
	prelube period.		
	Verify each DG starts and achieves:	24 months	
	 a. In ≤ 10 seconds, voltage ≥ 3910 V and frequency ≥ 59.4 Hz; and 		
	 b. Steady state voltage ≥ 3910 V and ≤ 4400 V and frequency ≥ 59.4 Hz and ≤ 60.5 Hz. 		
SR 3.8.1.17	NOTE		
	This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.		
	24 months		
	 Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power; 		
	b. Transfers loads to offsite power source; and		
	c. Returns to ready-to-load operation.		

	FREQUENCY			
SR 3.8.1.19	1. 2.	All E prel This perf	OG starts may be preceded by an engine ube period. Surveillance shall not normally be ormed in MODE 1, 2, 3, or 4. However,	
		to re asse maii for u	eestablish OPERABILITY provided an essment determines the safety of the unit is ntained or enhanced. Credit may be taken unplanned events that satisfy this SR.	
	Ver sigi ES	rify on nal in F actu	an actual or simulated loss of offsite power conjunction with an actual or simulated lation signal:	24 months
	а.	De-	energization of emergency buses;	
	b.	Loa	d shedding from emergency buses; and	
	C.	DG	auto-starts from standby condition and:	
		1.	Energizes permanently connected loads in ≤ 10 seconds;	
		2.	Energizes auto-connected emergency loads through time delay relays, as applicable;	
		3.	Achieves steady state voltage ≥ 3910 V and ≤ 4400 V;	
		4.	Achieves steady state frequency ≥ 59.4 Hz and ≤ 60.5 Hz; and	
		5.	Supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	

I

I

	FREQUENCY	
SR 3.8.1.22	NOTENOTE All DG starts may be preceded by an engine prelube period.	
	Verify when started simultaneously from standby condition, each DG achieves, in \leq 10 seconds, voltage \geq 3910 V and frequency \geq 59.4 Hz.	10 years
SR 3.8.1.23	 When Unit 1 is in MODE 5 or 6, or moving irradiated fuel assemblies in the containment or auxiliary building, the following Unit 1 SRs are not required to be performed: SR 3.8.1.3, SR 3.8.1.10, SR 3.8.1.11, SR 3.8.1.12, SR 3.8.1.15, SR 3.8.1.16, SR 3.8.1.17, and SR 3.8.1.18. 	
	 Unit 1 SR 3.8.1.9.a is only required to be met when the auxiliary source is supplying the required Unit 1 electrical power distribution subsystem. 	
	For required Unit 1 AC sources, the SRs of Unit 1 Specification 3.8.1, except SR 3.8.1.9.b, SR 3.8.1.13, SR 3.8.1.14 (ESF actuation signal portion only), SR 3.8.1.19, SR 3.8.1.20, SR 3.8.1.21, and SR 3.8.1.22, are applicable.	In accordance with applicable SRs



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOs. 309 AND 291

TO RENEWED FACILITY OPERATING LICENSE NOS. DPR-58 AND 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 application dated June 27, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML071910238), Indiana Michigan Power Company (I&M, the licensee) requested changes to the Donald C. Cook (D.C. Cook) Nuclear Plant, Units 1 and 2, Technical Specifications (TS), Section 3.8.1, relating to the maximum steady-state frequency of the diesel generators (DGs). The proposed amendment would change the maximum steady-state frequency of the DGs from 61.2 Hertz (Hz) to 60.5 Hz. The application was supplemented by letters dated April 28 (ADAMS Accession No. ML081280649), September 4 (ADAMS Accession No. ML082600469), and December 17, 2008 (ADAMS Accession No. ML090430399).

The additional information provided in the supplemental letters dated April 28, 2008 and December 17, 2008, clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original no significant hazards consideration determination as published in the *Federal Register* on August 14, 2007 (72 FR 45458).

The supplemental letter dated September 4, 2008, provided additional information that expanded the scope of the application as originally noticed in the *Federal Register*. The U.S. Nuclear Regulatory Commission (NRC) staff identified during its review of the maximum steady-state frequency changes that the DG voltage of 3740 volts (V) at 10 seconds after the DG start (currently specified in TS) was non-conservative and inconsistent with the 3910 V minimum steady-state voltage provided in other parts of TS 3.8.1. The licensee subsequently proposed additional changes to TS Section 3.8.1 in its September 4, 2008, letter. The NRC staff determined that the proposed change to the amendment involved a proposed no significant hazards consideration as published in the *Federal Register* on November 4, 2008 (73 FR 65696).

2.0 REGULATORY EVALUATION

The following NRC requirements and guidance documents were used by the NRC staff to review the license amendment request:

Enclosure

Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, specifies that the TSs shall be included by applicants for a license authorizing operation of a production or utilization facility. The regulation at 10 CFR 50.36(c) requires that TSs include items in five specific categories related to station operation. These categories include (1) safety limits, limiting safety system settings, and limiting control settings; (2) limiting conditions for operations; (3) surveillance requirements (SRs); (4) design features; and (5) administrative controls. The proposed changes to the TSs, as discussed in this safety evaluation, are within the SRs category.

Regulatory Guide (RG) 1.9, Revision 3, "Selection, Design, Qualification, and Testing of Emergency Diesel Generator (EDG) Units Used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants," provides certain recommendations for the EDG design and testing, which in general are used as guidance to develop the SRs for the DGs.

3.0 TECHNICAL EVALUATION

3.1 <u>Background</u>

Each unit at D.C. Cook has two full-capacity DGs each supplying power to two safety-related 4160 volt (V) buses. Loss of voltage to the 4160 V buses is sensed by loss-of-voltage relays. Upon sensing loss of voltage, the master relays automatically start the DGs, trip the normal feed circuit breakers for the 4160 V buses, and trip all motor feeder breakers and 480 V transformer feeder breakers on the buses, the 600 V bus tie breaker, non-essential 600 V feeder breakers, and 480 V bus breakers. The DG circuit breakers which connect the DG output to the 4160 V system are automatically closed when voltage and speed approach rated values. The DGs supply power to the 600 V buses through the 4160 V buses and transformers, respectively.

After the start signal, each DG is capable of accepting load within 10 seconds. If either DG fails to start, the remaining one is capable of supplying the required engineered safeguard load. A Safety Injection (SI) signal also starts the DGs. To avoid overloading of the DGs, the non-essential loads are shed when the SI signal occurs and the safety buses are energized from the DGs.

Each DG is sized at 3500 kilowatts (kW) to provide power to operate one train of safety equipment assuming a loss-of-power concurrent with a loss-of-coolant accident (LOCA), with or without containment spray.

3.2 Evaluation of Proposed Change to Maximum Steady-State Frequency

In its letter dated June 27, 2007, the licensee proposed to modify the DG SRs for maximum steady-state frequency from 61.2 Hz to 60.5 Hz for TS 3.8.1, "AC Sources - Operating," SR 3.8.1.2, 3.8.1.8.b, 3.8.1.12.c.4, 3.8.1.13.b, 3.8.1.16.b, and 3.8.1.19.c.4.

The licensee stated that changing the DG maximum steady-state frequency will correct a nonconservative TS value for Units 1 and 2. Two issues require the proposed change. The first issue concerns the Unit 2 Centrifugal Charging Pump (CCP) rotating elements which could result in the actual brake horsepower (BHP) exceeding the nameplate maximum horsepower rating of the CCP motor. The second issue concerns evaluations of the DG load calculations for both Units 1 and 2, indicating that all four DGs could be overloaded if operated at the maximum steady-state frequency of 61.2 Hz as currently allowed by TS 3.8.1. The licensee identified that the Unit 2 CCP motors can be overloaded if the frequency is allowed to reach 61.2 Hz, the current maximum steady-state frequency limit in TS 3.8.1 SRs, with the pump operating at or near the runout flow rate. This flow rate can be demanded from the CCP in response to a large-break or small-break LOCA. The nameplate allowable continuous load with the service factor on the CCP motors is 690 horsepower (hp) (600 hp, 1.15 service factor). A CCP operating at 61.2 Hz at or near the runout flow rate would exceed 690 BHP. The licensee validated that this BHP concern is limited to the Unit 2 CCPs as a result of the newly installed rotating elements.

The licensee evaluated the DG loading at several frequencies between 60 Hz and 61.2 Hz using the Units 1 and 2 auxiliary power system model calculations. The evaluation determined that, at the TS maximum steady-state frequency of 61.2 Hz, the DGs would become overloaded.

The licensee determined that 60.5 Hz, as the maximum frequency, will ensure the required BHP is within the rating of the Unit 2 CCP motors and prevent overloading the DGs. Since, an upper limit of 60.5 Hz value results in a more restrictive allowable frequency band compared to the upper limit of 61.2 Hz in the current TS, the revised maximum steady-state frequency limit will have no adverse affect on other components, such as motor-operated valves, fans, pumps, and non-motorized equipment. Therefore, DG operation within the new more restrictive frequency range will maintain operability of the engineered safety features systems equipment required for the safe shutdown of the facility and for mitigation and control of accident conditions when powered by the DG. The licensee applied administrative controls on the TS surveillance acceptance criteria for Units 1 and 2 to limit the maximum steady-state frequency to 60.5 Hz.

The licensee stated that Woodward Model 2301A, load sharing and speed control with dual dynamics, is used as the DG electronic governing systems. Design specifications for this equipment indicate a steady-state speed band of ± 0.25 percent of rated speed. The control is set as close as practical for the DG rated speed of 514 revolutions per minute (rpm), which is equivalent to 60 Hz. As such, the equipment is nominally capable of maintaining DG speed at 514 rpm ± 1.3 rpm, or 60 Hz ± 0.15 Hz. This is well within the proposed allowable band of 59.4 Hz to 60.5 Hz. Historical surveillance data confirmed that the DG governors are generally capable of maintaining frequency within the band of 0.25 percent of rated speed.

In response to the staff request for additional information, the licensee, in its letter dated April 28, 2008, stated that frequency measurement uncertainty is accounted for in the TS surveillance procedures. A 0.1 Hz measurement uncertainty is incorporated into the applicable TS surveillance procedures, i.e., the procedural acceptance criteria for the proposed TS maximum value of 60.5 Hz is 60.4 Hz. The licensee also confirmed that based on the DG loading calculations, DG "1-CD" (Train A) can be subjected to the bounding load of 3462 kW at 60.5 Hz in the LOOP with Containment Spray scenario, and still be within the 3500 kW rating of the DG.

The staff reviewed the licensee's justification of the proposed TS change of maximum steadystate frequency from 61.5 Hz to 60.5 Hz, and additional information provided by the licensee in its letter dated April 28, 2008. Since a maximum frequency of 60.5 Hz is more conservative than the current TS limit of 61.2 Hz, and the DG governor system can maintain the frequency with the narrower range, the proposed change to maximum steady-state frequency of DG in the TS are considered acceptable.

3.3 Evaluation of Proposed Change to Minimum Steady-State Voltage

During the review of maximum steady-state frequency changes, the NRC staff identified that the DG voltage (3740 V) at 10 seconds after the DG start (currently specified in TS) was nonconservative and inconsistent with the 3910 V minimum steady-state voltage provided in other parts of the SRs of TS 3.8.1 (such as SR 3.8.1.8, SR 3.8.1.13 etc.). The licensee was asked to provide calculations, or portions thereof, which show that the existing minimum TS-required voltage (3740 V at \leq 10 seconds) is adequate for operation of first block of load which will be connected at 10 seconds in the case of a design-basis accident or to amend the TS to require the minimum voltage at \leq 10 seconds to be \geq 3910 V.

In response to the staff's concern, the licensee elected to submit a supplement to propose a TS change to increase the DG voltage that must be achieved in ≤ 10 seconds from $\geq 3740 \lor$ to $\geq 3910 \lor$ instead of performing and providing the necessary calculation to support the lower voltage requirement. The value of $\geq 3910 \lor$ corresponds to the minimum DG steady-state voltage specified in other SRs of TS 3.8.1. The additional changes, mainly to address the minimum DG voltage at ≤ 10 seconds, were submitted by the licensee on September 4, 2008. In their supplemental letter dated September 4, 2008, the licensee proposed the following additional changes:

Change to Minimum DG Voltage that Must Be Achieved Within 10 Seconds (SR 3.8.1.8.a, SR 3.8.1.13.a, SR 3.8.1.16.a, and SR 3.8.1.22)

The licensee proposed to increase the minimum DG voltage that must be achieved within 10 seconds from $\ge 3740 \lor$ to $\ge 3910 \lor$. In response to the staff question, the licensee in its letter dated April 28, 2008, stated that 3910 \lor is the minimum bus voltage required for component operability. The proposed changes resolve the staff concern regarding the minimum DG voltage that must be achieved in ≤ 10 seconds. The value of 3910 \lor is also consistent with the minimum steady-state voltage specified in other SRs of TS 3.8.1.

Change to Minimum DG Frequency that Must Be Achieved Within 10 Seconds (SR 3.8.1.8.a, SR 3.8.1.13.a, SR 3.8.1.16.a, and SR 3.8.1.22)

The licensee proposed to change the minimum DG frequency that must be achieved within 10 seconds from 58.8 Hz to 59.4 Hz to be consistent with minimum steady-state frequency specified as 59.4 Hz in other SRs of TS 3.81. This change is analogous to the DG minimum voltage that must be achieved within 10 seconds.

The staff agrees that this change is more conservative, and consistent with the minimum value of steady-state frequency specified in other SRs of TS 3.8.1. This change will ensure adequate frequency to first block of load which will be connected at 10 seconds in the case of a design-basis accident.

Change to Maximum DG Frequency Allowed Within 2 Seconds Following Rejection of the Single Largest Post-Accident Load (SR 3.8.1.10.c)

The licensee proposed to change the maximum DG frequency specified in SR 3.8.1.10.c, allowed within 2 seconds following rejection of the single largest post-accident load, from 61.2 Hz to 60.5 Hz. This change is consistent with the maximum DG steady-state frequency limit specified in other SRs of TS 3.8.1.

In the TS bases, the licensee stated that 2 seconds specified is equal to approximately 60 percent of the 3.49 second load sequence interval associated with sequencing of the largest load. The purpose is to ensure that the DG frequency returns to within the allowable frequency band before the next load is applied. SR 3.8.1.10.c provides the maximum steady-state frequency to which the system must recover within 2 seconds following load rejection.

The staff asked the licensee to justify the 3.49 second load sequence interval, and the resulting 2 seconds for the frequency to return within allowable band. In its response dated December 17, 2008, the licensee provided the following explanation.

The updated final safety analysis report Section 8.4 provides nominal load sequence times (rather than actual setpoints). The sequencing relay required setpoint for the centrifugal charging pump is 3.16 seconds. When added to the 10 second DG start time, the load sequence time is 13.16 seconds. The next load to sequence on the DG is the safety injection pump. The sequencing relay required setpoint for the safety injection pump is 6.65 seconds, resulting in a load sequence time of 16.65 seconds. The referenced 3.49 second load sequence interval is 16.65 - 13.16 = 3.49 seconds. The 2 second recovery time is based on 60 percent of the 3.49 second interval, i.e., $0.6 \times 3.49 = 2.09$ seconds, or approximately 2 seconds. For the purposes of the test, rounding down is conservative (i.e., a faster voltage and frequency recovery enhances the ability of the machine to accept the next sequenced load within allowable voltage and frequency limits).

The staff agrees that the above described change is more conservative, and consistent with the general recommendation provided in R.G. 1.9. The change is also consistent with the maximum steady-state frequency specified in other SRs of TS 3.8.1.

3.4 <u>Summary</u>

The NRC staff has reviewed the licensee's changes to the TS 3.8.1 SRs proposed in the letters dated June 27, 2007, and September 4, 2008. The changes are conservative with respect to the current TSs, and resolve the additional staff concerns identified during review of the initial TS amendment request dated June 27, 2007. Based on its review as discussed above, the staff considers the proposed changes to be acceptable, and that the licensee will continue to meet the requirements of 10 CFR 50.36(c).

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

The proposed amendment changes surveillance requirements. The staff has determined that the amendment involves no significant hazards consideration; there is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite; and there is no significant increase in individual or cumulative occupational radiation exposure. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). The Commission has previously issued proposed findings that the amendment involves no significant hazards consideration and there has been no public comment on such finding (72 FR 45458 and 73 FR 65696). 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 <u>CONCLUSION</u>

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: Vijay Goel

Date: April 30, 2009

Mr. Joseph N. Jensen 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, UNITS 1 and 2 - ISSUANCE OF AMENDMENT TO RENEWED FACILITY OPERATING LICENSE REGARDING TECHNICAL SPECIFICATION CHANGE RELATING TO DIESEL GENERATOR STEADY-STATE PARAMETERS (TAC NOS. MD8773 and MD8774)

Dear Mr. Jensen:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment Nos. 309 and 291 to Renewed Facility Operating License Nos. DPR-58 and DPR-74 for the Donald C. Cook Nuclear Plant, Units 1 and 2, respectively. The amendment changes the Technical Specifications (TS) in response to your application dated June 27, 2007, as supplemented by letters dated April 28, September 4, and December 17, 2008.

The amendment modifies TS Section 3.8.1, "AC [alternating current] Sources – Operating." The amendment also affects TS Section 3.8.2, "AC Sources – Shutdown," in that certain surveillance requirements from Section 3.8.1 are necessary to ensure operability of AC sources when shutdown. The changes are necessary to correct a non-conservative TS value.

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

Sincerely, /RA/ Terry A. Beltz, Senior Project Manager Plant Licensing Branch III-1 Division of Operating Reactor Licensing Office of Nuclear Reactor Regulation

Docket Nos. 50-315 and 50-316

Enclosures: 1. Amendment No. 309 to DPR-58 2. Amendment No. 291 to DPR-74 3. Safety Evaluation

cc w/encls: Distribution via ListServ

DISTRIBUTION: PUBLIC LPL3-1 R/F RidsAcrsAcnw_MailCTR Resource RidsDirsItsb Resource RidsNrrDorlLpl3-1 Resource

RidsNrrPMTBeltz Resource RidsNrrLATHarris Resource RidsNrrLABTully Resource RidsRgn3MailCenter Resource RidsOgcRp Resource RidsNrrDorlDpr Resource RidsNrrDeEeeb Resource VGoel, NRR G. Hill(4)

Amendment Accession Number: ML090630245

*SE transmitted by memo of 01/07/2009

OFFICE	LPL3-1/PM	LPL3-1/PM	LPL3-1/LA	EEEB/BC	OGC	LPL3-1/BC
NAME	TBeltz	PTAM	THarris	GWilson *	BHarris	LJames
DATE	03/10/09	04/15/09	03/13/09	01/07/09	04/09/09	04/30/09

OFFICIAL RECORD COPY