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INDIANA MICHIGAN POWER

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

Donald C. Cook Nuclear Plant Units 1 and 2
ANNUAL REPORT OF LOSS-OF-COOLANT ACCIDENT
EVALUATION MODEL CHANGES

Reference: Letter from S. A. Greenlee, Indiana Michigan Power Company, to U. S. Nuclear Regulatory Commission Document Control Desk, "Donald C. Cook Nuclear Plant Units 1 and 2 Annual Report of Loss-Of-Coolant Accident Evaluation Model Changes," dated August 31, 2001

Pursuant to 10 CFR 50.46, Indiana Michigan Power Company (I&M), the licensee for the Donald C. Cook Nuclear Plant (CNP), is transmitting an annual report of loss-of-coolant accident (LOCA) model changes affecting the peak cladding temperature (PCT) for CNP Units 1 and 2. Attachment 1 to this letter describes the current assessments against the large break and small break LOCA analyses of record. Attachment 2 provides the large break and small break LOCA analyses of record PCT values and error assessments. Attachment 2 also demonstrates that all PCT values remain within the 2200 degree Fahrenheit PCT limit specified in 10 CFR 50.46(b)(1).

There are no new PCT assessments against the Unit 1 limiting large break, Unit 1 limiting small break, Unit 2 limiting large break, and Unit 2 limiting small break LOCA analyses of record. Therefore, no assessments are classified as significant in accordance with 10 CFR 50.46(a)(3)(i).

Because the previously reported changes to the Unit 1 limiting small break, the Unit 2 limiting large break, and Unit 2 limiting small break analyses of record were classified as significant, I&M submitted a schedule for performing new analyses in the referenced letter. I&M originally planned to complete the Unit 2 small break LOCA and large break LOCA analyses to support the CNP power uprate. I&M has subsequently contracted with a different fuel vendor, and will

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complete the power uprate analyses with the new vendor. A revised schedule for reanalysis of each of these events is provided in Attachment 3.

Should you have any questions, please contact Mr. Brian A. McIntyre, Manager of Regulatory Affairs, at (269) 697-5806.

Sincerely,

John A. Zwolinski
Director of Design Engineering and Regulatory Affairs

DB/rdw

Attachments

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J. E. Newmiller
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M. K. Scarpello, w/o attachments
T. K. Woods, w/o attachments
J. A. Zwolinski, w/o attachments

ATTACHMENT 1 TO AEP:NRC:3046

ASSESSMENTS AGAINST THE LOSS-OF-COOLANT ACCIDENT (LOCA) ANALYSES OF RECORD

Indiana Michigan Power Company (I&M) previously submitted the annual 10 CFR 50.46 report for Donald C. Cook Nuclear Plant (CNP) Units 1 and 2 in the referenced letter. The reported analysis of record peak cladding temperature (PCT) values in Attachment 2 of this letter remain the same as reported in the referenced letter, as no new loss-of-coolant accident (LOCA) analyses have been performed. There are no new PCT assessments against the CNP Units 1 and 2 large break LOCA or small break LOCA analyses of record. Current assessments against the analysis of record are reflected in the PCT accounting in Attachment 2. This transmittal satisfies the annual reporting requirement of 10 CFR 50.46(a)(3)(ii).

Reference:

Letter from S. A. Greenlee, Indiana Michigan Power Company to U. S. Nuclear Regulatory Commission Document Control Desk, "Donald C. Cook Nuclear Plant Units 1 and 2, Annual Report of Loss-of-Coolant Accident Evaluation Model Changes," submittal AEP:NRC:2046-01, dated August 15, 2002

ATTACHMENT 2 TO AEP:NRC:3046

DONALD C. COOK NUCLEAR PLANT UNITS 1 AND 2
LARGE AND SMALL BREAK LOSS-OF-COOLANT ACCIDENT
PEAK CLAD TEMPERATURE SUMMARY

TABLE 1

CNP UNIT 1

LARGE BREAK LOCA

Evaluation Model: BASH
F_Q=2.15 $F_{\Delta H}$=1.55 SGTP=15% Break Size: C_d=0.4
Operational Parameters: RHR System Cross-Tie Valves Closed, 3250[1] MWt Reactor Power
Notes: ZIRLO clad, IFM grids

LICENSING BASIS		
	Analysis-of-Record, December 2000	PCT= 2038°F
MARGIN ALLOCATIONS (Δ PCT)		
A.	PREVIOUS 10 CFR 50.46 ASSESSMENTS[2]	
	1. LOCBART Cladding Emissivity Errors[3]	-11°F
	2. Reduced Containment Spray Temperature	+23°F
B.	NEW 10 CFR 50.46 ASSESSMENTS	0°F
C.	OTHER	
	1. Transition Core Penalty[4]	+31°F
D.	LICENSING BASIS PCT+ MARGIN ALLOCATIONS	PCT= 2081°F

[1] The 3250 MWt power level used in the reanalysis bounds the Unit 1 3304 MWt steady state power limit in the operating license crediting recapture of feedwater flow measurement and power calorimetric uncertainty.

[2] ECCS model assessments are no longer being listed by year of occurrence. Instead the errors are being identified by error type. This is consistent with Westinghouse reporting methods and does not change the overall PCT.

[3] This is a revised assessment. The prior generic assessment of +6°F has been changed to -11°F based on plant specific information.

[4] This penalty will be dropped once all fuel assemblies include the Intermediate Flow Mixing (IFM) Grids.

TABLE 2

CNP UNIT 1

SMALL BREAK LOCA

Evaluation Model: NOTRUMP
F_Q=2.32 $F_{\Delta H}$=1.55 SGTP=30% 3″ cold leg break
Operational Parameters: SI System Cross-Tie Valves Closed, 3250[1] MWt Reactor Power
Notes: ZIRLO clad, IFM grids

LICENSING BASIS			
	Analysis-of-Record, December 2000		PCT= 1720°F
MARGIN ALLOCATIONS (Δ PCT)			
A.	PREVIOUS 10 CFR 50.46 ASSESSMENTS[2]		
	1.	Asymmetric HHSI Delivery	+50°F
	2.	Reduction in Turbine Driven Auxiliary Feedwater Flow	+109°F
	3.	Burst and Blockage / Time in Life	+111°F
B.	NEW 10 CFR 50.46 ASSESSMENTS		0°F
C.	OTHER		0°F
D.	LICENSING BASIS PCT+ MARGIN ALLOCATIONS		PCT= 1990°F

[1] The 3250 MWt power level used in the reanalysis bounds the Unit 1 3304 MWt steady state power limit in the operating license crediting recapture of feedwater flow measurement and power calorimetric uncertainty.

[2] ECCS model assessments are no longer being listed by year of occurrence. Instead the errors are being identified by error type. This is consistent with Westinghouse reporting methods and does not change the overall PCT.

TABLE 3

CNP UNIT 2

LARGE BREAK LOCA

Evaluation Model: BASH
F_Q=2.335 $F_{\Delta H}$=1.64 SGTP=15% Break Size: C_d=0.6
Operational Parameters: RHR System Cross-Tie Valves Closed, 3413 MWt Reactor Power[1]

LICENSING BASIS			
	Analysis-of-Record, December 1995[1]		PCT= 2051°F
MARGIN ALLOCATIONS (Δ PCT)			
A.	PREVIOUS 10 CFR 50.46 ASSESSMENTS[2]		
	1.	ECCS double disk valve leakage	+8°F
	2.	BASH current limiting break size reanalysis to incorporate LOCBART spacer grid single phase heat transfer and LOCBART zirc-water oxidation error[1]	+58°F
	3.	Cycle 13 ZIRLO Fuel Evaluation[3]	-50°F
	4.	Reduced Containment Spray Temperature	+47°F
B.	NEW 10 CFR 50.46 ASSESSMENTS		0°F
C.	OTHER		0°F
D.	LICENSING BASIS PCT+ MARGIN ALLOCATIONS		PCT= 2114°F

[1] Power level used as basis for PCT acceptance is 3413 MWt due to the reanalysis (see item A.2) to provide an integrated error effect on the limiting case. This reanalysis (item A.2) is not considered the analysis-of-record due to the spectrum of break sizes not being reanalyzed to ensure that the limiting break size at 3413 MWt with the errors incorporated would not change. Thus, the analysis-of-record remains as the 1995 analysis at a power level of 3588 MWt. The difference between the limiting case PCT (2051°F) and the PCT from the reanalysis of that limiting break size at 3413 MWt is the 58°F being reported. The 3413 MWt power level used in the reanalysis bounds the Unit 2 3468 MWt steady state power limit in the operating license crediting recapture of feedwater flow measurement and power calorimetric uncertainty.

[2] ECCS model assessments are no longer being listed by year of occurrence. Instead the errors are being identified by error type. This is consistent with Westinghouse reporting methods and does not change the overall PCT.

[3] The ZIRLO fuel evaluation used a version of LOCBART that corrected for the Vapor Film Flow Regime Heat Transfer and Cladding Emissivity Errors. As reported in previous reports, these errors were -15°F and -10°F respectively. Thus, since this reanalysis incorporates the errors previously reported, the errors are no longer being reported individually.

TABLE 4

CNP UNIT 2

SMALL BREAK LOCA

Evaluation Model: NOTRUMP
F_Q=2.45 $F_{\Delta H}$=1.666 SGTP=15% 3″ cold leg break
Operational Parameters: SI System Cross-Tie Valves Closed, 3250 MWt Reactor Power[1]

LICENSING BASIS			
	Analysis-of-Record, March 1992		PCT= 1956°F
MARGIN ALLOCATIONS (Δ PCT)			
A.	PREVIOUS 10 CFR 50.46 ASSESSMENTS[2]		
	1.	Limiting NOTRUMP and SBLOCA analysis[3]	-214°F
	2.	Burst and blockage / time in life	+60°F
	3.	Asymmetric HHSI Delivery	+50°F
	4.	NOTRUMP mixture level tracking/region depletion errors	+13°F
B.	NEW 10 CFR 50.46 ASSESSMENTS		0°F
C.	OTHER		0°F
D.	LICENSING BASIS PCT+ MARGIN ALLOCATIONS		PCT= 1865°F

[1] Unit 2 is licensed to a 3468 MWt steady-state power level. However, 3304 MWt is assumed for the small break LOCA analysis with the SI system cross-tie valves closed after adjusting for recapture of feedwater flow measurement and power calorimetric uncertainty. This is because Unit 2 Technical Specification 3.5.2 limits thermal power to 3304 MWt with a safety injection cross-tie valve closed. The 3250 MWt power level used in the reanalysis bounds the Unit 2 3304 MWt steady state power limit in the operating license crediting recapture of feedwater flow measurement and power calorimetric uncertainty.

[2] ECCS model assessments are no longer being listed by year of occurrence. Instead the errors are being identified by error type. This is consistent with Westinghouse reporting methods and does not change the overall PCT.

[3] This reanalysis is considered an evaluation because a full spectrum of break sizes was not analyzed. This reanalysis incorporated the errors previously reported (Letter from M. W. Rencheck, Indiana Michigan Power Company to Nuclear Regulatory Commission Document Control Desk, "Donald C. Cook Nuclear Plant Unit 2 Annual Report of Loss-of-Coolant Accident Evaluation Model Changes," submittal C1000-07, dated October 27, 2000) in the individual years in which they occurred. The difference between the analysis-of-record limiting break size PCT and the reanalysis PCT is -214°F. Thus, since this reanalysis incorporates the errors previously reported, the errors are no longer being reported individually. Note that this does not impact the resulting PCT as it remains at 1865°F. It is only an accounting change.

TABLE 5

CNP UNIT 2

SMALL BREAK LOCA

Evaluation Model: NOTRUMP
F_Q=2.32 $F_{\Delta H}$=1.62 SGTP=15% 4″ cold leg break
Operational Parameters: SI System Cross-Tie Valves Open, 3588[1] MWt Reactor Power

LICENSING BASIS			
	Analysis-of-Record, August 1992		PCT= 1531°F
MARGIN ALLOCATIONS (Δ PCT)			
A.	PREVIOUS 10 CFR 50.46 ASSESSMENTS[2]		
	1.	Effect of SI in Broken Loop	+150°F
	2.	Effect of Improved Condensation Model	-150°F
	3.	Drift Flux Flow Regime Errors	-13°F
	4.	LUCIFER Error Corrections	-16°F
	5.	Containment Spray During Small Break LOCA	+20°F
	6.	Boiling Heat Transfer Correlation Error	-6°F
	7.	Steam Line Isolation Logic Error	+18°F
	8.	Axial Nodalization, and SBLOCTA correction	+3°F
	9.	NOTRUMP Specific Enthalpy Error	+20°F
	10.	SBLOCTA Fuel Rod Initialization Error	+10°F
	11.	Loop Seal Elevation Error	-38°F
	12.	NOTRUMP Mixture Level Tracking / Region Depletion Errors	+13°F
B.	NEW 10 CFR 50.46 ASSESSMENTS		0°F
C.	OTHER		0°F
D.	LICENSING BASIS PCT+ MARGIN ALLOCATIONS		PCT= 1542°F

[1] The 3588 MWt power level used in the reanalysis bounds the Unit 2 3468 MWt steady state power limit in the operating license crediting recapture of feedwater flow measurement and power calorimetric uncertainty.

[2] ECCS model assessments are no longer being listed by year of occurrence. Instead the errors are being identified by error type. This is consistent with Westinghouse reporting methods and does not change the overall PCT.

ATTACHMENT 3 TO AEP:NRC:3046

COMMITMENTS

The following table identifies those actions committed to by Indiana Michigan Power Company (I&M) in this document. Any other actions discussed in this submittal represent intended or planned actions by I&M. They are described to the Nuclear Regulatory Commission (NRC) for the NRC's information and are not regulatory commitments.

Commitment	Date
A new Unit 2 SBLOCA analysis of both the safety injection cross-tie valves closed case and the safety injection cross-tie valves open case will be submitted.	Startup for Unit 2 Cycle 16.
A new Unit 2 LBLOCA analysis will be submitted.	Startup for Unit 2 Cycle 16.