



**INDIANA  
MICHIGAN  
POWER®**

A unit of American Electric Power  
August 31, 2007

**Indiana Michigan Power**  
Cook Nuclear Plant  
One Cook Place  
Bridgman, MI 49106  
AEP.com

AEP:NRC:7046-02  
10 CFR 50.46

Docket Nos.: 50-315  
50-316

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

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

Reference: Letter from M. A. Peifer, Indiana Michigan Power Company, to U. S. Nuclear Regulatory Commission Document Control Desk, "Donald C. Cook Nuclear Plant Units 1 and 2, Thirty-Day Report For Loss-Of-Coolant Accident Evaluation Model Changes," AEP:NRC:7046-01, dated June 15, 2007.

Pursuant to 10 CFR 50.46, Indiana Michigan Power Company (I&M), the licensee for 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. The attachment to this letter provides the Unit 1 and Unit 2 large break and small break LOCA analyses of record PCT values and error assessments.

By the referenced letter, I&M submitted a schedule for reanalysis of the Unit 1 and Unit 2 small break LOCA and the Unit 2 large break LOCA analyses of record. These schedules remain unchanged.

There are no new commitments in this submittal. Should you have any questions, please contact me at (269) 466-2428.

Sincerely,

Susan D. Simpson  
Regulatory Affairs Manager

RSP/rdw

Attachment (5 pages)

ADD1  
NRR

c: J. L. Caldwell, NRC Region III  
K. D. Curry - AEP Ft. Wayne, w/o attachment  
J. T. King - MPSC, w/o attachment  
MDEQ – WHMD/RPMWS  
NRC Resident Inspector  
P. S. Tam – NRC Washington, DC

ATTACHMENT TO AEP:NRC:7046-02

DONALD C. COOK NUCLEAR PLANT (CNP) 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 MWt Reactor Power <sup>1</sup>			

LICENSING BASIS

Analysis-of-Record, December 2000

PCT = 2038°F

MARGIN ALLOCATIONS (Delta PCT)

A.	PREVIOUS 10 CFR 50.46 ASSESSMENTS	
	1. LOCBART Cladding Emissivity Errors	-11°F
	2. Rebaseline Using PAD 4.0	+57°F
	3. LOCBART Pellet Volumetric Heat Generation Rate Error	+11°F
B.	PLANNED 50.59 PLANT CHANGE EVALUATIONS	
	1. Reduced Containment Spray Temperature	+23°F
	2. 15X15 Upgrade Fuel	-59°F
C.	New 10 CFR 50.46 ASSESSMENTS	
	1. None	0°F
D.	OTHER	
	1. None	0°F
E.	LICENSING BASIS PCT + MARGIN ALLOCATIONS	PCT = 2059°F

<sup>1</sup> The 3250 MWt power level used in the reanalysis is acceptable because it bounds the Unit 1 3304 MWt steady state power limit in the operating license after adjusting for recapture of feedwater flow measurement and power calorimetric uncertainty.

TABLE 2  
CNP UNIT 1  
SMALL BREAK LOCA

Evaluation Model: NOTRUMP			
$F_Q = 2.32$	$F_{\Delta H} = 1.55$	SGTP = 10%	3.25" cold leg break
Operational Parameters: SI System Cross-Tie Valves Closed, 3304 MWt Reactor Power			

LICENSING BASIS

Analysis-of-Record, March 2007

PCT = 1725°F

MARGIN ALLOCATIONS (DELTA PCT)

A.	PREVIOUS 10 CFR 50.46 ASSESSMENTS	
1.	None	0°F
B.	PLANNED PLANT MODIFICATION EVALUATIONS	
1.	None	0°F
C.	NEW 10 CFR 50.46 ASSESSMENTS	
1.	None	0°F
D.	OTHER	
1.	None	0°F
E.	LICENSING BASIS PCT + MARGIN ALLOCATIONS	PCT = 1725°F

TABLE 3  
CNP UNIT 2  
LARGE BREAK LOCA

Evaluation Model: BASH			
$F_Q = 2.335$	$F_{\Delta H} = 1.644$	SGTP = 15%	Break Size: $C_d = 0.6$
Operational Parameters: RHR System Cross-Tie Valves Closed, 3413 MWt Reactor Power <sup>2</sup>			

## LICENSING BASIS

Analysis-of-Record, December 1995

PCT = 2051°F

## MARGIN ALLOCATIONS (Delta PCT)

## A. PREVIOUS 10 CFR 50.46 ASSESSMENTS

- |   |       |
|---|-------|
| 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 | +58°F |
| 3. LOCBART Pellet Volumetric Heat Generation Rate Error   | +16°F |
| 4. Rebaseline of Limiting LOCBART Calculation   | +9°F  |

## B. PLANNED 50.59 PLANT CHANGE EVALUATIONS

- |  |       |
|--|-------|
| 1. Cycle 13 ZIRLO Fuel Evaluation        | -50°F |
| 2. Reduced Containment Spray Temperature | +47°F |

## C. New 10 CFR 50.46 ASSESSMENTS

- |         |     |
|---------|-----|
| 1. None | 0°F |
|---------|-----|

## D. OTHER

- |         |           |
|---------|-----------|
| 1. None | _____ 0°F |
|---------|-----------|

## E. LICENSING BASIS PCT + MARGIN ALLOCATIONS

PCT = 2139°F

<sup>2</sup> 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 is acceptable because it bounds the Unit 2 3468 MWt steady state power limit in the operating license after adjusting for recapture of feedwater flow measurement and power calorimetric uncertainty.

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 <sup>3</sup>			

## LICENSING BASIS

Analysis-of-Record, March 1992

PCT = 1956°F

## MARGIN ALLOCATIONS (DELTA PCT)

A.	PREVIOUS 10 CFR 50.46 ASSESSMENTS	
1.	Limiting NOTRUMP and Small Break LOCA analysis	-214°F
2.	Burst and blockage / time in life	+95°F
3.	Asymmetric HHSI Delivery	+50°F
4.	NOTRUMP mixture level tracking / region depletion errors	+13°F
5.	NOTRUMP Bubble Rise / Drift Flux Model Inconsistency Corrections	+35°F
B.	PLANNED 50.59 PLANT CHANGE EVALUATIONS	
1.	Artificial Leak-By	+12°F
C.	NEW 10 CFR 50.46 ASSESSMENTS	
1.	None	0°F
D.	OTHER	
1.	None	0°F
E.	LICENSING BASIS PCT + MARGIN ALLOCATIONS	PCT = 1947°F

<sup>3</sup> 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 safety injection (SI) system cross-tie valves closed. This is because Unit 2 Technical Specification 3.5.2 limits thermal power to 3304 MWt with a SI cross-tie valve closed. The 3250 MWt power level used in the reanalysis is acceptable because it bounds the Unit 2 3304 MWt steady state power limit in the operating license after adjusting for recapture of feedwater flow measurement and power calorimetric uncertainty.

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 MWt Reactor Power			

## LICENSING BASIS

Analysis-of-Record, August 1992

PCT = 1531°F

## MARGIN ALLOCATIONS (DELTA PCT)

A.	PREVIOUS 10 CFR 50.46 ASSESSMENTS	
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 Small Break LOCA correction	+3°F
9.	NOTRUMP Specific Enthalpy Error	+20°F
10.	Small Break LOCA Fuel Rod Initialization Error	+10°F
11.	Loop Seal Elevation Error	-38°F
12.	NOTRUMP Mixture Level Tracking / Region Depletion Errors	+13°F
13.	NOTRUMP Bubble Rise / Drift Flux Model Inconsistency Corrections	+35°F
B.	PLANNED 50.59 PLANT CHANGE EVALUATIONS	
1.	Artificial Leak-By	+12°F
C.	NEW 10 CFR 50.46 ASSESSMENTS	
1.	None	0°F
D.	OTHER	
1.	None	0°F
E.	LICENSING BASIS PCT + MARGIN ALLOCATIONS	PCT = 1589°F