INDIANA MICHIGAN POWER

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AEP-NRC-2009-54
10 CFR 50.46

Docket Nos.: 50-315
50-316

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

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

References:

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

2. Letter from L. J. Weber, I&M, to NRC Document Control Desk, "Donald C. Cook Nuclear Plant Unit 2, Docket No. 50-316, License Amendment Request Regarding Large Break Loss-of-Coolant Accident Analysis Methodology," AEP-NRC-2009-23, dated March 19, 2009.

3. Letter from R. A. Hruby, Jr., I&M, to NRC Document Control Desk, "Donald C. Cook Nuclear Plant Unit 2, Small Break Loss-of-Coolant Accident Evaluation Model Reanalysis," AEP-NRC-2009-25, dated March 30, 2009.

4. Letter from J. N. Jensen, I&M, to NRC Document Control Desk, "Donald C. Cook Nuclear Plant Unit 1, Docket No. 315, License Amendment Request Regarding Large Break Loss-of-Coolant Accident Analysis Methodology," AEP:NRC:7565-01, dated December 27, 2007.

5. Letter from L. J. Weber, I&M, to NRC Document Control Desk, "Donald C. Cook Nuclear Plant Unit 1 Response to Request for Additional Information Regarding Reanalysis of Large Break Loss-of-Coolant Accident (TAC No. MD7556)," AEP-NRC-2008-10, dated July 14, 2008.

6. Letter from T. A. Beltz, NRC, to M. W. Rencheck, I&M, "Donald C. Cook Nuclear Plant Unit 1 – Issuance of Amendment to Renewed Facility Operating License Regarding Use of the Westinghouse ASTRUM Large Break Loss-of-Coolant Accident Analysis Methodology (TAC No. MD7556)," dated October 17, 2008.

A001
NRR

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 enclosure 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 Reference 1, I&M submitted a schedule for reanalysis of the Unit 2 small and large break LOCA analysis of record. The Unit 2 small break LOCA analysis has been submitted by Reference 3, and the Unit 2 large break LOCA analysis was submitted for Nuclear Regulatory Commission (NRC) review and approval by Reference 2. The Unit 1 large break LOCA analysis presented here is new. It was submitted by Reference 4 and supplemented by Reference 5. NRC approval of the new Unit 1 large break LOCA analysis is documented in Reference 6. There has been no 30-day reports submitted since the last annual report.

There are no new or revised commitments in this letter. Should you have any questions, please contact Mr. James M. Petro, Jr., Regulatory Affairs Manager, at (269) 466-2489.

Sincerely,

R. A. Hruby, Jr.

Raymond A. Hruby, Jr.
Vice President - Site Support Services

RSP/rdw

Enclosure

c: T. A. Beltz – NRC Washington, DC
J. T. King – MPSC, w/o attachment
S. M. Krawec – AEP Ft. Wayne, w/o attachment
MDEQ – WHMD/RPS
NRC Resident Inspector
M. A. Satorius – NRC Region III

ENCLOSURE TO AEP-NRC-2009-54

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

CNP UNIT 1
LARGE BREAK LOCA

Evaluation Model: ASTRUM

$F_Q = 2.15$ $F_{\Delta H} = 1.55$ SGTP = 10% Break Size: Split

Operational Parameters: 3304 MWt Reactor Power

LICENSING BASIS

Analysis-of-Record, October 2008 Analysis details in WCAP-16843-P, November 2008		PCT = 2128°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 = 2128°F

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

CNP UNIT 2
LARGE BREAK LOCA
Scenario 1

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[1]

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[2]	+25°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	0°F
D.	OTHER	0°F
E.	LICENSING BASIS PCT + MARGIN ALLOCATIONS	PCT = 2139°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 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.

2. Includes 9°F penalty due to rebaselining of the limiting LOCBART calculation.

CNP UNIT 2
LARGE BREAK LOCA
Scenario 2

Evaluation Model: BASH

$F_Q = 2.335$ $F_{\Delta H} = 1.644$ SGTP = 15%[3] Break Size: $C_d = 0.6$

Operational Parameters: RHR System Cross-Tie Valves Closed, 3413 MWt Reactor Power[4]

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	+14°F
	4. Increased Accumulator Water Temperature Evaluation[3]	+27°F
B.	PLANNED 50.59 PLANT CHANGE EVALUATIONS	
	1. Cycle 13 ZIRLO Fuel Evaluation	-50°F
C.	New 10 CFR 50.46 ASSESSMENTS	0°F
D.	OTHER	0°F
E.	LICENSING BASIS PCT + MARGIN ALLOCATIONS	PCT = 2108°F

3. Margin allocation A.4 utilized a reduced SGTP of one percent.

4. 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.

CNP UNIT 2

SMALL BREAK LOCA

Evaluation Model: NOTRUMP

$F_Q = 2.451$ $F_{\Delta H} = 1.667$ SGTP = 10% 3.5″ cold leg break

Operational Parameters: SI System Cross-Tie Valves Closed, 3304 MWt Reactor Power[1]

LICENSING BASIS		
	Analysis-of-Record, February, 2009	PCT = 1722°F
MARGIN ALLOCATIONS (DELTA PCT)		
A.	PREVIOUS 10 CFR 50.46 ASSESSMENTS	
	1. None	0°F
B.	PLANNED 50.59 PLANT CHANGE 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 = 1722°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 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 an SI cross-tie valve closed.

CNP UNIT 2

SMALL BREAK LOCA

Evaluation Model: NOTRUMP

$F_Q = 2.32$ $F_{\Delta H} = 1.62$ SGTP = 10% 8.75″ cold leg break

Operational Parameters: SI System Cross-Tie Valves Open, 3600 MWt Reactor Power

LICENSING BASIS		
	Analysis-of-Record, February, 2009	PCT = 1691°F
MARGIN ALLOCATIONS (DELTA PCT)		
A.	PREVIOUS 10 CFR 50.46 ASSESSMENTS	
	1. None	0°F
B.	PLANNED 50.59 PLANT CHANGE 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 = 1691°F