

CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9801230308 DOC. DATE: 98/01/16 NOTARIZED: NO DOCKET #
 FACIL: 50-315 Donald C. Cook Nuclear Power Plant, Unit 1, Indiana M 05000315
 AUTH. NAME AUTHOR AFFILIATION
 MALIN, D. Indiana Michigan Power Co.
 SAMPSON, J.R. Indiana Michigan Power Co.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 97-027-01: on 971028, both units had potential to be
 outside design basis & possibly in noncompliance w/
 10CFR50.46(b)(2). Cause is under investigation. Comprehensive
 plan developed. W/980116 ltr.

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 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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Indiana Michigan
Power Company
Cook Nuclear Plant
One Cook Place
Bridgman, MI 49106



January 16, 1998

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Operating Licenses DPR-58
Docket No. 50-315

Document Control Manager:

In accordance with the criteria established by 10 CFR 50.73 entitled Licensee Event Report System, the following report is being submitted:

97-027-01

Sincerely,

A handwritten signature in cursive script, reading "J. R. Sampson", is written over the typed name.

J. R. Sampson
Site Vice President

/mbd

Attachment

c: A. B. Beach, Region III
E. E. Fitzpatrick
P. A. Barrett
S. J. Brewer
J. A. Abramson
D. Hahn
Records Center, INPO
NRC Resident Inspector

IE221

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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)
Donald C. Cook Nuclear Plant - Unit 1DOCKET NUMBER (2)
50-315

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TITLE (4)

Westinghouse Integral Fuel Burnable Absorber (IFBA) Fuel Rods

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
10	28	97	97	027	01	1	16	98	Cook Unit 2	50-316
									FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)			
		20.2201(b)	20.2203(a)(3)(i)	50.73(a)(2)(iii)	73.71(b)
POWER LEVEL (10)	0	20.2203(a)(1)	20.2203(a)(3)(ii)	50.73(a)(2)(iv)	73.71(c)
		20.2203(a)(2)(i)	20.2203(a)(4)	50.73(a)(2)(v)	OTHER
		20.2203(a)(2)(ii)	50.36(c)(1)	50.73(a)(2)(vii)	(Specify in Abstract below and in Text, NRC Form 366A)
		20.2203(a)(2)(iii)	50.36(c)(2)	50.73(a)(2)(viii)(A)	
		20.2203(a)(2)(iv)	50.73(a)(2)(i)	50.73(a)(2)(viii)(B)	
		20.2203(a)(2)(v)	X 50.73(a)(2)(ii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME
Mr. Doug Malin, Nuclear Fuels ManagerTELEPHONE NUMBER (Include Area Code)
616/697-5065

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On October 28, 1997, with Unit 1 in Mode 5 and Unit 2 in Mode 6, it was determined that both units had the potential to be outside of their design basis and possibly in non-compliance with 10 CFR 50.46(b)(2). This is a generic issue applicable to Westinghouse fuel rods containing integral fuel burnable absorber (IFBA). It was determined that this was reportable under 10CFR50.72(b)(2)(i) as an event found during shutdown that potentially resulted in a degraded principle safety barrier and an ENS notification was made at 1830 hours on October 28, 1997. An interim LER was submitted on November 24, 1997. This LER is being submitted under 10CFR50.73(a)(2)(ii)(B) as a condition potentially outside of the design basis of the plant.

The licensee was informed by Westinghouse, on October 28, 1997, that in the process of developing new fuel rod cladding corrosion and rod internal pressure models it was determined that these new models showed a decrease in rod internal pressure margin. This decrease in margin has the potential to place plants in a condition that is outside of their design basis with respect to pellet-to-clad gap re-opening. Additionally, should pellet-to-clad gap re-opening occur there is a potential for certain plants to possibly be in non-compliance with the 17 percent oxidation criteria of 10CFR50.46.

Subsequent calculations have shown compliance with 10CFR50.46 for the current operating cycles, Unit 1 Cycle 16 and Unit 2 Cycle 12. Additional calculations show that Unit 1 will be within its design basis with respect to pellet-to-clad gap re-opening throughout Cycle 16 and Unit 2 will be within its design basis for a minimum of 10,680 MWD/MTU (approximately 257 EFPD) for Cycle 12. For the possible operation outside the design basis for Unit 2 Cycle 12 a justification for continued operation has been included in the Reload Safety Evaluation for Unit 2 Cycle 12 which covers operation to the end of the cycle.

LICENSEE EVENT CONTINUATION

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Cook Nuclear Plant - Unit 1	50-315	YEAR	SEQUENTIAL	REVISION	2 OF 3
		97	- 027 -	01	

TEXT (If more space is required, use additional NRC Form 366A's) (17)

Condition Prior to Event

Unit 1 was in Mode Five, Cold Shutdown.

Unit 2 was in Mode Six, Refueling.

Description of Event

Cook Nuclear Plant was notified by Westinghouse that when the effects of increased Zirc-4 corrosion are incorporated into the current licensed version of the Westinghouse fuel performance code, called PAD, gap reopening may be predicted for high duty integral fuel burnable absorber rods as early as the second half of their second duty cycle. One of the fuel design criteria for Westinghouse fuel is that pellet-clad gap reopening will not occur.

Cause of Event

The root cause is currently being investigated by Westinghouse and will be available when the analysis is finalized in mid-1998.

Analysis of Event

On October 28, 1997, with Unit 1 in Mode 5 and Unit 2 in Mode 6, it was determined that both units had the potential to be outside of their design basis and possibly in non-compliance with 10CFR50.46(b)(2). This is a generic issue applicable to Westinghouse fuel rods containing integral fuel burnable absorber (IFBA). It was determined that this was reportable under 10CFR50.72(b)(2)(i) as an event found during shutdown that potentially resulted in a degraded principle safety barrier and an ENS notification was made at 1830 hours on October 28, 1997. An interim LER was submitted on November 24, 1997. This LER is being submitted under 10CFR50.73(a)(2)(ii)(B) as a condition potentially outside of the design basis of the plant.

Subsequent analysis based on the Loss of Coolant Accident (LOCA) analysis that have been performed by Westinghouse has established an initial 12 percent oxidation as a screening criteria to permit assessment of plants regarding compliance with the 17 percent maximum oxidation criteria of 10CFR50.46. Calculations have shown compliance with 10CFR50.46 for the current operating cycles, Unit 1 Cycle 16 and Unit 2 Cycle 12.

Additional calculations show that Unit 1 will be within its design basis with respect to pellet-to-clad gap re-opening throughout Cycle 16. Unit 2 will be within its design basis for a minimum of 10,680 MWD/MTU (approximately 257 EFPD) for Cycle 12. For the possible operation outside the design basis for Unit 2 Cycle 12 a justification for continued operation has been included in the Reload Safety Evaluation for Unit 2 Cycle 12 which covers operations to the end of the cycle.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Corrective Actions

Westinghouse has developed a comprehensive plan to resolve the rod internal pressure issue. This plan of resolution involves three steps: (1) review and improvement of analytical models; (2) gathering of additional data; and (3) performance of plant by plant assessments.

The focus of the Westinghouse plan will be on the fuel performance methodology and models. Westinghouse believes that conservatism exists in the PAD code that will compensate for the increased corrosion feedback effects. These conservatisms include the use of unirradiated cladding creep rates; a pellet to-clad contact model which is restricting the axial growth of the fuel rod, and a strain reversal algorithm which conservatively predicts the point of gap reopening. Westinghouse must still incorporate these effects into the PAD model.

Prior to the introduction of these modeling improvements, a detailed review of the current PAD methods and models will be performed. Following this review the details of the on-going development program plan will be completed by Westinghouse. This program plan will be presented to the NRC and appropriate modifications to the PAD code and methods will be performed with an estimated completion of July 1998. While the analytical activities are underway, collection of additional field data will be pursued to validate fuel performance methods. Current calculations show that Unit 1 will remain within its design basis with respect to pellet-to-clad gap reopening throughout Cycle 16 and Unit 2 for at least 257 EFPD of operation which is beyond the expected completion of the corrective actions. Both units will be in compliance with the 17 percent maximum oxidation criteria of 10CFR50.46 throughout their current operating cycles. Upon completion of the PAD code development, a plant assessment will be performed by Westinghouse with the modified PAD code.

Failed Component Evaluation

Not Applicable.

Previous Similar Events

None.