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FACIL:50-315 Donald C. Cook Nuclear Power Plant, Unit 1, Indiana & 05000315
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SUBJECT: LER 88-003-00:on 880520,procedure inadequacy results in not time response testing low setpoint power range neutron trip. W/8 ltr.

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

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NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
D. C. COOK NUCLEAR PLANT - UNIT 1	0 5 0 0 0 3 1 5	1 OF 0 5

TITLE (4) PROCEDURE INADEQUACY RESULTS IN NOT TIME RESPONSE TESTING LOW SETPOINT POWER RANGE NEUTRON FLUX REACTOR TRIP

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 NAMES	DOCKET NUMBER(S)
0 5	2 0	8 8	8 8	— 0 0 3	— 0 0	0 6	2 0	8 8	D.C.COOK-UNIT 2	0 5 0 0 0 3 1 6
										0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 9 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	X 50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
T. P. BEILMAN INSTRUMENTATION AND CONTROL DEPARTMENT SUPERINTENDENT	AREA CODE 6 1 6 — 4 6 5 — 5 9 0 1

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)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X YES (If yes, complete EXPECTED SUBMISSION DATE)	NO		0 4	3 0	8 9

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

As a result of our commitment in LER 50-315/87-014, an extensive re-review of reactor trip system instrumentation time response testing procedures versus the Technical Specification (and other source documents) requirements was undertaken. It was observed that the time response test procedure for the Nuclear Instrumentation System (NIS) Power Range Neutron Flux (PRNF) reactor trip only included the High Setpoint trip. The Technical Specification specifies a response time for the PRNF reactor trip, but does not specify the High Setpoint and Low Setpoint as separate functional units.

On May 20, 1988, it was determined that the Low Setpoint trip was taken credit for in the safety analysis for both Units 1 and 2 and should therefore have been time response tested.

The reason for the omission could not be determined but the lack of specific detail in the technical specification is presumed to have contributed to the omission.

The time response test procedures are being revised to include PRNF Low Setpoint time response testing. An updated LER will be submitted when the review program has been completed (expected completion date March, 1989).

IE22
1/1

NRC Form

Conditions Prior To Occurrence

Unit One in Mode 1 at 90 percent reactor thermal power.
Unit Two in Mode 6 (Refueling).

Description of Event

As a result of our commitment in LER 50-315/87-014, an extensive re-review of reactor trip system instrumentation time response testing procedures versus the Technical Specification (and other source documents) requirements was undertaken. It was observed that the time response test procedure for the Nuclear Instrumentation System (NIS) Power Range Neutron Flux (PRNF) reactor trip (EIIS-JC/JS) only included the High Setpoint trip. The power range channels provide two high neutron flux reactor trips; the Low Setpoint Trip at 25 percent of rated thermal power and the High Setpoint Trip at 109 percent of rated thermal power. The Low Setpoint trip may be manually blocked after reactor power has increased above 10 percent power. The Technical Specification specifies a response time for the PRNF reactor trip, but does not specify the High Setpoint and Low Setpoint as separate functional units.

On May 20, 1988, it was determined that the Low Setpoint trip was taken credit for in the safety analysis for both Units 1 and 2 and should therefore have been time response tested.

Cause of the Event

The PRNF Low Setpoint Reactor Trip circuit has never been included in the time response test procedures were written. The reason for this omission could not be determined due to the length of time involved (approximately 13 years.) It is believed that the lack of specific detail in the Technical Specifications, regarding the separate setpoints of the PRNF reactor trips, was a contributing factor. It is possible that our assumption/interpretation at the time concluded that periodic testing of the PRNF Low Setpoint trip was not required.

Analysis of Event

This event is being reported per 10CFR 50.73 (a)(2)(v) as the plant was being operated outside the requirements of Technical Specification due to procedure inadequacy.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

The PRNF Low Setpoint circuits have always been functionally tested, but have not been response time tested to demonstrate that they function within the time allotted by the safety analysis. This trip function is assumed in the rod withdrawal from subcritical transient for both Units and is also taken credit for in the rod ejection transient for Unit 1.

Justification for continued operation was based on the following:

1. This trip is not required above P-10 (approximately 10 percent reactor thermal power). Unit One is currently operating above 10 percent reactor thermal power.

2. This trip is not required with the reactor shutdown and reactor trip breakers open. Unit Two is in Mode 6 (refueling) and is not scheduled to start up until December, 1988.

Unit 1 reactor will continue to be operated above P-10. If the reactor is brought below P-10, the time response tests will be completed prior to making the control rod system (EIIS-JC/JC) capable of rod withdrawal per the Technical Specifications requirements.

The failure to perform the PRNF Low Setpoint trip time response test was determined to have no significant safety consequences based on the following considerations:

1. The PRNF Low Setpoint trip is a 2 out of 4 trip. While the trip has not specifically been time response tested, we expect for the reasons given in Item 2 (below) that at least two of the channels would have tripped in a timely manner.

2. There are only three components in the PRNF Low Setpoint circuit which differ from the PRNF High Setpoint circuit (which is time response tested). These components are the PRNF Low Setpoint bistable (EIIS-JC/JS), the Solid Sate Protection System (SSPS) input relay (EIIS-JC/RLY), and the SSPS logic card (EIIS-JC/JC). While these components are physically separate from the corresponding PRNF High Setpoint components, they are identical in design and are in fact interchangeable; only the setpoints need be adjusted. The PRNF High Setpoint trip has been time response tested on both units every cycle since before Cycle 1 and has always demonstrated acceptable As Found results. There is no reason to expect otherwise from the PRNF Low Setpoint trip circuitry.

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

3. There is redundant and diverse instrumentation available to provide additional protection for the transients in question (uncontrolled rod withdrawal from subcritical and rod ejection). During the time from the control rods being capable of withdrawal to 10 percent power operation, this instrumentation includes:

   a) Source Range instrumentation (EIIS-JC/JS) which has 1 out of 2 trip logic, with a setpoint of 10^5 counts per second.

   b) Intermediate Range instrumentation (EIIS-JC/JS) which also has a 1 out of 2 trip logic with a setpoint equivalent to the PRNF Low Setpoint trip setpoint (25 percent).

   c) Positive Rate Neutron Flux (EIIS-JC/JS) protection from the Power Range instrumentation is available, with a 2 out of 4 trip logic. The positive rate setpoint is 5 percent with a 2 second time constant. The Unit 1 limiting cases of rod withdrawal and rod ejection yield power ramp rates of approximately 10^3 to 10^4 percent per second, well in excess of the positive rate setpoint.

   None of the above backup instrumentation is required to be time response tested and therefore has not been tested. However, we do not expect that all of this instrumentation which is safety grade would fail to function in a timely manner. In addition, the positive rate trip is very similar to the negative rate trip which is time response tested. The positive rate trip utilizes a different bistable, SSPS input relay, and SSPS logic card; these differences are similar to the High Setpoint/Low Setpoint differences discussed in Item 2.

4. Finally, it must be observed that the transients were analyzed for Unit 1 with two reactor coolant pumps (RCP's) (EIIS-AB/P) operating and for Unit 2 with three RCP's operating. Operating procedures require 4 RCP's in operation whenever the units are in Modes 1 or 2, and whenever temperature is 541 degrees Fahrenheit of greater. These procedures ensure compliance with Technical Specifications which require four RCP's in Modes 1 and 2, and preclude criticality below 541 degrees Fahrenheit. These operating procedures result in four RCP's in operation in almost every case in which the rods are capable of being withdrawn. This increased flow would significantly mitigate the consequences of a rod withdrawal transient.

In summary, it is highly unlikely that all of this diverse and redundant instrumentation would have failed to trip the reactor (EIIS-AB/P) in a timely manner. We also conclude that the required practice of running four RCP's during startup operations would significantly reduce the consequences of the two transients of concern. Therefore, we conclude that failure to time response test the PRNF Low Setpoint trip did not result in a significant hazard to the health and safety of the public.

Corrective Action

All applicable sections of Technical Specifications were reviewed to identify if this lack of specific detail could have caused a similar testing omission on this circuitry. None were identified. The issue will be integrated into our Technical Specification upgrade program for a proposed amendment clarifying the Technical Specifications.

The time response test procedures are being revised to include PRNF Low Setpoint time response testing. The circuits are not being tested immediately due to the non-applicability of this Technical Specification requirement to the current mode of either unit. Administrative controls have been established to prevent operation of either unit in a mode in which the PRNF Low Setpoint is required to be operable, until testing has been completed and the results are satisfactory.

We have essentially completed the review to assure that the existing procedures meet the current Technical Specification requirements. We are also performing a review to assure that the Technical Specification time response requirements clearly represent the assumptions and requirements of the safety analysis. This effort will not be completed until March, 1989 due to the extensive re-analysis work being performed under the D. C. Cook Plant T_{HOT} Reduction/Rerating program. An updated LER will be submitted following the completion of this review.

Failed Component Identification

There were no component failures related to this event.

Previous Similar Events

LER 50-315/87-014-0
LER 50-315/86-006-0
LER 50-315/86-007-0
LER 50-315/86-013-0

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INDIANA MICHIGAN POWER

June 20, 1988

United States Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Operating License DPR-58
Docket No. 50-315

Document Control Manager:

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

88-003-00

Sincerely,

W. G. Smith, Jr.
Plant Manager

WGS:clw

Attachment

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