

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) D. C. Cook Nuclear Plant, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 1 1 5 1	PAGE (3) 1 OF 0 6
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TITLE (4) Reactor Trip System Interlock Setpoints Not in Literal Compliance with Technical Specifications Due to Misinterpretation of Requirements

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 2	1 7	8 6	8 6	0 0 2	0 1 0	0 6	1 5	8 6	D. C. Cook - Unit 2		0 5 0 0 0 3 1 1 6
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THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)

OPERATING MODE (9) 1	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
	20.405(a)(1)(i)	50.36(c)(1)	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)	X 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)(ix)		

LICENSEE CONTACT FOR THIS LER (12)

NAME L. S. Gibson - Technical Engineering Superintendent	TELEPHONE NUMBER 6 1 6 4 6 5 - 5 9 0 1 1
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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) NO

EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

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

On February 17, 1986, at 1515 hours, a review of the Technical Specifications (T/S) found that three Reactor Trip System Interlock Setpoints may not have been set in accordance with T/S requirements. The affected setpoints were associated with the P-6, P-7 (through P-13) and P-10 interlocks. The cause of the event appears to have been a misinterpretation of T/S requirements when they were originally incorporated into plant procedures. This situation affected both Units 1 and 2 and, based upon our evaluation, did not have any safety significance.

To prevent recurrence, appropriate procedures for both units have been revised to agree with T/S's. All permissive setpoints will be reset to the new procedural requirements before changing to a mode in which the interlock is required to be operable. In the long term, the T/S's in this area will be clarified as part of the D. C. Cook T/S improvement program, currently on-going with the Office of Nuclear Reactor Regulation.

This is a supplemental report to provide an analysis of the event and corrective action.

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

Conditions Prior to Occurrence

Unit 1 - Mode 1 (Power Operation) - 90 percent reactor thermal power

Unit 2 - Mode 1 (Power Operation) - 80 percent reactor thermal power

Description of Event

As part of our efforts to improve regulatory compliance, we have been conducting a review of our Technical Specification (T/S) requirements to assure literal compliance and that the T/S's accurately reflect the design basis. This review is currently focused in the Instrumentation & Control Area.

As a result of this activity, it was discovered that three Reactor Trip System (EIIIS/JO) Interlocks were set in noncompliance with literal T/S requirements. The initial discovery concerned the P-7 and P-10 interlock setpoints and occurred at 1515 hours on February 17, 1986. Follow-up investigations indicated that a similar situation also existed with the P-6 interlock setpoint.

The problem with the P-10 setpoint was that the reset value, when reducing power, was below that required by the T/S's. The problem with P-7 was that one of the inputs, that from the P-13 setpoint, was set at a slightly higher pressure than specified. P-6 was also set at a lower value than required. Details of the actual setpoint are discussed under Analysis of Event.

Upon discovery, since both units were operating at power, an evaluation was made as to whether power operation could continue. That evaluation indicated that since the reactor was operating well above the power range where the interlocks were required, power operation could continue. The situation was discussed with the NRC.

Cause of Event

The original cause of the event was apparent failure to interpret the T/S requirements correctly. This led to inappropriate procedures implementing the T/S requirements. Procedural adherence is not an issue, since plant personnel established the setpoints in accordance with the approved procedural requirements.

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Analysis of Event

Permissive bistable setpoints or reset points had been set by procedure to values non-conservative to T/S requirements in both units. This condition resulted in operation outside of the these requirements for small power intervals during startup and shutdown as follows:

Reactor Trip System (RTS) Interlock P-6:

RTS interlock P-6 permits manual blocking of the source range reactor trip on a power increase above a set power level. On a decrease in reactor power the T/S's require that the manual block of the Source Range trip is automatically defeated at an Intermediate Range Neutron Flux level of < 6 E-11 amps. This neutron flux level was misinterpreted as a setpoint value and the P-6 reset setpoint was set, by procedure, at a value between 4.5E-11 to 5E-11 amps. This resulted in operation below 6E-11 amps with the source range trip remaining blocked during a power decrease contrary to T/S requirements.

RTS Interlock P-10:

RTS Interlock P-10 permits manual blocking of the Power Range low setpoint reactor trip, Intermediate Range reactor trip and Intermediate Range rod stops on a power increase above a set power level. On a decrease in reactor power the T/S require that the manual blocks are automatically defeated at a power range neutron flux level of < 9 percent of rated thermal power (RTP). This neutron flux level was similarly misinterpreted and the P-10 reset setpoint value was set by procedure at 8 percent ± 0.5 percent of rated thermal power. During a power decrease, this resulted in operation below 9 percent RTP with the power range low setpoint reactor trip, intermediate range reactor trip, and rod stop remaining blocked contrary to the T/S requirements.

RTS Interlock P-7:

RTS Interlock P-7 prevents or defeats the automatic block of reactor trip on low reactor coolant flow, reactor coolant pump under-voltage and under-frequency, turbine trip, pressurizer low-pressure and pressurizer high water level.

On a power increase P-7 is developed when either RTS interlocks P-10 or P-13 (turbine first stage pressure) reach their setpoint values. The T/S's require that P-7 is functioning to defeat the automatic blocks of the above P-7 related trips prior to reactor thermal power reaching 11 percent RTP or turbine first stage pressure reaching 37 psig in Unit 1, or 66 psia in Unit 2. The applicable calibration procedures correctly established the setpoint for P-10 at < 11 percent RTP. The P-13 setpoint value was misinterpreted and was specified by the procedure to be set at between 50.7 to 51.3 psig, and 87.0 to 87.9 psia for Units 1 and 2, respectively, which is non-conservative with respect to the T/S requirements. As a result, should turbine power (P-13) have reached the required T/S setpoint value prior to reactor power

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(P-10) reaching its setpoint value, then RTS interlock P-7 would not have functioned to defeat the automatic block of reactor trip when required.

On decreasing power, P-7 functions to automatically block the above reactor trips. For P-7 to be reset, both P-10 and P-13 must reach their reset setpoint.

The P-13 input to the P-7 interlock would have reset at a non-conservative value because the actual setpoint was set higher than the T/S value (37 psig for Unit 1 and 66 psia for Unit 2).

The P-10 input to the P-7 interlock as described above was set to reset at 8 percent \pm 0.5 percent RTP which is conservative with respect to the T/S requirement for the defeating of the reactor trips.

Therefore, since both P-10 and P-13 must reach their reset value, the reset value for P-7 was conservative. (See the attachment for a pictorial description.)

The P-6 permissive being set lower than the T/S value could have resulted in the source range instrumentation being prematurely blocked. When this occurred, however, the intermediate range and power range instrumentation would still have been available. There are two accidents for which the source range trip has been considered as a means of reactor protection: boron dilution during startup, and an uncontrolled rod withdrawal from subcritical. The source range trip would have been available during a subcritical condition, and protection for these accidents provided. Furthermore, no credit for the source range trip and the intermediate range trip was taken for the rod withdrawal accident from subcritical.

The P-10 permissive resetting at a lower value than the T/S value would have resulted in a slight delay in defeating the block of the power range (low setpoint) reactor trip, the block of the intermediate range reactor trip, and the block of the intermediate range rod stops. These protective features are designed to protect against adverse consequences caused by an increase in reactivity such as a rod withdrawal from subcritical conditions. Thus, even with a setpoint slightly lower than the T/S values, these features would still have been activated to protect against this accident.

During the short period of time in which the T/S values may have been exceeded, a reactor trip would have been provided by the power range trip and the overtemperature trip, the same features used to provide protection against a rod withdrawal at power. Based on available data and the conservatism in the analysis, we believe the lower setpoint of 7.5 percent would have reduced the DNBR by less than 1 percent. Had analysis been performed at this lower initial condition, we believe the results would have been acceptable.

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Based on the foregoing, it is concluded that there were no adverse safety conditions as a result of these interlock setpoints. The health and safety of the public were not affected.

Corrective Action

Setpoint calibration procedures for both units have been revised. All permissives will be reset to these new procedural requirements before changing to a mode in which the interlock is required to be operable.

In addition to the above, we are taking action to clarify the T/S's in both this and similar areas. The Donald C. Cook Nuclear Plant was licensed under the original version of Standardized Technical Specifications. We have had recent discussions with the NRC where it was agreed that the plant T/S's need general upgrading to deal with difficulties associated with literal interpretation requirements. We believe this T/S upgrade program is the appropriate corrective action to avoid similar issues in the future.

Failed Component Identification

Not applicable.

Previous Similar Events

No previous similar events have occurred.

Similar T/S interpretation/application difficulties have been reported in LER 85-043.

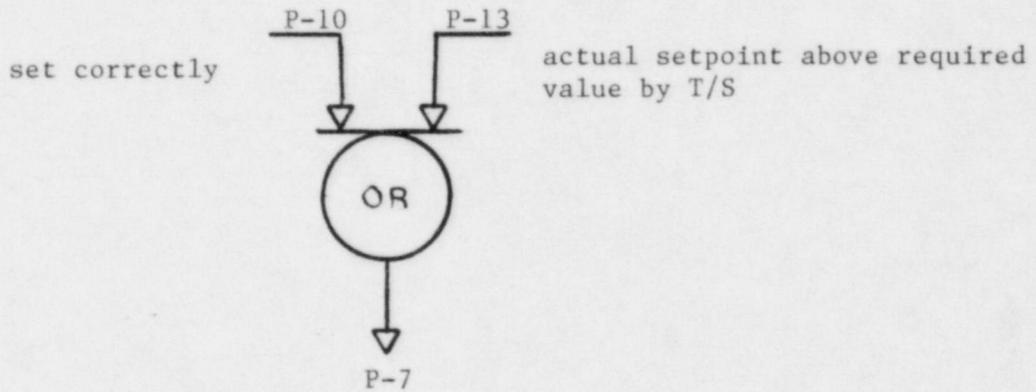
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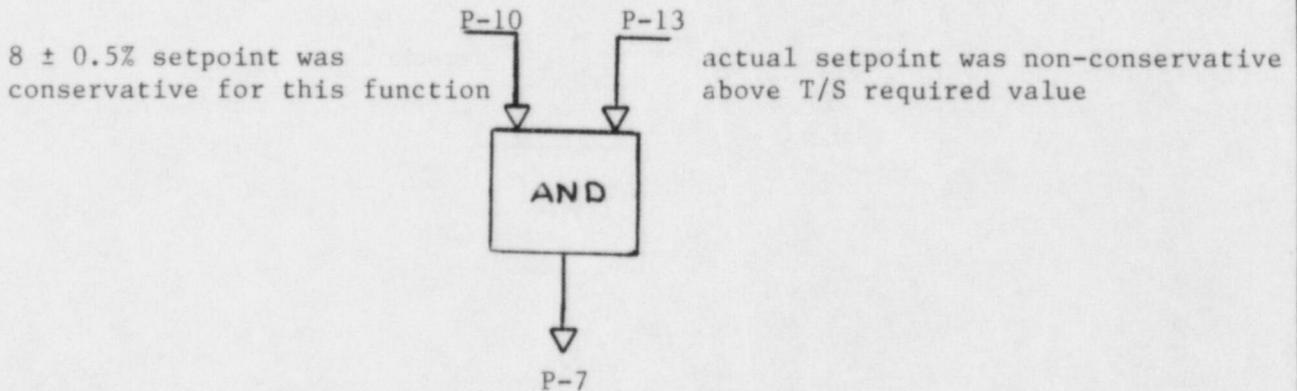
REACTOR TRIP INTERLOCK P-7 LOGIC

A. POWER INCREASE



If turbine power would have reached T/S required value before Reactor Power, P-7 would not have defeated the automatic reactor trip blocks.

B. POWER DECREASE



Since both P-10 and P-13 inputs are required, P-7 would have blocked Reactor Trips at a value below allowable. That is, the automatic trips would have remained in place at a lower power level than required.



INDIANA & MICHIGAN ELECTRIC COMPANY

Donald C. Cook Nuclear Plant
P.O. Box 458, Bridgman, Michigan 49106

June 16, 1986

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

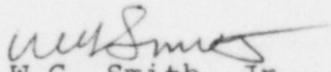
Operating License DPR-58
Docket No. 50-315

Document Control Manager:

In accordance with the criteria established by 10CFR50.73
entitled Licensee Event Reporting System, the following
report/s are being submitted:

86-002-01

Sincerely,


W.G. Smith, Jr.
Plant Manager

/cbm

Attachment

cc: John E. Dolan
J.G. Keppler, RO:III
M.P. Alexich
R.F. Kroeger
H.G. Brugger
R.W. Jurgensen
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