



July 31, 2000

United States Nuclear Regulatory Commission  
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Washington, DC 20555

Operating License DPR-74  
Docket No. 50-316

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:

LER 316/2000-008-00, "Erroneous Plant Process Computer Input Data Resulted in Power Range Trip Setpoints Above TS Limit."

The following commitments were identified in this submittal:

- The appropriate Unit 1 and 2 plant procedures will be revised to include specific acceptance criteria regarding error tolerances for those plant parameters used in calculating the calorimetric power level. This action will be completed prior to Unit 1 restart, Mode 2.
- As an interim preventive action, reactor engineering will perform a calorimetric calculation at 50 percent power during any restart following a Unit 2 plant trip. This interim action will remain in effect until the acceptance criteria procedure revisions identified above have occurred.
- An expanded extent of condition evaluation will be performed to determine whether engineering procedures have appropriate acceptance criteria for the functions they test. Corrective actions from the evaluation will be addressed through the D.C. Cook corrective action program.
- An investigation will be performed regarding multiple unrecognized entries into Technical Specification 3.0.3 from this and other recent events. Corrective actions from the investigation will be addressed through the D.C. Cook corrective action program.

Should you have any questions regarding this correspondence, please contact Mr. Brian A. McIntyre, Acting Director, Regulatory Affairs, at 616/697-5806.

Sincerely,

A handwritten signature in black ink, appearing to read 'A. Bakken III', enclosed within a large, loopy circular flourish.

A. Christopher Bakken, III  
Site Vice President

/bwo  
Attachment

IE22

c: J. E. Dyer, Region III  
B. A. McIntyre  
D. Hahn  
W. J. Kropp  
R. P. Powers  
R. Whale  
NRC Resident Inspector  
Records Center, INPO

NRC Form 366 (6-1998)				U.S. NUCLEAR REGULATORY COMMISSION				APPROVED BY OMB NO. 3150-0104    EXPIRES 06/30/2001  <small>ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), 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</small>			
<b>LICENSEE EVENT REPORT (LER)</b>  (See reverse for required number of digits/characters for each block)											
FACILITY NAME (1)  Donald C. Cook Nuclear Plant Unit 2						DOCKET NUMBER (2)  05000-316		PAGE (3)  1 of 3			
TITLE (4)  Erroneous Plant Process Computer Input Data Resulted in Power Range Trip Setpoints Above TS Limit											
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	
06	30	2000	2000	-- 008 --	00	07	31	2000	FACILITY NAME	DOCKET NUMBER	
OPERATING MODE (9)		1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)								
POWER LEVEL (10)		92	20.2201 (b)		20.2203(a)(2)(v)		<input checked="" type="checkbox"/> 50.73(a)(2)(i)		50.73(a)(2)(viii)		
			20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)		
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71		
			20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER		
			20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A		
20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)							
LICENSEE CONTACT FOR THIS LER (12)											
NAME  M. B. Depuydt, Regulatory Compliance								TELEPHONE NUMBER (Include Area Code)  (616) 465-5901, x1589			
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)											
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX							
SUPPLEMENTAL REPORT EXPECTED (14)					EXPECTED SUBMISSION DATE (15)			MONTH	DAY	YEAR	
YES (If Yes, complete EXPECTED SUBMISSION DATE).				<input checked="" type="checkbox"/> NO							
<b>Abstract (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)</b> On June 30, 2000, during performance of procedure 12 EHP 4030 STP.219, "Thermal Power Measurement and Reactor Coolant System Flow Rate," it was identified that the Neutron Flux High trip setpoints for the Power Range Nuclear Instrumentation (PRNI) were above the Technical Specification (TS) 2.2.1 (reactor trip system setpoints) allowable value of 110 percent of Rated Thermal Power (RTP). Higher than expected feedwater temperatures due to intermittent circuit card contacts resulted in an indicated power level lower than actual power. PRNI 109 percent trip setpoints were adjusted based on the lower than actual indicated power level. A subsequent calorimetric calculation required an adjustment of indicated power upward by two percent, resulting in the PRNI trip settings exceeding the TS limit of 110 percent. With all four PRNIs inoperable, the requirements of TS 3.3.1.1 (reactor trip system instrumentation) were not met and an unrecognized entry into TS 3.0.3 occurred. This LER is submitted in accordance with 10CFR50.73(a)(2)(i)(B) as a condition prohibited by TS. The cause for the PRNI Neutron Flux High trip setpoints being set above the TS limit was due to an inadequate TS surveillance procedure. The loose PPC FW temperature reference card contacts were tightened, and PRNI settings reset to 109 percent. Unit 1 and 2 plant procedures will be revised to include specific acceptance criteria regarding error tolerances for calorimetric plant parameters. As an interim preventive action, reactor engineering will perform a calorimetric calculation at 50 percent power during any restart following a Unit 2 plant trip. An expanded extent of condition evaluation will be performed to determine whether engineering EHP procedures have appropriate acceptance criteria for the functions they test. An investigation will be performed regarding multiple unrecognized entries into TS 3.0.3 from this and recent other events. Plant accident analyses bound the condition identified in this LER; therefore, there was minimal safety significance.											

**LICENSEE EVENT REPORT (LER)**  
**TEXT CONTINUATION**

FACILITY NAME (1)	DOCKET NUMBER(2)	LER NUMBER (6)					PAGE (3)
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		2000	--	008	--	00	

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

**Conditions Prior to Event**

Unit 2, Mode 1, Power Operation, at approximately 92 percent Rated Thermal Power

**Description of Event**

On June 30, 2000, during performance of procedure 12 EHP 4030 STP.219, "Thermal Power Measurement and Reactor Coolant System Flow Rate," it was identified that the Neutron Flux High trip setpoints for the Power Range Nuclear Instrumentation (PRNI) were above the Technical Specification (TS) 2.2.1 allowable value of 110 percent of Rated Thermal Power (RTP).

Investigation identified that, during the June 25, 2000, performance of procedure 12 EHP 4030 STP.219 calorimetric calculation, the Plant Process Computer (PPC) feedwater temperature indications were found to be reading higher than the test instrumentation at the 30 percent power procedure hold point. The four PPC feedwater temperature indicators were indicating approximately 328 degrees Fahrenheit (F), while the test instrumentation was indicating approximately 311 degrees F. As a result of the high input feedwater temperatures to the PPC, the PPC indicated power level was reading lower than the calorimetric actual power level. Comparison of the calculated calorimetric power level versus the PPC indicated power level identified that the indicated PPC power level was 25.7 percent, which was below the calculated calorimetric value of 26.2 percent as determined by procedure 12 EHP 4030 STP.219. Because procedure 12 EHP 4030 STP.219 does not provide specific acceptance criteria regarding error tolerances for those parameters used in performing the calorimetric, test personnel considered the 0.5 percent error to be acceptable, based on past experience. At 50 percent power, the four PRNI Neutron High trip setpoints were raised to 109 percent per procedure 2 EHP 6040 PER.359, "Zero Power and Power Ascension Tests for Post-Refueling Startups," without performing another calorimetric. In accordance with procedure 12 OHP 6040 PER.359, a calorimetric is not required at 50 percent power if the difference between the two power level indications at the 30 percent procedure hold point is acceptable.

Power ascension continued until the 88 percent power procedure hold point was reached on June 30, 2000. At 88 percent power, a calorimetric calculation was performed in accordance with procedure 12 EHP 4030 STP.219 to determine actual power level. The four feedwater temperature indicators continued to indicate higher than the test instrumentation. Comparison of the indicated PPC power level and the calorimetric power level identified that the difference between the two power level indications had increased from 0.5 percent to greater than 2 percent. Adjustment of indicated power was made to match the actual calorimetric power level. This 2 percent adjustment resulted in as-found PRNI Neutron Flux High trip setpoints being set between 110.24 and 111.04 percent. Because all four PRNI trip setpoints were above the TS 2.2.1 allowable value of less than or equal to 110 percent, the PRNIs were inoperable. With less than the minimum number of channels required to be operable in Modes 1-2, the condition represents a failure to meet the requirements of TS 3.3.1.1 (reactor trip system instrumentation) and an unrecognized entry into TS 3.0.3 occurred.

This LER is submitted in accordance with 10CFR50.73(a)(2)(i)(B) as a condition prohibited by TS, since the PRNI Neutron Flux High trip setpoints exceeded the allowable TS limit.

**Cause of Event**

The cause for the PRNI Neutron Flux High trip setpoints being set above the TS limit was due to an inadequate TS surveillance procedure. The investigation identified that the erroneously high feedwater temperature indications were the result of the PPC feedwater temperature reference junction input card connections making intermittent contact. This intermittent connection resulted in the PRNI Neutron Flux High setpoints being adjusted to 109 percent based on a lower than actual power level. However, the erroneous indications were not identified because procedure 12 EHP 4030 STP.219 does not provide specific acceptance criteria regarding allowable delta tolerances between the PPC indicated power and the calculated RTP. As a result, test personnel chose to rely on past experience to conclude that the 0.5 percent difference was acceptable.

**LICENSEE EVENT REPORT (LER)**  
**TEXT CONTINUATION**

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

**Analysis of Event**

The Updated Final Safety Analysis Report (UFSAR) Section 7.4, states that the primary function of nuclear instrumentation is to safeguard the reactor by monitoring the neutron flux and generating appropriate trips and alarms for various phases of reactor operating and shutdown conditions. It also provides a secondary control function and indicates reactor status during startup and power operation. The Nuclear Instrumentation System uses information from three separate types of instrumentation channels to provide three discrete protection levels. Each range of instrumentation (source, intermediate, and power) provides the necessary overpower reactor trip protection required during operation in each of the three ranges of reactor power.

For those UFSAR Chapter 14 accident analyses which rely on the PRNI Neutron Flux High reactor trip function, such as a Rod Ejection or an Uncontrolled Rod Bank Withdrawal at power, the input assumptions for the PRNI Neutron Flux High trip setpoint and initiating power level are 118 percent and 105 percent, respectively. Based on these assumptions, had one of the above accidents occurred at 92 percent RTP (the indicated reactor power level at the time this condition was identified) while the PRNI Neutron Flux High trip setpoints were above 110 percent, the initiating power level (92 percent RTP) would have been well below the accident analysis input assumption of 105 percent.

With 2-out-of-4 Reactor Protection System (RPS) instrumentation channels required to trip the reactor, a reactor trip would have been initiated by 2 of the 3 PRNIs whose Neutron Flux High trip setpoints were found set at 110.24 percent RTP. Considering a PRNI instrument uncertainty of plus or minus 7.08 percent, the worst case for initiation of a reactor trip signal would occur at 117.32 percent RTP, which is below the 118 percent trip initiation assumed in the accident analyses for the above events. Therefore, the UFSAR accident analyses bound the condition identified in this LER.

In the event an accident had occurred with the PRNIs set between 110.24 and 111.04 percent RTP, the RPS would have been able to perform its safety function and trip the reactor. Therefore, this condition had minimal safety significance.

**Corrective Actions**

On June 30, 2000, the loose PPC FW temperature reference card contacts were tightened and tested with satisfactory results. In addition, the PRNI Neutron Flux High trip setpoints were reset to 109 percent in accordance with the TS limit.

The appropriate Unit 1 and 2 plant procedures will be revised to include specific acceptance criteria regarding error tolerances for those plant parameters used in calculating the calorimetric RTP level. This action will be completed prior to Unit 1 restart, Mode 2.

As an interim preventive action, reactor engineering will perform a calorimetric calculation at 50 percent power during any restart following a Unit 2 plant trip. The calculation will be performed in accordance with the appropriate plant procedures to ensure the difference between the calculated calorimetric and the Plant Process Computer indicated power levels are within acceptable delta tolerances. This interim action will remain in effect until the acceptance criteria procedure revisions identified above have occurred.

An expanded extent of condition evaluation will be performed to determine whether engineering EHP procedures have appropriate acceptance criteria for the functions they test. Corrective actions from the evaluation will be addressed through the D.C. Cook corrective action program.

An investigation will be performed regarding multiple unrecognized entries into TS 3.0.3 from this and other recent events. Corrective actions from the investigation will be addressed through the D.C. Cook corrective action program.

**Previous Similar Events**

None