

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 RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U7.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Susquehanna Steam Electric Station - Unit 2										DOCKET NUMBER(2) 0 5 0 0 0 3 8 8				PAGE (3) 1 OF 0 5	
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TITLE (4)
Shift Average Licensed Core Thermal Power Was Exceeded

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 6	0 9	9 5	9 5	0 0 8	0 0	0 7	0 7	9 5			0 5 0 0 0 0		
												0 5 0 0 0 0	

OPERATING MODE (9) 1		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5 : (Check one or more of the following) (11)									
POWER LEVEL (10) 1 0 0	20.402(b)			20.405(c)			50.73(a)(2)(v)			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)(vi)			X	
	20.405(a)(1)(iii)			50.73(a)(2)(i)			50.73(a)(2)(vi)(A)			OTHER (Specify in Abstract below and in Text, NRC Form 366A)	
	20.405(a)(1)(iv)			50.73(a)(2)(ii)			50.73(1)(2)(vi)(B)				
	20.405(a)(1)(v)			50.73(a)(2)(iii)			50.73(a)(2)(v)				

(LICENSEE CONTACT FOR THIS LER (12))

NAME Richard R. Wehry - Project Engineer, Nuclear Licensing							TELEPHONE NUMBER			
							AREA CODE			
							7 1 7 5 4 2 - 3 6 6 4			

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
X	A A	F T E	3 6 9	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (if yes, complete EXPECTED SUBMISSION DATE)	X NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

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

On June 9, 1995 and June 10, 1995, with Unit 2 in Condition 1 (Power Operation) at 100% and 99.9% power, respectively, instrumentation problems were discovered which affected the unit's heat balance calculation in a non-conservative direction and which were determined to have resulted in exceeding the licensed core thermal power (CTP) shift average by up to 4 MWt (0.0116%) during the current Unit 2 Cycle 7 operation. The discovered conditions were attributed to the following causes: instrumentation drift / failure; lack of clear identification for instruments that provide heat balance calculation inputs, both physically in the plant / control room and on design drawings; inadequately addressing the effects of instruments that influence the heat balance in work control documents; inadequate training on the failure or removal from service of instruments and their influence on the heat balance calculation; and failure to trend heat balance input parameters. No licensing safety limits were approached during the operating cycle. There were no safety consequences or compromises to public health or safety. Corrective actions include: repair / calibration of subject instrumentation; labeling of heat balance related instruments; identifying heat balance related instruments on applicable drawings; inclusion of heat balance information in work control documents; training of personnel; and development of a heat balance input related instrumentation trending program.

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TEXT CONTINUATION**

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

DESCRIPTION OF EVENT

On June 9, 1995 and June 10, 1995, with Unit 2 in Condition 1 (Power Operation) at 100% and 99.9% power, respectively, instrumentation problems were discovered which affected the unit's heat balance calculation in a non-conservative direction and which were determined to have resulted in exceeding the licensed core thermal power (CTP) shift average by up to 4 MWt during the current Unit 2 operating cycle. The maximum error during the cycle corresponded to 0.0116% of the licensed core thermal power limit of 3441 MWt. The unit was derated accordingly, pending correction of all instrument problems.

Details of Event

On June 9, 1995, a review of instrumentation having influence on the unit's heat balance calculation was being implemented as a result of a Control Rod Drive (CRD; EIIS Code: AA) system flow transmitter which had failed on April 24, 1995 and which had been replaced on May 2, 1995. During the review, it was discovered that the 2A Reactor Recirculation Pump (EIIS Code: AD) power indication was higher than the expected value. This affected the unit's heat balance calculation in the non-conservative direction, which corresponded to approximately 1 MWt in excess of the licensed core thermal power (CTP) of 3441 MWt. The unit was derated 1 MWt accordingly.

On June 10, 1995, the continuing review also identified that the Reactor Water Cleanup (RWCU; EIIS Code: CE) inlet temperature was indicating low (472 degrees F vice the expected 524 degrees F). This also affected the unit's heat balance calculation in the non-conservative direction, which corresponded to approximately 2 MWt in excess of the licensed CTP of 3441 MWt. The unit was derated an additional 3 MWt.

Unit 2 CTP had already been reduced by 1 MWt on February 10, 1995 due to Feedwater (EIIS Code: JB) flow instrument calibration inaccuracies (drawing error that had existed since initial construction), as reported in Licensee Event Report 50-388 / 95-003-00.

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

Based on the investigation and extending the evaluation over all of Unit 2 Cycle 7 operation lead to the conclusion that the shift average CTP exceeded the 3441 MWt limit by up to 2 MWt before RWCU inlet temperature indication started to degrade in late October 1994, by up to 4 MWt during the October 1994 to February 1995 timeframe, and by up to 3 MWt between February and June 1995. The maximum amount that the shift average CTP was exceeded by (4 MWt) corresponded to 0.0116% of 3441 MWt.

CAUSE OF EVENT

The discovered conditions were attributed to the following causes:

- Instrumentation drift / failure
- Lack of clear identification for instruments that provide heat balance inputs, both physically in the plant and control room, as well as on drawings
- Lack of appropriately addressing the effects of instruments that influence the heat balance calculation in work control documents
- Inadequate training on the failure or removal from service of instruments that influence the heat balance calculation
- Failure to trend heat balance input parameters.

REPORTABILITY / ANALYSIS

The discovered conditions were determined to be reportable pursuant to NRC Document SSINS #0200, "Discussion of Licensed Power Level" (AITS.F1458OHZ), dated August 22, 1980. This document states that the shift average power level should not exceed the full steady state licensed power. An in-depth evaluation concluded that the shift average CTP exceeded the 3441 MWt limit by up to 2 MWt before RWCU inlet temperature indication started to degrade in late October 1994, by up to 4 MWt during the October 1994 to February 1995 timeframe, and by up to 3 MWt between February and June 1995.

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There were no safety consequences from this series of events because the small magnitude of the combined effects of the events did not approach the licensing basis initial condition value of 102% rated CTP. This is because the 4 MWt (0.0116% CTP) combined error is only a small fraction of the 2% CTP conservative margin used in the licensing basis analysis initial conditions. No licensing basis events occurred during this period which would have challenged any of the licensing limits (LHGR, MAPLHGR, MCPR).

The events combined to add up to a 4 MWt error which was conservatively implemented as a 5 MWt administrative core thermal power derate until the situation was fully evaluated. The CRD system flow and RWCU inlet temperature problems have already been corrected, but the feedwater flow and recirc pump power instrument problems require equipment outages in order to correct the conditions. The plant operational impact has been manifested in a series of administrative CTP derates, with a remaining 2 MWt derate (1 MWt each for feedwater flow and recirc pump power).

In accordance with guidance provided in NUREG 1022, Supplement 1, Item 14.1 and 10CFR50.4(D), the required submission date for this report was determined to be July 10, 1995.

CORRECTIVE ACTIONS

Administrative CTP derates were applied for each of the identified instrument problems. A 2 MWt derate remains (1 MWt each for feedwater flow and recirc pump power) in effect until corrective actions are completed (requires equipment outages).

Corrective actions include:

- Repair / recalibration of subject instrumentation
- Identification labeling of all heat balance related instruments in the plant and control room
- Identification of heat balance related instruments on applicable drawings
- Inclusion of heat balance instrument related information in work control documents

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- Reviewing the recent heat balance events and the effects on the heat balance calculation due to failure or removal of related instruments with maintenance, operations and engineering personnel
- Development of a heat balance related instrumentation trending program, utilizing both computer resources and other trending methods.

ADDITIONAL INFORMATION

Failed Component Identification: CRD System Flow Transmitter
 Manufacturer: Rosemount
 Model: 1151DP5D22MBGE2
 Serial: 37090

Previous Similar Event: LER 50-388 / 95-003-00 documented that shift average power exceeded rated CTP due to feedwater flow instrument problem.