

# CATEGORY 1

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ACCESSION NBR: 9601170097      DOC. DATE: 96/01/10      NOTARIZED: NO      DOCKET #  
 FACIL: 50-387 Susquehanna Steam Electric Station, Unit 1, Pennsylvania      05000387  
 AUTH. NAME      AUTHOR AFFILIATION  
 WEHRY, R.R.      Pennsylvania Power & Light Co.  
 STANLEY, H.G.      Pennsylvania Power & Light Co.  
 RECIP. NAME      RECIPIENT AFFILIATION

SUBJECT: LER 95-015-00: on 951211, non-conservancy in heat balance calculation caused impact on rated core thermal power. Created in-house technical basis for CTP calculation & conducted appropriate training. W/960110 ltr.

DISTRIBUTION CODE: IE22T      COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 5  
 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

NOTES: 05000387

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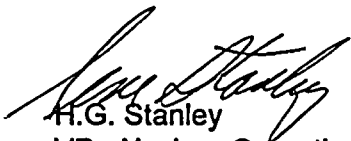
January 10, 1996

U.S. Nuclear Regulatory Commission  
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SUSQUEHANNA STEAM ELECTRIC STATION  
LICENSEE EVENT REPORT 50-387/95-015-00  
PLAS - 660 FILE R41-2

Docket No. 50-387  
License No. NPF-14

Attached is Licensee Event Report 95-015-00. This report is being made pursuant to NRC Document SSINS #0200, "Discussion Of Licensed Power Level", in that a non-conservatism in the heat balance calculations for Susquehanna Units 1 and 2 may have resulted in the thermal power level for the units being exceeded by up to 1.8 MWt. An administrative limit of 3439 MWt (versus a licensed power level of 3441 MWt) was imposed on the units.

  
H.G. Stanley  
VP - Nuclear Operations

Attachment

RRW/dmd

cc: Mr. T. T. Martin  
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P.O. Box 35  
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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), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Susquehanna Steam Electric Station - Unit 1						DOCKET NUMBER(2) 0 5 0 0 0 3 8 7 1			PAGE (3) OF 0 4		
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TITLE (4)  
Non-Conservancy In Heat Balance Calculation Impact On Rated Core Thermal Power

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)
1	2	1	1	9	5	9	5	0	SSSES - Unit 2		0 5 0 0 0 3 8 8
1	2	1	1	9	5	9	5	0			0 5 0 0 0 3 8 8

OPERATING MODE (9) 1

POWER LEVEL (10) 1 0 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following) (11)

<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(b)
<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)
<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)	<input checked="" type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 366A)
<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	SSINS #0200
<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	
<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(v)	

(LICENSEE CONTACT FOR THIS LER (12))

NAME: Richard R. Wehry - Nuclear Licensing Engineer

TELEPHONE NUMBER: 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

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 December 11, 1995, with Unit 1 and Unit 2 in Condition 1 (Power Operation) at 100% power, evaluation of industry information for applicability to Susquehanna concluded that a non-conservatism in the heat balance equations may have resulted in exceeding the licensed shift average core thermal power (CTP) by up to 1.8 MWt. Specifically, the energy inputs to the reactor control volume from Reactor Recirculation Pump seal flow from the Control Rod Drive system and Reactor Water Cleanup Pump purge water flow from the Condensate Transfer system had not been included in the heat balance calculation. The discovered condition was attributed to reliance on the General Electric (GE) CTP Calculation and acceptance of the validity and applicability of the GE model and acceptance tests; and the lack of clear understanding within PP&L that a rigorous in-house CTP Calculation design basis was required and the lack of evaluation of impacts to the CTP as a result of changes to the plant. An administrative limit of 3439 MWt (versus a licensed power level of 3441 MWt) was imposed on the units. No licensing safety limits were approached during the units' operating cycles and, as such, there were no safety consequences or compromises to public health or safety. Corrective actions include creating an in-house technical basis for the CTP Calculation and conducting appropriate training; updating the computer and manual CTP Calculation, as necessary, (based on the new CTP Calculation technical basis); training appropriate personnel concerning the importance of a questioning attitude in using vendor supplied information and management's expectation that personnel identify conditions found to not have established bases; reviewing past modifications for any potential impacts to the CTP Calculation; and enhancing the modifications program to ensure that future changes are evaluated for potential impact to the CTP Calculation.

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

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), U.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)  Unit 1  Susquehanna Steam Electric Station	DOCKET NUMBER (2)  0   5   0   0   0   3   8   7	LER NUMBER (6)						PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER						
		9   5   —	0   1   5   —	0   0	2	OF	4			

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

**DESCRIPTION OF EVENT**

On December 11, 1995, with Unit 1 and Unit 2 in Condition 1 (Power Operation) at 100% power, evaluation of industry information for applicability to Susquehanna concluded that a non-conservatism in the heat balance equations for both units may have resulted in exceeding the licensed shift average core thermal power (CTP) by up to 1.8 MWt. Specifically, the energy inputs to the reactor control volume from Reactor Recirculation (EISS Code: AD) Pump seal flow from the Control Rod Drive (CRD; EISS Code: AA) system and Reactor Water Cleanup (RWCU; EISS Code: CE) Pump purge water flow from the Condensate Transfer (EISS Code: SC) system had not been included in the heat balance calculation.

**CAUSE OF EVENT**

The discovered condition was attributed to:

- Reliance on the General Electric (GE) CTP Calculation and acceptance of the validity and applicability of the GE model and acceptance tests;
- Lack of clear understanding within PP&L that a rigorous in-house CTP Calculation design basis was required and the lack of evaluation of impacts to the CTP Calculation as a result of changes to the plant.

**REPORTABILITY / ANALYSIS**

The discovered condition was 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. Evaluation of the condition concluded that the shift average CTP for each unit may have resulted in the exceeding of the licensed MWt limit by up to 1.8 MWt during their operating cycles.

There were no safety consequences or compromises to public health or safety as a result of this condition since no licensing safety limits were approached during the operating cycles. This is based on the fact that the assumed power level used for initial conditions in all transient safety and LOCA analyses is the

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

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)						PAGE (3)		
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Unit 1  Susquehanna Steam Electric Station	0 5 0 0 0 3 8 7	9 5	0 1 5	0 0			3	OF	4	

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

licensed power level plus 2%. At no time would the 1.8 MWt non-conservancy have resulted in exceeding 102% rated CTP (i.e., 2% of the rated CTP of 3441 corresponds to 69 MWt).

An administrative limit of 3439 MWt (versus 3441 MWt) was imposed on both Susquehanna units.

In accordance with guidance provided by NUREG 1022, Supplement 1, Item 14.1, the required submission date for this report was determined to be January 10, 1996.

**CORRECTIVE ACTIONS**

An administrative limit of 3439 MWt (versus 3441 MWt) was imposed on both Susquehanna units as an interim corrective measure.

Corrective actions to prevent recurrence include:

- Creating an in-house technical basis for the CTP Calculation and conducting appropriate training;
- Updating the computer (plant, simulator and fuel) and manual CTP Calculation, as necessary, (based on the new CTP Calculation technical basis);
- Training appropriate personnel concerning the importance of a questioning attitude in using vendor supplied information and management's expectation that personnel identify conditions found to not have established bases;
- Reviewing past plant modifications for any potential impacts to the CTP Calculation;
- Enhancing the modifications program to ensure that future plant changes are evaluated for potential impact to the CTP Calculation.

**ADDITIONAL INFORMATION**

Failed Component Identification: None

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

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		YEAR	SEQUENTIAL NUMBER			REVISION NUMBER			OF			
Unit 1  Susquehanna Steam Electric Station	0   5   0   0   0   3   8   7	9   5	—	0	1	5	—	0	0	4	OF	4

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

Previous Similar Reported Events: LER 50-388 / 95-008-00 documented that Unit 2 shift average thermal power level was exceeded by up to 4 MWt (Note that this was 0.116% of rated CTP vice 0.0116% as stated in the LER (decimal error))

LER 50-388 / 95-003-00 documented that Unit 2 shift average thermal power exceeded rated CTP due to feedwater flow instrument problem.