

**JUL 25 2002**



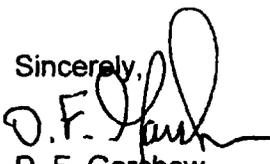
LR-N02-0243

U. S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

**SPECIAL REPORT 354/2002-005-00  
HOPE CREEK GENERATING STATION  
FACILITY OPERATING LICENSE NO. NPF-57  
DOCKET NO. 50-354**

Gentlemen:

This Special Report entitled "Potential to Exceed Licensed Power Level Due to Malfunction of The Crossflow Correction Factor Instrumentation", is being submitted pursuant to the requirements of License Conditions 2.C. (1) and 2.F. The attached Special Report contains no commitments.

Sincerely,  
  
D. F. Garchow  
Vice President - Operations

Attachment

/MGM

C Distribution  
LER File 3.7

IE22

### LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

Hope Creek Generating Station

05000354

1 OF 4

#### Potential to Exceed Licensed Power Level Due to Malfunction of The Crossflow Correction Factor Instrumentation

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED		
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER	
6	28	02	2002	- 005	- 00	07	25	02		05000	
									FACILITY NAME	DOCKET NUMBER	
										05000	
9. OPERATING MODE		1		20.2201(b)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)	
10. POWER LEVEL		100		20.2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)		50.73(a)(2)(x)	
				20.2203(a)(1)		50.36(c)(1)(i)(A)		50.73(a)(2)(iv)(A)		73.71(a)(4)	
				20.2203(a)(2)(i)		50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)		73.71(a)(5)	
				20.2203(a)(2)(ii)		50.36(c)(2)		50.73(a)(2)(v)(B)		X OTHER Specify in Abstract below or in NRC Form 366A	
				20.2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)			
				20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(D)			
				20.2203(a)(2)(v)		50.73(a)(2)(i)(B)		50.73(a)(2)(vii)			
				20.2203(a)(2)(vi)		50.73(a)(2)(i)(C)		50.73(a)(2)(viii)(A)			
				20.2203(a)(3)(i)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(B)			

#### 12. LICENSEE CONTACT FOR THIS LER

NAME Michael G. Mosier, Senior Licensing Engineer	TELEPHONE NUMBER (Include Area Code) 856-339-5434
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#### 13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

#### 14. SUPPLEMENTAL REPORT EXPECTED

YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
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#### 16. ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On June 28, 2002, at 1343 hours, a notification was made to the NRC to report a potential operation outside of License Condition 2.C (1), which authorizes PSEG Nuclear LLC to operate the facility at reactor core power levels not in excess of 3339 megawatts thermal (100 percent rated power).

On 5/26/02, operators identified that the feedwater cross-flow correction factor was lower after returning to normal operations from a down power evolution. Balance of plant indications led operators to suspect the indicated reactor power with the correction factor applied might be non-conservative. If the plant were operating with a non-conservative correction factor, the calculation of core thermal power was lower than actual power and resulted in the plant being operated above the license thermal power limit. Detailed analyses have confirmed that a malfunction of the crossflow instrumentation correction factor caused the plant to operate by as much as 0.47% overpower. The apparent cause of the event is attributed to a malfunction of the crossflow correction factor instrumentation as a result of cracked insulation becoming lodged between the crossflow meter's clamp and the pipe. Immediate corrective actions included removing crossflow from service and reducing power to the pre 1.4% uprate value. Additional corrective actions included the installation of new crossflow transducers and validation of current crossflow performance. The mounting configuration was changed to prevent similar occurrences.

This Special Report is being submitted in accordance with the requirements of License Condition 2.F. There were no safety consequences associated with this event since significant margins were available to all power distribution thermal limits.

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

FACILITY NAME (1)	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)	
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**TEXT** (If more space is required, use additional copies of NRC Form 366A) (17)

**PLANT AND SYSTEM IDENTIFICATION**

General Electric – Boiling Water Reactor (BWR/4)  
Feedwater System – EIS Identifier {SJ/–} \*

\*Energy Industry Identification System {EIS} codes and component function identifier codes appear as (SS/CCC)

**IDENTIFICATION OF OCCURRENCE**

Event Date: May 26, 2002  
Discovery Date: June 28, 2002

**CONDITIONS PRIOR TO OCCURRENCE**

Mode 1 – 100% power. No structures, systems, or components were inoperable at the time of the occurrence that contributed to the event.

**DESCRIPTION OF OCCURRENCE**

On 5/26/02, operators identified that the feedwater cross-flow correction factor was lower after returning to normal operations from a down power evolution (0.982 vice 0.987). Balance of plant indications led operators to suspect the indicated reactor power with the correction factor applied might be non-conservative. However, other plant indications did not support the conclusion of a non-conservative correction factor. If the plant were operating with a non-conservative correction factor, the calculation of core thermal power was lower than actual power and resulted in the plant being operated above the license thermal power limit. Detailed analyses have confirmed that a malfunction of the crossflow instrumentation factor caused the plant to operate by as much as 0.47% overpower.

This condition resulted from an error in the crossflow meter correction factor calculated by the crossflow computer and applied to the power calculation by the plant computer, which was recognized along with other plant parameters as a deviation from historical plant operation. A review of the historical data indicates that this is the only occurrence of a non-conservative failure of the crossflow meter. A review of Salem data indicates that this event has not occurred at Salem. The Salem installations did not use the same insulation method as Hope Creek and therefore are not susceptible to the same failure mechanism.

Once the condition was identified as possibly resulting in a non-conservative power calculation, the operations department took the appropriate steps to ensure conservative operations by removing crossflow from service and reducing power to pre 1.4% uprate value.

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**DESCRIPTION OF OCCURRENCE (Cont'd)**

Several plant parameters indicated conflicting evidence concerning the actual plant power level. Those that could be associated with an overpower condition were: 1) increased first stage pressure, 2) increased final feedwater temperature, 3) increase in condenser temperature rise, and 4) increase in secondary condensate pump flow. Other parameters that support correct crossflow operation and no overpower condition are: 1) low megawatts, 2) increase in #5 and #6 heater extraction pressures beyond what would be expected from the first stage pressure increase and, 3) increase in final feedwater temperature was attributed to the extraction pressure increase.

On June 28, 2002, at 1343 hours, a notification was made to the NRC to report a potential operation outside of License Condition 2.C (1), which authorizes PSEG Nuclear LLC to operate the facility at reactor core power levels not in excess of 3339 megawatts thermal (100 percent rated power).

**CAUSE OF OCCURRENCE**

The apparent cause of the event was a non-conservative correction factor caused by Crossflow error. A frequency scan was performed which indicated a degradation in the signal strength occurred. A failure mechanism was identified that could have resulted in the signal strength degradation and introduced the error in crossflow measurement of feedwater flow. Significant thermal cycling of the feed piping occurred during single loop operation when returning to power from the scheduled down-power event to repair the EHC system. This could have caused a foreign material to lodge between the crossflow meter's clamp and the pipe resulting in reduced load on the transducers thus introducing a bias. When the bracket was removed a large amount of insulation debris was found on top of the pipe. The source of the debris was calcium silicate insulation used around the crossflow meter.

**PRIOR SIMILAR OCCURRENCES**

Prior Hope Creek LERs and Special Reports were reviewed for similar potential overpower events. Several events that have resulted in Operating in Excess of 100 Percent of Rated Core Thermal Power have been reported for Hope Creek within the last two years. However, none of the previous events involved the cross flow correction factor. Previous corrective actions would not have prevented this event.

**SAFETY CONSEQUENCES AND IMPLICATIONS**

The power measurement error introduced by the error in the crossflow correction factor could have resulted in a potential overpower condition of up to 0.47%. A review of the Cycle 11 reload licensing report indicated that a significant margin was available to all power distribution

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

**SAFETY CONSEQUENCES AND IMPLICATIONS (Cont'd)**

fuel thermal limits. Therefore, since adequate margin to all power distribution fuel thermal limits remained during the time period, there was no safety significance associated with the potential overpower condition due to the non-conservative cross-flow correction factor. Based on the above this event did not present an undue risk to the health and safety of the public.

A review of this condition determined that a Safety System Functional Failure (SSFF) has not occurred as defined in Nuclear Energy Institute (NEI) 99-02.

**CORRECTIVE ACTIONS**

1. Immediate corrective actions included the installation of new crossflow transducers and validation of current crossflow performance. Configuration was changed to increase the low limit on the correction factor to prevent similar occurrences and Calcium Silicate Insulation was removed from crossflow meter.
2. Temporary insulation that had been installed on crossflow meter will be replaced with fiberglass cloth insulation. The Corrective Action Program will track this.
3. Crossflow preventive maintenance will be changed to add requirement to perform a Received Signal Strength Indicator (RSSI) scan when a plant transient where feedwater temperature decreases by greater than 100 degrees F or greater than 100 degrees F per minute is experienced. The Corrective Action Program will track this.

**COMMITMENTS**

The corrective actions cited in this Special Report are voluntary enhancements and do not constitute commitments.