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Public Service Electric and Gas Company P.O. Box 236 Hancocks Bridge, New Jersey 08038-0236

Nuclear Business Unit

NOV 29 1996

LR-N96388

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

Dear Sir:

HOPE CREEK GENERATING STATION
DOCKET NO. 50-354
UNIT 1
LICENSEE EVENT REPORT 96-024-00

This Licensee Event Report entitled "Potential Unavailability of 2 Electrical Divisions Following a LOP Due to Inoperability of 2 SSWS Vacuum Breakers" is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(v)(D).

Sincerely,

Mark Bezilla
General Manager -
Hope Creek Operations

LMK
SORC Mtg 96-109

C Distribution
LER File

9612050091 961128
PDR ADOCK 05000354
S PDR

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The power is in your hands.

LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1)

Hope Creek Generating Station

DOCKET NUMBER (2)

05000354

PAGE (3)

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TITLE (4)

Potential Unavailability of 2 Electrical Divisions Following a LOP Due to
Inoperability of 2 SSWS Vacuum Breakers

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
10	29	96	96	-- 024 --	00	11	28	96	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)		100	20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)(B)		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)		x 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

Lisa Kepley, Licensing Engineer

TELEPHONE NUMBER (Include Area Code)

(609) 339-1106

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS
X	BI	VACB	V030	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

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

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On October 29, 1996 at 0505 hours, the two redundant vacuum breakers on the 'A' Station Service Water System (SSWS) loop were tested and found inoperable. The 'A' SSWS loop was consequently declared inoperable and Technical Specification Action Statement (TSAS) 3.7.1.2 was entered. On November 1, 1996, it was discovered that following a Loss of Power (LOP), restart of the SSWS pumps without the vacuum breakers may potentially result in a failure of the 'A' SSWS loop. This in turn could result in two (2) out of four (4) electrical divisions being lost, one of which is credited in the licensing basis for accident mitigation during the first 10 minutes. As a result, on November 1, 1996 at 1807 hours, this condition was reported to the NRC under 10CFR50.72(b)(2)(iii), as an event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident. The apparent cause of the failure mechanism of the vacuum breakers is an accumulation of deposits on internal moving parts that prevented cycling of the valve. Corrective actions are in the areas of interim increased testing and evaluation of corrective measures that will be taken to provide reliable vacuum relief capability.

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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)
Station Service Water System: EA; EIIIS Identifier: BI

IDENTIFICATION OF OCCURRENCE

Event Date: October 29, 1996
Event Time: 0505 hours
Discovery Date: November 1, 1996

CONDITIONS PRIOR TO OCCURRENCE

Plant in OPERATIONAL CONDITION 1 (Power Operation)
Reactor Power 100% of rated

DESCRIPTION OF OCCURRENCE

On October 29, 1996 at 0505 hours, the two redundant vacuum breakers on the 'A' Station Service Water System (SSWS) loop were tested and found inoperable. The 'A' SSWS loop was consequently declared inoperable and Technical Specification Action Statement (TSAS) 3.7.1.2 was entered. At 1830 hours, one vacuum breaker was declared operable following repairs and testing. On October 31, 1996 at 0425 hours, the second vacuum breaker was declared operable.

The SSWS consists of two loops with 2 pumps, 2 heat exchangers, and 2 100% vacuum breakers per loop. The system is designed such that both loops with a single pump per loop, including both heat exchangers and a single vacuum breaker, are credited in the Updated Final Safety Analysis Report (UFSAR) to mitigate the consequences of an accident. After 10 minutes, a single loop with 2 pumps is all that is required. The function of the vacuum breaker is to open to vent the system following a LOP such that water hammer forces, from resultant transient conditions, remain within acceptable limits. The SSWS supports an associated closed loop cooling water system loop (SACS), which in turn each supports 2 electrical divisions and other safety related equipment.

On November 1, 1996, it was discovered that following a Loss of Power (LOP), restart of the SSWS pumps without the vacuum breakers may potentially result in a failure of the 'A' SSWS loop. This in turn could result in two (2) out of four (4) electrical divisions being lost, one of which is required during the first 10 minutes of accident recovery. As a result, on November 1, 1996 at 1807 hours, this condition was

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DESCRIPTION OF OCCURRENCE (cont'd)

reported to the NRC under 10CFR50.72(b)(2)(iii), as an event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident.

ANALYSIS OF OCCURRENCE

Two normally closed, normally energized, redundant vacuum breakers are provided on the highest point of the Safety Auxiliary Cooling System (SACS) heat exchanger downstream SSWS loop piping. These solenoid operated valves fail open on a LOP and reclose after a 60 second time delay when power is restored. These valves serve to reduce pressure surges caused by rejoining of the column separation of the fluid in the SSWS downstream of the SACS heat exchanger following a LOP.

On October 29, 1996, from 0505 hours until 1830 hours, a condition existed at Hope Creek Generating Station (HCGS) that alone could have prevented the fulfillment of a safety function. The two redundant vacuum breakers on the 'A' SSWS loop were stuck closed, and as a result, the 'A' SSWS loop was declared inoperable. Following a Loss of Power (LOP) accident, transient conditions without the vacuum breakers may potentially result in a failure of the 'A' SSWS loop such that two (2) out of four (4) electrical divisions could potentially be lost, one of which is credited in the UFSAR during the first 10 minutes of accident recovery.

The internal parts of the vacuum breaker are manufactured from 316 grade stainless steel. Inspection of the vacuum breakers indicated that the apparent failure mode is an accumulation of deposits on internal moving parts that prevented cycling of the valve. Each vacuum breaker is stroke time tested on a quarterly frequency. Maintenance history has shown that the 'A' SSWS loop valves have been rebuilt a total of six times, while the 'B' SSWS loop valves have been rebuilt twice. The valves were reworked during Hope Creek's sixth refueling outage during the winter of 1996. The valves successfully passed their inservice testing with no precursors of failure prior to the failures discussed above.

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CAUSE OF OCCURRENCE

The apparent cause of the vacuum breaker failures is an accumulation of deposits on internal moving parts that prevented cycling of the valve.

ASSESSMENT OF SAFETY CONSEQUENCES

An assessment of the safety consequences and implications of this condition was performed. There were no actual safety consequences because a LOP did not occur while the vacuum breakers were inoperable. Regarding potential safety significance, the loss of the vacuum breakers can potentially increase the pipe support loads beyond the current analyzed levels. This will result in an unanalyzed condition. If the loads are extremely high, the pipe supports could fail which could result in failure of the pressure boundary. This could results in the loss of the "A" SSWS loop and the end users of the SACS cooling water for the "A" SSWS loop.

PREVIOUS OCCURRENCES

There have been no reportable occurrences at Hope Creek Generating Station due to the failure of SSWS vacuum breakers in the past. There were no corrective actions previously identified that would have been expected to prevent this occurrence.

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CORRECTIVE ACTIONS

1. Both vacuum breakers on the 'A' SSWS loop were repaired and returned to service.
2. Following discovery of the 'A' SSWS loop vacuum breaker failures, the 'B' SSWS loop vacuum breakers were tested and performed satisfactorily. The 'B' SSWS loop vacuum breakers will be inspected during the next 'B' SSWS loop system outage.
3. Engineering is continuing to evaluate corrective measures that will be taken to provide reliable vacuum relief capability. A determination will be made by 3/24/97.
4. The inservice testing frequency for the SSWS vacuum breakers has been increased from quarterly to monthly. The increased stroking frequency will mitigate the build up of debris on the existing valve plungers until permanent corrective actions are taken.