



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

Hope Creek Generating Station

January 4, 1995

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

Dea. Sir:

HOPE CREEK GENERATING STATION  
DOCKET NO. 50-354  
UNIT NO. 1  
LICENSEE EVENT REPORT 94-018-00

This Voluntary Licensee Event Report is being submitted due to the discovery of a design deficiency which affected the redundant Service Water System Traveling Screens.

Sincerely,

A handwritten signature in dark ink, appearing to read "R.J. Hovey", written over the printed name.

R.J. Hovey  
General Manager -  
Hope Creek Operations

LAA/

Attachment  
SORC Mtg. 95-001  
C Distribution

The Energy People

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PDR ADDCK 05000354  
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LICENSEE EVENT REPORT																									
FACILITY NAME (1) HOPE CREEK GENERATING STATION										DOCKET NUMBER (2) 0 5 0 0 0 3 5 4										PAGE (3) 1 OF 4					
TITLE (4): Discovery of a design defficiency common to the redundant Station Service Water Travelling Screens.																									
EVENT DATE (5)					LER NUMBER (6)					REPORT DATE (7)					OTHER FACILITIES INVOLVED (8)										
MONTH	DAY	YEAR	YEAR	*	NUMBER	*	REV	MONTH	DAY	YEAR	FACILITY NAME(S)					DOCKET NUMBER(S)									
1	2	0	7	9	4	9	4	-	0	1	8	-	0	0	0	1	0	4	9	5					
OPERATING (9) MODE			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR: (CHECK ONE OR MORE BELOW) (11)																						
POWER LEVEL %			1			20.402(b)			20.405(c)			50.73(a)(2)(iv)			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)(vii)			xx OTHER (Specify in Abstract below and in Text)													
			20.405(a)(1)(iii)			50.73(a)(2)(i)(B)			50.73(a)(2)(viii)(A)																
			20.405(a)(1)(iv)			50.73(a)(2)(ii)			50.73(a)(2)(viii)(B)																
20.405(a)(1)(v)			50.73(a)(2)(iii)			50.73(a)(2)(x)																			
LICENSEE CONTACT FOR THIS LER (12)																									
NAME Lou Aversa, Senior Staff Engineer - Technical										TELEPHONE NUMBER 6 0 9 3 3 9 3 3 8 6															
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE NOTED IN THIS REPORT (13)																									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS?	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS?																
				////					////																
SUPPLEMENTAL REPORT EXPECTED? (14) YES					NO	X	DATE EXPECTED (15)					MONTH	DAY	YEAR	//////////										
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### ABSTRACT (16)

On Wednesday, December 7, 1994, a design deficiency was discovered associated with the Service Water (SW) System Traveling Screen Spray Wash Booster Pump flow sensing device. The determination of a design deficiency was made while System Engineering was performing a root cause investigation into a setpoint discrepancy noted during a calibration of the flow sensor. The deficiency could result in the SW traveling water screen (TWS) operating without the booster pump being in service. Interim actions were initiated to have operations personnel verify booster pump operation hourly for all in service TWS from the control room and increased frequency of operator rounds which includes a check of pump flow and spray nozzle cleanliness locally. The root cause of this event is a design deficiency incorporated into the initial plant design. A design change has been prepared to eliminate the use of the flow switch in the traveling screen logic and verify booster pump operation via pump breaker position.

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PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor (BWR/4)  
 Station Service Water System (EA) EIIIS IDENTIFIER (CC)

IDENTIFICATION OF OCCURRENCE

TITLE (4): Discovery of a design deficiency common to the redundant  
 Station Service Water Traveling Screens

Event Date: 12/7/94

Event Time: 1600

This LER was initiated by Incident Report No. 94-233

CONDITIONS PRIOR TO OCCURRENCE

Plant in OPERATIONAL CONDITION 1 (Power Operation)  
 Reactor Power 100% of rated, 1109 MWe

DESCRIPTION OF OCCURRENCE

On Wednesday, December 7, 1994, a design deficiency was discovered associated with the Service Water (SW) System Traveling Screen Spray Wash Booster Pump flow sensing device. The determination of a design deficiency was made while System Engineering was performing a root cause investigation into a setpoint discrepancy noted during a calibration of the flow sensor. The deficiency could result in the SW traveling water screen (TWS) operating without the booster pump being in service. Interim actions were initiated to have operations personnel verify booster pump operation hourly for all in service TWS from the control room and increased frequency of operator rounds which includes a check of pump flow and spray nozzle cleanliness locally.

ANALYSIS OF OCCURRENCE

The Station Service Water System (SSWS) provides cooling water for all station equipment via the Safety Auxiliaries Cooling System (SACS). The SSWS is comprised of two redundant loops each containing two Station Service Water Pumps. Each pump draws in river water through a Traveling Water Screen (TWS) which removes large debris from the water stream. The main pump discharge flows through a strainer which removes small debris, which may have passed through the screen, before the water is supplied to the SACS heat exchangers. The TWS utilizes a spray wash system to remove debris from the screen elements as they rotate up from the main pump suction stream. The motive force for the spray wash system is provided by a booster pump which takes suction on the service water system downstream of the strainer. This filtered water is pumped to spray headers along the length of the screen housing to ensure the entire screen is cleaned and the debris is removed and

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ANALYSIS OF OCCURRENCE

not passed to the pump suction side of the screen. To ensure the screen is not rotated without the spray wash system, a flow sensor on the discharge of the booster pump was provided to ensure the pump was running when the screen was started.

The flow sensing devices used to verify booster pump operation have experienced an increased failure rate in recent years. The flow sensors were being replaced by maintenance personnel as required, and Engineering was in the process of reviewing the failures to either revise the material requirements for the flow sensor or change the design entirely. During replacement of one of the flow sensors it was discovered that an incorrect setpoint had been established for the particular sensor. Each sensor is unique in that each device output voltage can vary for the same sensed flow. This variation is due to inconsistencies in material and construction of the device. The device was typically supplied with its own unique calibration curve that provides the specific flow to output voltage for each sensor. The device that was being replaced was found to have been calibrated using the old sensors calibration curve rather than its own. A review conducted by engineering determined that the output corresponded to a flow of 18 GPM rather than the specified 45 GPM. The setpoint calculation that specified the setpoint of 45 GPM did not state the basis for the setpoint or the flow that would be present without the booster pump running. It was decided to determine the actual flow without the booster pump to determine if the 18GPM setpoint could have met the design intent. When the test was run it was discovered that approximately 150 GPM flow from the main pump was achieved without the booster pump operating. The 150 GPM from the main pump satisfied the logic and would allow the screen to rotate without the booster pump running. Actions to verify booster pump operation by alternate means were immediately initiated. These actions included hourly verification of booster pump operation via indications in the main control room, as well as periodic local verification of pump operation and flow indications locally at the service water structure.

The root cause of the original setpoint discrepancy could not be determined. It is believed that the setpoint was based on calculation rather than actual flow measurements. The range of the flow sensing device is below the range needed for this particular application. Engineering has developed a design change package that will verify booster pump operation via breaker position.

A review of operating history of the traveling water screens and booster pumps did not reveal any previous problems with mis-operation of the booster pumps. The booster pumps are included in the In Service Inspection program which includes quarterly pump performance testing.

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SAFETY SIGNIFICANCE

This event posed minimal safety significance. The flow sensor is not an integral part of traveling screen operation. The sensors primary function is to prevent screen operation in the event of a booster pump malfunction. Based on a review of previous operating history, incident reports and In Service Inspection testing results of the booster pumps it has been determined that the deficiency did not affect proper service water system operation. This voluntary report was issued due to the deficiency being applicable to all four service water traveling screens, however, this condition alone would not have prevented fulfillment of the safety function nor would it alone affect operation of all four service water pumps.

PREVIOUS OCCURRENCES

There has been no previous event reported for this condition.

APPARENT CAUSE OF OCCURRENCE

The root cause of this event is a design deficiency incorporated into the initial plant design.

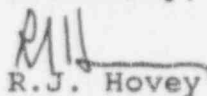
CORRECTIVE ACTIONS

Engineering has revised the design eliminating the flow sensor and will utilize the booster pump breaker position in the traveling screen logic.

Planning and Maintenance departments are currently developing a schedule for implementing the design change.

Interim actions to verify proper operation of the booster pumps are being performed by operations department personnel.

Sincerely,



R.J. Hovey  
General Manager -  
Hope Creek Operations

SORC Mtg. 95-001  
Recommended approval: Yes  
C Distribution