PSEG

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

Hope Creek Generating Station

November 20, 1990

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

Dear Sir:

HOPE CREEK GENERATING STATION
DOCKET NO. 50-354
UNIT NO. 1
LICENSEE EVENT REPORT 90-022-00

This Licensee Event Report is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(iv).

Sincerely,

C.P. Johnson
General Manager -
Hope Creek Operations

RBC/

Attachment
SORC Mtg. 90-106

C Distribution

IE22
1/1

LICENSEE EVENT REPORT

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
HOPE CREEK GENERATING STATION	0 5 0 0 0 3 5 4	1 OF 5

TITLE (4): ENGINEERED SAFETY FEATURES ACTUATION: AUTO START OF "A" CORE SPRAY PUMP DURING SURVEILLANCE TEST DUE TO PERSONNEL ERROR

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 0	2 2	9 0	9 0	-	0 2 2	- 0 0	1 1	2 0	9 0		

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR: (CHECK ONE OR MORE BELOW) (11)			
POWER LEVEL	1 0 0	20.402(b)	20.405(c)	XX 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)	OTHER (Specify in Abstract below and in Text)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	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	TELEPHONE NUMBER
Richard Cowles, Senior Staff Engineer - Technical	6 0 9 3 3 9 3 4 3 1

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 XX	DATE EXPECTED (15)	MONTH	DAY	YEAR	\\\\\\\\\\\\\\\\
							\\\\\\\\\\\\\\\\

ABSTRACT (16)

On 10/22/90 at 1405, during the course of a Maintenance Department - Controls surveillance test, an inadvertent auto-start of the "A" Core Spray pump occurred. After verifying the initiating cause of the auto-start, control room personnel stopped the pump and returned the Core Spray system to a normal (standby) configuration. The Core Spray system did not inject to the reactor vessel. Investigation subsequent to the event determined that the root cause of this occurrence to be personnel error, compounded by human factors concerns in the relay cabinet in which the subject surveillance took place. The procedureally required sequence of independent verification also contributed to the error. During preparation for the surveillance, a controls technician connected a test switch lead to the wrong terminal on a relay being tested. This resulted in the relay becoming energized when the test switch was closed later in the testing process. Corrective actions include counselling for the technician, ensuring that a previously identified design change to the subject relay cabinet is scheduled for the next refueling outage, revising sequence of independent verification in the test procedure, and reviewing this incident during the course of controls technician continuing training.

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor (BWR/4)
Core Spray System (EIIS Designation: BM)

IDENTIFICATION OF OCCURRENCE

Engineered Safety Features Actuation: Auto Start of "A" Core Spray Pump During Surveillance Test Due to Personnel Error

Event Date: 10/22/90
Event Time: 1405
This LER was initiated by Incident Report No. 90-140

CONDITIONS PRIOR TO OCCURRENCE

Plant in OPERATIONAL CONDITION 1 (Power Operation), Reactor Power 100%, Unit Load 1095MWe.

DESCRIPTION OF OCCURRENCE

On 10/22/90 at 1405, an Engineered Safety Features (ESF) actuation occurred when the "A" Core Spray pump was inadvertently started. Control room personnel immediately responded to the overhead alarms received, determined the initiating cause of the event (performance of a Controls Department surveillance), stopped the pump, and returned the Core Spray system to a normal (standby) alignment. Because of reactor vessel / core spray system differential pressure, the Core Spray system did not inject to the reactor vessel. A four hour non-emergency report was made in accordance with 10CFR50.72 due to this event being an ESF actuation.

APPARENT CAUSE OF OCCURRENCE

The primary cause of this occurrence was a personnel error on the part of the controls technician who was performing the surveillance test. Testability concerns in the relay cabinet in which the test was being conducted contributed to the personnel error. Additionally, the procedurally required sequence of independent verification of test switch lead installation contributed the event.

ANALYSIS OF OCCURRENCE

Two controls technicians (one qualified, one in training) were performing a monthly channel calibration surveillance on an "A" Core Spray pump start time delay relay for emergency power. The qualified technician was serving as the independent verifier; the technician-in-training was performing the test as a training evolution, and a controls training supervisor was observing performance of the test. The training supervisor had no direct involvement in performing the test, but was merely observing as part of the qualification process for the technician-in-training.

In preparation for this test, the technician-in-training was required to land a test switch lead on relay terminal B1. Prior to landing this lead, the qualified technician independently verified the correct relay and associated terminal. When actually landing the test switch lead, the technician-in-training incorrectly landed the lead on terminal T1, establishing an open circuit around the relay. When the test switch was closed as per the procedure, the circuit was completed, energizing the pump start relay, and the "A" Core Spray pump started.

Investigation subsequent to the event focused on the qualification of the technicians, correctness of the procedure, and human factors conditions inside the relay cabinet in which the test was being performed.

The qualifications of the technicians did not contribute to this incident. The qualified technican served as the independent verifier, and correctly followed the testing procedure in identifying the proper relay/terminal points. The technician in training, although not qualified on that particular procedure, is an experienced technician, and it is within the skill level of that technician to lift/land testing leads.

The testing procedure was reviewed for adequacy of independent verification. It was determined that the steps for verification of landing the test switch leads, while correct as written, could be enhanced to include a second verification after the leads are landed.

ANALYSIS OF OCCURRENCE, CONT'D

The ambient conditions in the relay cabinet in which this test was performed contributed to the test switch lead being mis-landed. Controls technicians must enter the relay cabinet to connect the test switch leads. Actual room for physical movement inside the cabinet is very limited, and internal cabinet lighting is obscured when a technician is inside the cabinet, making relay and terminal identification difficult. The ambient conditions in the cabinet do not, however, absolve the controls technician of the responsibility for proper identification of the correct terminals. The lack of space and poor lighting is a recognized problem, and efforts have been ongoing since 1987 to address testability concerns in this and similar relay cabinets.

PREVIOUS OCCURRENCES

A similar incident occurred in 1987 that resulted in a turbine trip and reactor scram from 100% power. A controls technician placed a meter lead on an incorrect relay terminal, creating a short circuit which energized the main turbine trip relay. As a result of that event, and recommendations of the BWR Owners Group Scram Frequency Reduction Committee, a design change was initiated in 1987 to install test blocks external to selected high risk relay and instrumentation panels. A variety of panels were identified and prioritized for upgrade under this design change. Some of the panels were upgraded during the second refueling outage in 1989; the remainder are scheduled to be upgraded during the third refueling outage, begining at the end of 1990. The relay cabinet described in this report is one of the cabinets identified for upgrade under this design change.

SAFETY SIGNIFICANCE

There was no safety significance associated with the events described in this report. At rated reactor power and vessel pressure, core spray pump discharge pressure is not high enough to result in injection to the reactor vessel. Additionally, the "A" Core Spray loop had been declared inoperable for the performance of the surveillance test which initiated the pump start.

CORRECTIVE ACTIONS

1. The controls technician responsible for the correct performance of the surveillance test was counselled with respect to his involvement in this incident. Additionally, during a maintenance department meeting, the controls technician discussed this event with all controls technicians. Included in this discussion was a synopsis of the errors made and lessons learned from the event. During this meeting, the Maintenance Engineer - Controls communicated his expectations of all technicians when performing surveillances requiring lifted leads, jumpers, and meter installation.

2. The procedure used to perform the subject test will be revised, and similar procedures reviewed for enhancement, with respect to the sequence of independently verifying correct lead and test equipment installation.

3. As previously noted, a design change was initiated in 1987 to install external text boxes on a variety of high risk relay panels in the plant. Some of the identified panels were upgraded during the stations' second refueling outage; the remainder (including the relay cabinet described in this report) will be upgraded during the third refueling outage.

4. A review of this report will be incorporated into controls technician continuing training to ensure lessons learned are communicated to all technicians.

Sincerely,

C.P. Johnson
General Manager -
Hope Creek Operations

RBC/

SORC Mtg. 90-106