PSE&G

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

Hope Creek Generating Station

April 20, 1995

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 95-006-00

This Licensee Event Report is being submitted pursuant to the requirements of 10CFR 50.73(a)(2)(iv).

Sincerely,

R. J. Hovey
General Manager -
Hope Creek Operations

LAA/
SORC Mtg. 95-026
C Distribution

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95-2173 (25M) 12-94

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 System Actuation - Shutdown Cooling System Isolation due to procedural non-compliances.

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)
0 3	2 3	9 5	9 5	- 0 0 6	- 0 0	0 4	2 0	9 5		

OPERATING (9) MODE	4	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR: (CHECK ONE OR MORE BELOW) (11)			
POWER LEVEL %	0 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)(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	TELEPHONE NUMBER
Lou Aversa, Senior Staff Engineer - Technical	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 Thursday, March 23, 1995, Control Room personnel were in the process of transferring power supply infeed breakers, to a 480 VAC unit substation, from the alternate feeder breaker to the normal feeder breaker. When the transfer was attempted the 480 volt normal infeed breaker did not close causing a loss of the 480 VAC unit substation (USS) and all of the motor control centers (MCC's) fed from the USS also were de-energized. One of the de-energized MCC's caused the in service Reactor Protection System (RPS) motor generator set to trip. This resulted in a loss of power to one RPS bus which powers the Residual Heat Removal Shutdown Cooling (RHR SDC) isolation interlocks. Upon the loss of power the SDC isolation valves closed. Operations personnel restored the bus via the alternate feeder breaker and restored shutdown cooling to operation. The causes of this event are procedural non-compliances related to not adhering to the specified method of transferring the infeed breakers as prescribed in station operating procedures, and inadequate risk assessment by the scheduling department for emergent activities. A rationalization that previous operating practices were acceptable in lieu of procedural guidance, inadequate lubrication of the breaker racking mechanism and inadequate knowledge and guidance for equipment operators who made the breaker ready for service also contributed to this event. Personnel involved in the procedural non-compliances will be disciplined as appropriate. In addition, implementation of station procedures regarding shutdown safety guidelines will be reviewed with scheduling personnel. The breaker preventive maintenance procedure will be checked for frequency of lubrication of the racking mechanism, and appropriate upgrades to the equipment operator training will be implemented.

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor (BWR/4)
Residual Heat Removal - Shutdown Cooling Mode BC EIIS Identifier BO
Reactor Protection System SB EIIS Identifier JE
480 Volt AC Distribution NG EIIS Identifier EC

IDENTIFICATION OF OCCURRENCE

TITLE (4): Engineered Safety System Actuation - Shutdown Cooling System Isolation due to procedural non-compliances.

Event Occurrence: March 23, 1995
Event Time: 1822

CONDITIONS PRIOR TO OCCURRENCE

Plant in OPERATIONAL CONDITION 4 (Cold Shutdown)
Reactor Power 0% of rated, 0 MWe

DESCRIPTION OF OCCURRENCE

On Thursday, March 23, 1995, Control Room personnel were in the process of transferring power supply infeed breakers, to a 480 VAC unit substation, from the alternate feeder breaker to the normal feeder breaker. When the transfer was attempted the 480 volt normal infeed breaker did not close causing a loss of the 480 VAC unit substation (USS) and all of the motor control centers (MCC's) fed from the USS also were de-energized. One of the de-energized MCC's caused the in service Reactor Protection System (RPS) motor generator set (MG set) to trip. This resulted in a loss of power to one RPS bus which powers the Residual Heat Removal Shutdown Cooling (RHR SDC) isolation interlocks. Upon the loss of power the SDC isolation valves closed. Operations personnel restored the bus via the alternate feeder breaker, reset the isolation logic and restored shutdown cooling to operation.

ANALYSIS OF OCCURRENCE

The normal power for the Shutdown Cooling System isolation logic is supplied via the Reactor Protection System (RPS) motor - generator (MG) set. The isolation system is designed to actuate upon de-energization of the logic, hence the electrical power for the system does not require a dedicated 1E power source. The MG sets are powered from separate 480 VAC non-1E MCC's. One of the MCCs powering the "B" MG Set is powered from a USS that in turn can be powered from two separate sources. Unlike some higher voltage busses with dual infeeds designed to fast transfer, the USS infeed feeder breakers do not have a fast transfer which requires the de-energization of a USS when transferring power sources.

ANALYSIS OF OCCURRENCE

An investigation into this loss of shutdown cooling event determined that procedural non-compliances were the root causes of this event. Additionally, An equipment malfunction was also noted that contributed to the failure of the normal supply breaker to close causing the bus de-energization.

The 480 VAC unit substation, that powers the "B" RPS MG set, can be powered from a tie breaker that connects it to a similar 480 VAC unit substation. The two USSs are powered from separate 4.16 KV busses. To protect the USSs from excessive current flow, only two of the three infeed breakers can be closed at a time to ensure the busses are not paralleled from two separate upstream bus sections. Closing of all three breakers is prevented through a logic that will not allow a breaker to close unless one of the remaining two breakers is open. There is no logic that will trip a breaker if all three are closed. Procedures for transferring the infeeds requires that the bus be de-energized prior to performing the swap. This requires removal of all the motor control centers from service prior to initiating a transfer. The procedure, as well as standard operating practices requires operations personnel to review the loads being removed from service prior to de-energizing a bus. The review should identify any essential loads and initiate mitigating actions to preclude any adverse conditions that would result from de-energization of the bus. Had a more thorough review of the bus loads been conducted, the impact of the loss of the "B" RPS MG set would have resulted in additional actions to prevent an interruption of shutdown cooling or the infeed breaker swap would have been delayed until shutdown cooling was no longer required.

In the past, a method was discovered to perform a rapid infeed breaker transfer by utilizing a part of the above logic. It was learned that if the open breaker CLOSE button was held depressed the logic would prevent closing until one of the other breakers were opened. By holding the CLOSE button then tripping one of the closed breakers, the logic for the breaker that was being closed would be satisfied as soon as the tripped breaker opened. This method of manipulating the control logic was performed successfully on previous occasions, without the loss of any bus loads. The failed transfer during this event was due to a breaker malfunction. The breaker they were attempting to close was being locked out by a mechanical interlock on the breaker racking mechanism. The mechanism prevents the breaker from operating when the racking mechanism is engaged. When the racking mechanism is removed, the interlock should spring return to its normal position, which did not occur. A check of the interlock indicated inadequate lubrication as the cause of it not returning to normal. A review of the lesson plans and breaker racking procedure did not contain any check of the interlock to ensure its return to normal. As the rapid transfer had

ANALYSIS OF OCCURRENCE

worked well in the past, it was rationalized that it was acceptable to transfer the infeeds to the USS in this manner. The risks and affects associated with losing power to the bus, in the event of a failure to transfer, were not adequately evaluated.

The need to restore the bus infeeds to normal resulted from emergent work identified during the shutdown. An inspection of the infeed power supply transformers had been assigned due to voltage transient seen during a previous unrelated event. Personnel who had scheduled this activity did not account for a dead bus transfer as they were aware of the rapid transfer method employed by operations and assumed it would be done again in similar fashion. In addition, scheduling had removed the "A" RPS MG set from service, for bearing replacement, concurrently with the bus transfers. Station Administrative procedures are intended to prevent a reduction of availability of required equipment for shutdown safety to this extent. Had the administrative procedure guidelines been followed, the bus power supply inspections would not have been scheduled at this time.

APPARENT CAUSE OF OCCURRENCE

The causes of this event are procedural non-compliances. Control room personnel did not perform the bus transfer as specified in their operating procedures. Outage scheduling did not implement the guidelines of administrative procedures regarding the scheduling of emergent activities that can reduce the available equipement required for shutdown safety. Additional factors which contributed to this event are, less than adequate assessment of the consequences of a failed transfer, and the rationalization that previous operating practices were acceptable in lieu of procedural guidance. Inadequate lubrication of the breaker racking mechanism resulted in the breaker failing to close. Inadequate knowledge and guidance regarding this type of breaker racking mechanism resulted in the equipment operators thinking that the breaker was ready for service when it actually was not.

SAFETY SIGNIFICANCE

This event posed minimal safety significance. Shutdown cooling was restored in a timely fashion with minimal increase in reactor coolant temperature. All systems functioned as required during this event.

PREVIOUS OCCURRENCES

There has been two previous events of a loss of shutdown cooling due to a loss of the motor control center powering the RPS MG set. See LERs 94-006-00 and 90-004-00. Both events were the result of equipment malfunctions.

CORRECTIVE ACTIONS

Personnel involved in the procedural non-compliance and inadequate risk assessment will be disciplined as appropriate.

Operations Department will reaffirm the need to evaluate risk and plan for contingencies when bus power supplies are transferred.

The review of emergent work and the implementation of station guidelines for assessing shutdown safety guidelines will be reviewed with scheduling personnel.

The breaker preventive maintenance procedure will be checked for frequency of lubrication of the racking mechanism.

The remaining similar style breakers have been verified to be racked in properly.

Provide appropriate upgrades to the equipment operator training regarding the racking in and operational checks for draw out type circuit breakers.

Sincerely,

for RJH

R.J. Hovey
General Manager -
Hope Creek Operations

SORC Mtg. 95-026
Recommended approval: Yes
C Distribution