



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

Nuclear Business Unit

MAR 25 1996

LR-N96084

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

Attn.: Document Control Desk

Dear Sir:

HOPE CREEK GENERATING STATION
LICENSE NO. NPF-57
DOCKET NO. 50-354
UNIT NO. 1
LICENSEE EVENT REPORT NO. 95-042-00

This Licensee Event Report entitled "Fuel Bundle Confirmed to be Misoriented during an Operating Cycle" is being submitted on a voluntary basis.

Sincerely,

N. E. Reddemann
General Manager -
Hope Creek Operations

Attachment LER
SORC Mtg. 96-039
JJK

C Distribution
LER File 3.7

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The power is in your hands.

JE221

EXPIRES 04/30/98

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 HR
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

FACILITY NAME (1)

HOPE CREEK GENERATING STATION

DOCKET NUMBER (2)

05000-354

PAGE (3)

1 OF 4

TITLE (4)

Fuel Bundle Confirmed to be Misoriented during an Operating Cycle

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
12	12	95	95	-- 042	-- 00	03	25	96	FACILITY NAME	DOCKET NUMBER
										05000
									FACILITY NAME	DOCKET NUMBER
										05000
OPERATING MODE (9)		5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)							
			20.2201(b)			20.2203(a)(2)(v)			50.73(a)(2)(i)	
			20.2203(a)(1)			20.2203(a)(3)(i)			50.73(a)(2)(ii)	
			20.2203(a)(2)(i)			20.2203(a)(3)(ii)			50.73(a)(2)(iii)	
			20.2203(a)(2)(ii)			20.2203(a)(4)			50.73(a)(2)(iv)	
			20.2203(a)(2)(iii)			50.36(c)(1)			50.73(a)(2)(v)	
			20.2203(a)(2)(iv)			50.36(c)(2)			50.73(a)(2)(vii)	
POWER LEVEL (10)		0							73.71	
									X OTHER	
									Specify in Abstract below or in NRC Form 366A Voluntary Report	

LICENSEE CONTACT FOR THIS LER (12)

NAME

Jeff Keenan, Licensing

TELEPHONE NUMBER (Include Area Code)

609 - 339 - 5429

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRCDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRCDS

SUPPLEMENTAL REPORT EXPECTED (14)

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

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

On December 12, 1995, one reactor core fuel bundle was verified to be misoriented by 180 degrees. This bundle was confirmed to have been misoriented for the last cycle of operation. The event occurred during the last refueling outage (RFO5) when a refuel bridge operator failed to correctly rotate a bundle when moving it within the reactor core. In addition, the independent verification processes failed to identify the error. There was no safety consequence to plant operation due to this event; however, to share industry information this report is being submitted voluntarily.

Causes of this event are less than adequate procedural and human factor controls being established for the core verification process. Corrective actions included revisions to procedures and additional training with personnel performing core verification activities. In addition, an assessment of fuel movement practices will be completed prior to the next refueling outage.

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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)

IDENTIFICATION OF OCCURRENCE

TITLE: Fuel Bundle Confirmed to be Misoriented during an Operating Cycle

Event Date: December 12, 1995

CONDITIONS PRIOR TO OCCURRENCE

Plant in OPERATIONAL CONDITION 5 (Refueling)
Reactor at 0% of Rated Power

DESCRIPTION OF OCCURRENCE

On December 12, 1995, while shutdown for refueling, a visual inspection of the reactor core by refueling bridge personnel revealed a fuel bundle that was apparently 180 degrees out of proper orientation. Supervision was immediately notified and the bundle was verified to be misoriented. The misoriented bundle was positioned in a North-East (NE) orientation in lieu of the proper South-West (SW) orientation. A review of core verification video tapes from previous fueling outages confirmed that the bundle was misoriented during the last cycle of operation.

A review of records has revealed that the mispositioning occurred at 0736 hours on Sunday, April 3, 1994. The bundle was picked up in a NE orientation and not rotated to the SW orientation during the fuel move. Core verification, comprising a video monitor review of the core, was performed at that time. As part of the verification, bundle orientation was reviewed by looking at four bundles at a time (a fuel cell) during a continuous scan of the core by the refueling bridge camera.

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ANALYSIS OF OCCURRENCE

Fuel assemblies are arranged in the core according to a design that meets reactivity control requirements and core operating limits. Bundle orientation is an attribute which has an effect on this design. Multiple administrative barriers are in place to decrease the probability of bundle misplacement. Bundle placements are controlled according to procedures "Conduct of Fuel Handling" (NC.NA-AP.ZZ-0049(Q)) and "Refueling Platform and Fuel Grapple Operation" (HC.OP-SO.KE-0001(Q)). These procedures require fuel moves to be independently verified by the refueling floor bridge operator, spotter and refueling Senior Reactor Operator (SRO). A channel fastener (spring clip), located on top of the fuel assembly, acts as a physical aid in ensuring proper bundle orientation. In addition, after all fuel movements are completed, a core verification is performed in accordance with procedure "Verification of Fuel Location" (HC.RE-FR.ZZ-0008(Q)). This procedure specifically requires two scans of the core, one for identification numbers and the other for proper orientation. Additionally, this procedure had incorporated the recommendations of Service Information Letter (SIL) 347 concerning misoriented fuel bundles.

Any one of the above discussed barriers alone should have prevented the event. However, the fuel was misoriented by the refueling bridge operator, not accurately verified by the other bridge operating personnel, and not accurately verified during the independent core verification.

APPARENT CAUSE OF THE OCCURRENCE

The causes for the initial bundle placement and fuel bridge verification errors have been inconclusive. The long time before discovery of the event has hindered the collection of relevant personnel data surrounding the events on the bridge at the time of the error. Although unable to develop a definitive causal factor, a comprehensive corrective action is in place to critically review fuel movement practices.

The procedures for core verification have been reviewed and have been determined to be deficient in detail, scope and level of independent review. Specifically, the procedure was less than adequate in providing sufficient detail for "independent" reviews. Scope of the procedure was less than adequate in that it emphasized serial number checking over orientation and was ambiguous regarding the secondary review being limited to serial numbers. In addition, the procedure had less than adequate consideration for human factors controls in the taping and verification review. Finally, there was an inadequate self verification process for documenting the orientation check and having review aids for the orientation check.

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There were less than adequate human factor controls built into the core verification process. Verifiers document the bundle number; however, for the orientation check they are reviewing the monitor passively and react only if a problem is observed. In addition, the monitor's focus tended to be only on the channel clips. A view of the complete fuel cell would allow the verifier to have multiple indicators to assess proper orientation. A strengthening of these human factors issues will further reduce the probability of a fuel bundle misorientation event.

SAFETY SIGNIFICANCE

This event had no safety significance. The misoriented fuel bundle and the adjacent fuel bundles, operated within fuel design limits during the cycle of concern. A thorough analysis concluded that thermal power, shutdown margin, average linear heat generation rate, minimum critical power ratio and linear heat generation rate were all minimally affected. Technical Specification limits were maintained throughout the cycle.

PREVIOUS OCCURRENCES

There have been no previous reported events involving a fuel bundle being misoriented for a cycle of operation. However, a limited number of fuel bundle seatings and one misorientation have been corrected during the core verification process in the past.

CORRECTIVE ACTIONS

- 1) The procedure for "Verification of Fuel Location", HC.RE-FR.ZZ-0008(Q), was revised prior to the current outages core verification to correct inadequacies concerning detail, scope, and self verification.
- 2) The event was reviewed and self verification was stressed with current fuel handlers and reactor engineers prior to recommencing fuel movement.
- 3) A comprehensive assessment of fuel movement practices will be performed. The assessment will be completed prior to the next refueling outage.