NON-PUBLIC?: N
ACCESSION #: 9504250388
LICENSEE EVENT REPORT (LER)

FACILITY NAME: HOPE CREEK GENERATING STATION PAGE: 1 OF 5

DOCKET NUMBER: 05000354

TITLE: Unplanned Manual Reactor Scram due to the Loss of both
Reactor Recirculation Pumps while in Operational
Condition 1.
EVENT DATE: 03/20/95 LER #: 95-005-00 REPORT DATE: 04/18/95

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Lou Aversa, Senior Staff Engineer -
Technical TELEPHONE: (609) 339-3386

COMPONENT FAILURE DESCRIPTION:
CAUSE: A SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On Monday, March 20, 1995, at approximately 08:45, two Instrument and
Controls technicians were taking voltage readings on an Optical Receiver
Module in a Bailey cabinet located in the lower relay room. As the
performer inserted his leads in the first channel, he noticed he did not
get a valid reading on his hand-held Digital MultiMeter (DMM). As the
technician attempted to adjust the test leads a false breaker trip signal
was generated that resulted in a trip of both Reactor Recirculation Pump
Motor Generator (MG Set) Drive motor breakers. Upon receipt of the
annunciators indicating the Recirculation Pumps had tripped, Control Room
Operators (NCO-RO Licensed) placed the reactor mode switch to shutdown
inputing a manual scram. Corrective actions include: a design change to
eliminate the MG set motor breaker trip which initiated this event,
Maintenance Department is reviewing all events associated with misuse of

M&TE to ensure
essons learned have been adequately addressed,
Maintenance Department is currently reviewing the type of M&TE that is utilized in regard to human factors and checking to ensure that only authorized test equipment is being utilized. Maintenance Supervisors will review their roles and responsibilities regarding pre job briefings, visiting the job site, work standards and use of M&TE.

END OF ABSTRACT

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor (BWR/4)
Reactor Recirculation System BB EIIS Identifier AD
Reactor Protection System SB EIIS Identifier JE
Optic Isolator System n/a

IDENTIFICATION OF OCCURRENCE

TITLE (4): Unplanned Manual Reactor Scram due to the loss of both Reactor Recirculation Pumps while in Operational Condition 1.

Event Occurrence: March 20, 1995
Event Time: 0853

CONDITIONS PRIOR TO OCCURRENCE

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

DESCRIPTION OF OCCURRENCE

On Monday, March 20, 1995, at approximately 08:45, two Instrument and Controls technicians were taking voltage readings on an Optical Receiver Module in a Bailey cabinet located in the lower relay room. As the performer inserted his leads in the first channel, he noticed he did not get a valid reading on his hand-held Digital MultiMeter (DMM). As the technician attempted to adjust the test leads a false breaker trip signal was generated that resulted in a trip of both Reactor Recirculation Pump Motor Generator (MG Set) Drive motor breakers. Upon receipt of the annunciators indicating the Recirculation Pumps had tripped, Control Room Operators (NCO-RO Licensed) placed the reactor mode switch to shutdown inputing a manual scram. The causes of this event were attributed to inadequate work practices, a less than optimum style of test equipment

and less than timely corrective actions for a previously identified design discrepancy.

ANALYSIS OF OCCURRENCE

The Reactor Recirculation System consists of two Reactor Recirculation Pumps that are powered via two Motor Generator Sets (M-G Sets). The MG sets supply power to the Recirculation pump motors through two, in-series circuit breakers (EOC-RPT), that are designed to trip the pump motor and cause a rapid reduction in core flow and reactor power under certain transient conditions. When the EOC-RPT breakers open, a trip signal is sent to the M-G set drive motor breakers. A portion of the system is classified as safety related, while the remaining portion of the system, including the drive motor breakers, is classified as non-safety related. To ensure separation between the safety and non-safety related portion of the system, an optical isolation interface is

ANALYSIS OF OCCURRENCE

provided. A loss of the non safety related portion of the system or the optical isolation would result in a recirc pump trip and is considered fail safe.

The initial plant design and technical specifications permitted full power reactor operation, for a brief time period, with no recirculation pumps in service. During initial startup and early years of operation a dual recirc pump trip did not require placing the mode switch to shutdown. When the potential for reactor core instability was identified in 1989, it was determined that any time no recirculation pumps are in service, during power operation, that the mode switch should be placed to shutdown. Hope Creek incorporated the new philosophy into its operating procedures.

A root cause investigation determined several factors contributed to the occurrence of this event. The investigation began with reviewing the possible effects the test equipment could have on the circuit. The Digital MultiMeter (DMM) can be selected to check for resistance or voltage by the use of a toggle type switch on the side of the DMM. The DMM was first tested with "volts DC" selected. In "voltage" mode no changes occurred in the output of the Optic Isolator Card. The meter was then set to "resistance". In this mode, several groups of outputs for the isolator card would intermittently turn on, one of which is the input to the Recirc MG Set breaker trip. When the resistance scale was ranged on the DMM a higher internal voltage was observed. The higher voltage

output from the DMM, in the resistance mode, would result in a greater frequency of output signals being generated in the isolator card. It was also determined that if the selector switch was depressed slightly while the DMM was selected to volts DC, the DMM would shift to the resistance mode, even though the push button was not fully engaged.

The technician using the DMM to take voltage readings was unaware that partially depressing the selector switch would cause the DMM to switch to resistance. The technician said he may have unintentionally depressed the resistance selector button while attempting to take the voltage readings. A re-enactment with the technician showed that his finger was directly over the resistance selector button when he held the DMM and attempted to take similar voltage readings following the event. Due to the use of test jacks that did not securely fit into the test plugs, the technicians had to jiggle the test leads to obtain readings. It was apparent that while attempting to hold the meter and jiggle the test jacks that a probability of accidently hitting the resistance button existed.

ANALYSIS OF OCCURRENCE

The supervisor in charge of this activity, as well as the technician were also asked if they had known of the potential risks associated with the device being tested. The supervisor and technician were not aware that both MG set drive motor breakers were affected by this one optical isolator card. These voltage readings have been taken on a monthly basis with no similar problems noted in the past.

A review of previous events did reveal one occurrence where a dual recirc pump trip occurred when the entire optic isolator panel was down powered. A procedure was created to bypass the MG set trip circuit when down powering the cabinet, however, the procedure is not referenced during this routine activity.

One additional contributing factor to this event is less than timely implementation of a previously identified corrective action. The first dual recirc pump trip occurred in 1988 from a loss of the optics panel. This event did not result in a manual scram as it occurred prior to the scram requirement identified in 1989. An additional two recirc pump trip and subsequent reactor scram occurred in 1992 due to the loss of common MG set ventilation system which provided a trip signal to both MG set drive motor breakers. As a result of the 1988 event, engineering identified that an invalid signal could result in the loss of both recirc pumps. A design change to remove this trip was approved in 1989 for

implementation in 1991 or later. The design change has been tracked but never implemented. It was proposed for incorporation in Refuel outage 6. The design change was incorporated during this forced shutdown.

APPARENT CAUSE OF OCCURRENCE

The causes of this event were attributed to inadequate work practices,, a less than optimum style of test equipment and less than timely corrective actions for a previously identified design discrepancy.

SAFETY SIGNIFICANCE

This event posed minimal safety significance. All systems functioned as required. A review was performed following the event to determine if any thermal hydraulic instabilities occurred. A review of all available data confirmed that the instability regions were not entered and no indications of unstable operation were noted.

PREVIOUS OCCURRENCES

There has been one previous occurrence of a reactor scram due to a dual recirc pump trip, see LER 92-013-00. There have been several previous reported events regarding misuse of test equipment, see LER's 94-01100, 92-001-00, 89-002-00, 88-036-00, 88-035-00, 88-018-00, 87-010-00, 87-003-00, 86-089-00 and 88-057-00.

CORRECTIVE ACTIONS

The technician has been disciplined in regard to proper work practices.

A design change has been incorporated to eliminate the MG set motor breaker trip which initiated this event.

The Maintenance Department is reviewing all events associated with misuse of M&TE to ensure lessons learned have been adequately addressed.

The Maintenance Department is currently reviewing the type of M&TE that is utilized in regard to human factors.

All M&TE is being inventoried and checked to ensure that only the appropriate authorized test equipment is being utilized.

Maintenance Supervisors will review their roles and responsibilities regarding pre-job briefings, visiting the job site, work standards and

use of M&TE.

Station Management will review the methods used in prioritization of scram reduction design changes.

Sincerely,

R.J. Hovey
General Manager -
Hope Creek Operations

SORC Mtg. 95-025
Recommended approval: Yes

ATTACHMENT TO 9504250388 PAGE 1 OF 1

PSE&G

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

Hope Creek Generating Station

April 18, 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 95-005-00

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

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SORC Mtg. 95-025
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The Energy People

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