



Public Service Electric and Gas Company P.O. Box 235 Hancocks Bridge, New Jersey 08038
Hope Creek Generating Station

December 26, 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 90-021-01

This supplemental Licensee Event Report is being submitted as a followup to the original report for the purposes of expanding the scope of the safety significance evaluation.

Sincerely,

J.J. Hagan
General Manager -
Hope Creek Operations

RBC/

Attachment
SORC Mtg. 90-119

C Distribution

The Energy People

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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 1 OF 6						PAGE (3) 1 OF 6				
TITLE (4): ENVIRONMENTAL QUALIFICATION CONCERNS WITH SOURCE RANGE AND INTERMEDIATE RANGE MONITORS																						
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)					
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OPERATING MODE (9)		1 THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR: (CHECK ONE OR MORE BELOW) (11)																				
		20.402(b)					20.405(c)					50.73(a)(2)(iv)					73.71(b)					
POWER LEVEL		20.405(a)(1)(i)					50.36(c)(1)					50.73(a)(2)(v)					73.71(c)					
1 0 0		20.405(a)(1)(ii)					50.36(c)(2)					50.73(a)(2)(vii)					OTHER (Specify in					
		20.405(a)(1)(iii)					XX 50.73(a)(2)(i)					50.73(a)(2)(viii)(A)					Abstract below					
//////////		20.405(a)(1)(iv)					50.73(a)(2)(ii)					50.73(a)(2)(viii)(B)					and in Text)					
//////////		20.405(a)(1)(v)					50.73(a)(2)(iii)					50.73(a)(2)(x)										
LICENSEE CONTACT FOR THIS LER (12)																						
NAME Richard Cwles, Senior Staff Engineer - Technical												TELEPHONE NUMBER 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	MANUFAC- TURER	REPORTABLE TO NPRDS?	CAUSE	SYSTEM	COMPONENT	MANUFAC- TURER	REPORTABLE TO NPRDS?													
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SUPPLEMENTAL REPORT EXPECTED? (14) YES NO										DATE EXPECTED (15)												
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ABSTRACT (16)

On 10/3/90, during engineering discussions regarding a potential design enhancement on the Source Range and Intermediate Range monitors (SRMs and IRMs), it was determined that an unknown number of SRM and IRM detector electrical connectors were replaced, during maintenance activities, with connectors containing a bushing of a non-EQ material type (Teflon). The connector bushing type specified in the station EQ program is comprised of Rexolite material. In subsequent consultations with the equipment vendor (General Electric) on 10/5/90, PSE&G was informed that SRM/IRM connector bushings comprised of Teflon material have not been analyzed as meeting the requirements of Hope Creek's EQ program, as such, the SRMs and IRMs were declared inoperable. Note that SRMs/IRMs are only required to be operable in Operational Condition 2,3,4, and 5. On 10/12/90 at 1500, after extensive senior management discussions, safety evaluations, and a briefing of the NRC Resident Inspector, a decision was made to conservatively initiate a 24 hour NRC notification in accordance with facility License Condition 2.F as a non-compliance with 10CFR50.49 (EQ rule). Two primary factors contributed to this event: conflicting vendor documentation regarding the correct connector, and procedural adherence. Corrective actions included preparation of a Justification for Continued Operation in Operational Condition 1, scheduling changeout of all SRM/IRM at the first available opportunity, reviewing this incident with all controls technicians and supervisors, and reviewing/updating documentation associated with the connectors, where necessary.

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PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor (BWR/4)
Neutron Monitoring System (EIIIS Designation: IG)

IDENTIFICATION OF OCCURRENCE

Environmental Qualification Concerns with Source Range and Intermediate Range Monitors

Event Date: 10/3/90

Reportability Date: 10/12/90

This LER was initiated by Incident Report Nos. 90-132 & 90-135

CONDITIONS PRIOR TO OCCURRENCE

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

DESCRIPTION OF OCCURRENCE

On 10/12/90 at 1500, the Licensing Depa ment determined that a potentially non-conforming environmental qualification (EQ) condition on the Source Range and Intermediate Range monitors (SRMs and IRMs) was reportable to the NRC as a non-compliance with 10CFR50.49. After communicating this determination to the Senior Nuclear Shift Supervisor (SNSS, SRO licensed), a 24 hour NRC notification was made at 1600 in accordance with Hope Creek Facility Operating License Condition 2.F. No other action was taken by the SNSS, as the SRMs and IRMs were already inoperable at the time this decision was reached.

ANALYSIS OF OCCURRENCE

On 10/3/90, a Maintenance Supervisor (Controls), the Technical Engineer - I&C, and the Station EQ Engineer were discussing a potential design enhancement to the SRMs and IRMs. During the course of this discussion, it was determined that an unknown number of SRM and IRM detector electrical connectors were replaced, during past maintenance activities, with connectors (refer to Attachment 1) containing a bushing of a non-EQ material type (Teflon). Station management was informed of this determination, and direction was given to consult with the Nuclear Engineering department and the SRM/IRM vendor (General Electric) to analyze the acceptability of the connector Teflon bushings from an EQ standpoint.

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ANALYSIS OF OCCURRENCE, CONT'D

On 10/5/90, following design basis research by GE, PSE&G was informed that SRM/IRM connector bushings comprised of Teflon material had not been analyzed as meeting the requirements of Hope Creek's EQ program. Systems Engineering informed the Operations Engineer of these findings, and at 2025, the SRMs and IRMs were declared inoperable. It should be noted that SRMs and IRMs are not required, by Technical Specifications, to be operable in Operational Condition 1 (Power Operation).

Although the SRMs and IRMs were not required to be operable, station management directed that a Justification for Continued Operation (JCO) be prepared, and as part of the JCO, that a safety evaluation be conducted. On 10/12/90, a JCO was presented to the Station Operating Review Committee (SORC), and was approved. During the SORC meeting, the NRC Resident Inspector was briefed on the status of the SRMs/IRMs. Subsequent to SORC approval of the JCO, at 1500, the Licensing Department concluded that the station should initiate NRC notification as previously described.

Concurrent with preparation of the above referenced JCO, an investigation of the factors leading to the SRMs/IRMs being out of EQ configuration was initiated. Additionally, the need to quantify the number of SRM/IRM connectors outside of EQ configuration was recognized. On 11/4/90, the station entered a forced outage. As of the date of this report, all SRM/IRM detector connectors have been inspected, and non-EQ connectors have been replaced. Inspection concluded that out of all 12 detectors, 6 were found with non-EQ connectors (2 SRMs and 4 IRMs). A review of maintenance records indicated that the earliest possible date that a connector was replaced with non-EQ material was 3/21/86 (connector for "B" SRM).

APPARENT CAUSE OF OCCURRENCE

Two primary factors contributed to this event. Conflicting vendor documentation led the controls group to believe that that either of two connector part numbers were acceptable. On this basis, when the PSE&G bill of material (BOM) for the SRMs/IRMs was developed, the part number for the non-EQ connector was entered into the BOM. The original computerized BOM was based on approved vendor documentation during initial startup of the plant. The BOM was not updated as a result of a late material change performed by GE, and contained the non-EQ connector.

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APPARENT CAUSE OF OCCURRENCE, CONT'D

A procedure for changing out these connectors was developed in 1988 to clarify connector usage. The correct part number for the EQ connector was referenced in this procedure. However, the discrepancy between the procedure and BOM was not resolved. As a result, the controls supervisor responsible for SRM/IRM detector maintenance erroneously assumed that either connector was still technically acceptable for this application and took it upon himself to make this substitution without requesting a procedure revision or further guidance. This error was carried over to one connector replacement subsequent to procedure development.

PREVIOUS OCCURRENCES

A similar incident occurred in 1989 when inadequate review of documentation resulted in a maintenance department supervisor choosing an incorrect replacement part (reference: LER 89-008). The supervisor received counselling, and the incident was reviewed with all maintenance department supervisors.

SAFETY SIGNIFICANCE

The connectors are qualified by the EQ Program for the following conditions:

- SRMs - Reg Guide 1.97 Post Accident Monitoring during small break LOCA atmosphere
- IRMs - Scram function to protect against a control rod drop accident or rod withdraw error in normal operating environment and Reg Guide 1.97 Post Accident Monitoring function in Anticipated Transient Without Scram (ATWS) event (normal operating environment) and in small break LOCA atmosphere.

As previously noted, the SRMs and IRMs are not required to be operable in Operational Condition 1. An assessment of impact on plant operation in various operating scenarios was conducted as part of the JCO, and determined that redundant means of fulfilling post-accident monitoring requirements were available. This assessment concluded that the inoperability of the SRMs and/or IRMs would not increase the risk to health and safety of the public, and would not increase the probability or consequences of analyzed accident scenarios. This analysis assumed that all IRMs and SRMs were in a non-EQ configuration; when the detectors were in service, 1 SRM and 3 IRMs were determined to have been available for post accident monitoring, if required.

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SAFETY SIGNIFICANCE, CONT'D

Additionally, a review was conducted to determine if the inoperability of the SRMs and IRMs would have had any detrimental effects from the time of the first installation of a non-EQ connector (March, 1986). During previous plant startups and refueling activities where the SRMs and IRMs were required to be operable, less than the Technical specification required number of channels had the proper EQ configuration. However, the following considerations lead to the conclusion that the as-found configuration had minimal safety significance:

1. PSE&G's Engineering Sciences Group has performed a materials evaluation of the teflon connectors and found that potential degradation of the teflon insulating material due to irradiation during the past five years of normal operation would result in no significant effects on insulation resistance or mechanical properties. This is consistent with the fact that GE has utilized the teflon type connector in previous designs where qualification for Reg Guide 1.97 post accident conditions was not required. Thus, it is concluded that the teflon connectors would have performed their required functions during previous plant startups and would have been adequate for post accident ATWS conditions.
2. As previously noted, 2 SRMs and 4 IRMs were verified to have EQ connectors. The design of SRM and IRM controls allows only 1 SRM and 2 IRMs to be bypassed at any one time. Therefore, in any given operating scenario, at least one qualified SRM and two qualified IRMs would have been available to meet Reg Guide 1.97 post-accident reactivity monitoring requirements.

Additional supporting information for this summary analysis of safety significance has been forwarded to the NRC Region I Administrator.

CORRECTIVE ACTIONS

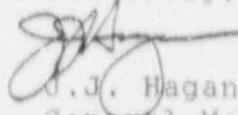
1. The Operations Engineer briefed all licensed operating personnel on the inoperability of the SRMs and IRMs, and directed all licensed personnel to immediately shutdown the reactor (manual scram) in the event an operating scenario (ie. power reduction to less than 4% reactor power) arose that would have required use of the SRMs or IRMs.

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CORRECTIVE ACTIONS, CONT'D

2. Workorders were initiated to inspect all SRM/IRM connectors, and completion of these workorders were scheduled for the first forced or scheduled outage. On 11/4/90, Hope Creek entered a forced outage, and the connectors have been restored to proper EQ status.
3. All conflicting documentation associated with the SRM/IRM connectors will be identified to the Manager, Nuclear Engineering and Design for resolution of discrepancies.
4. The controls supervisor responsible for maintenance of the SRM/IRM detectors has been counselled, stressing the need for early identification and resolution of engineering discrepancies and the need for strict adherence to procedures.
5. The Maintenance Manager will review this incident with all maintenance department supervisors, and communicate his expectations with regards to identification and resolution of problems such as noted in this report.
6. An independent investigation will be conducted to verify causes and ensure adequacy of corrective actions.

Sincerely,



J.J. Hagan
General Manager -
Hope Creek Operations

RBC/

SORC Mtg. 90-119

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ATTACHMENT 1
SRM/IRM DETECTOR ASSEMBLY

