

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)  
Hope Creek Generating Station

DOCKET NUMBER (2)  
0 5 0 0 0 3 5 4

PAGE (3)  
1 OF 0 5

TITLE (4)  
B Channel Engineered Safety Features Actuation

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 NAMES	DOCKET NUMBER(S)															
0	4	2	0	8	6	8	6	-	0	0	7	-	0	0	0	5	1	9	8	6	0	5	0	0	0
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THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §. (Check one or more of the following) (11)

OPERATING MODE (8) 5	20.402(b)	20.406(e)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10) 0 0 1 0	20.406(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
	20.406(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.406(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
	20.406(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
	20.406(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME  
W. J. Merritt

TELEPHONE NUMBER  
AREA CODE  
6 0 9 3 3 9 - 3 0 6 4

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)  NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

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

At 0107 on April 20, 1986, a B Channel Engineered Safety Feature (ESF) actuation occurred as a result of a spurious reactor low level signal. All equipment actuations occurred as expected. Believing the problem to be a B RPS MG set electrical malfunction, operators transferred the B RPS Bus power supply to the alternate power supply. Shortly after the transfer, the alternate power electrical protective assembly (EPA) tripped on undervoltage causing a loss of power to B RPS Bus. Since the "shorting links" were removed at the time, a power failure on the B RPS Bus resulted in the generation of a scram signal. The low level signal on the B channel is being attributed to a pressure transient on the common reference leg for the transmitters. However, the cause of the transient is unknown. Regardless, engineering personnel will investigate methods of reducing the probability of producing pressure transients during testing. The subsequent scram on loss of power to the 3 RPS Bus is attributed to a design inadequacy regarding the setting of the EPA undervoltage trip. Corrective action will be to set the trip with a short time delay.

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					0   2	OF 0   5

TEXT (If more space is required, use additional NRC Form 388A's) (17)

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor  
 Reactor Protection System (EIIS Designation: JC)  
 Redundant Reactivity Control System (No EIIS Designation)  
 Nuclear Boiler Instrumentation (EIIS Designation: JE)

IDENTIFICATION OF OCCURRENCE

B Channel Engineered Safety Feature Actuation  
 Event Date: 04/20/86  
 Event Time: 0107

CONDITIONS PRIOR TO OCCURRENCE

Plant in OPERATIONAL CONDITION 5 and performing initial core load and control rod friction testing. All emergency core cooling systems (ECCS) administratively removed from service (i.e. tagged out) in support of core load. Various surveillance tests in progress in preparation for initial criticality.

DESCRIPTION OF OCCURRENCE

At 0107 on April 20, 1986, a B Channel Engineered Safety Features (ESF) actuation occurred on an apparent spurious Reactor Water Level 1 and Level 2 signals. The major equipment and systems which actuated or received actuation signals are as follows:

- o B Emergency Core Cooling Systems
- o B Emergency Diesel Generator
- o B Service Water Pump
- o B Safety Auxiliaries Cooling Pump
- o B and F Filtration, Recirculation, and Ventilation (FRVS) Recirculation Units
- o B FRVS Vent Unit
- o Division 2 Redundant Reactivity Control System (ARI, Recirc Pump trip)
- o Primary Containment Isolation System - Channel B

All ECCS pumps were tagged out at the time of the incident in support of initial fuel loading activities and thus did not start. Also, no control rods were withdrawn at the time of the occurrence. Thus, while the Alternate Rod Insertion (ARI) valve actuation depressurized the scram air header, no rod insertion resulted. All other actuations occurred as expected.

Upon investigating the initial event, operators noticed that a number of B Channel level instruments were tripped.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

DESCRIPTION OF OCCURRENCE (CON't)

Believing the problem to be a B RPS MG set electrical malfunction, the operators transferred the B RPS Bus power supply from the MG set to the alternate power supply. Shortly after the transfer, the alternate power supply electrical protective assembly (EPA) tripped on undervoltage causing a loss of power to the B RPS Bus. At the time of the event the "Shorting links" were removed in support of core load as required by Technical Specification 3/4.9.2, INSTRUMENTATION. Thus the power failure on the B RPS Bus resulted in a full scram signal.

APPARENT CAUSE OF OCCURRENCE

The B Channel actuation is being attributed to a pressure transient on the common reference leg for the instrumentation. The root cause of this pressure transient however, is unknown. The root cause of the subsequent scram signal following the EPS trip is a design inadequacy regarding the setting of the EPS undervoltage trip.

ANALYSIS OF OCCURRENCE

All of the instruments which generated the spurious Level 1 and Level 2 signals share a common reference leg. In addition, no other signals were received at the onset of the event from instruments not tied to this common reference leg. Plant personnel investigating the incident considered a number of different causes for the generation of the spurious level signals. Due to the hydraulic link (i.e. common reference leg) between the instruments generating the actuation signals the most credible cause is considered to be a pressure transient on the common reference leg. Such a transient could be induced by improperly valving a transmitter into service on the reference leg. A review of work orders and the I&C log was made to determine if any testing was underway at the time of the event which could have caused a pressure transient. This review revealed no such evolutions were in progress. I&C technicians and supervisors were interviewed to determine if any work which could have caused the actuation was underway at the time of the event. The personnel indicated that to the best of their knowledge, no such work was in progress. As an alternative, plant personnel investigating the incident-considered the unauthorized opening of an equalizing valve as a probable cause since such an act would leave no evidence of tampering. However, at the time of the incident the reactor cavity was flooded and thus the opening of an equalizing valve would have no effect on either the reference or variable leg.

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TEXT (if more space is required, use additional NRC Form 366A's) (17)

ANALYSIS OF OCCURRENCE (CON't)

As a non-hydraulic cause, plant personnel investigated the possibility of a common electrical power supply failure. However, it was determined that some of the instruments generating the signals were not fed off the same electrical supply. Thus, an electrical malfunction was discounted.

While no concrete evidence exists, a pressure transient is considered the most credible cause based on the hydraulic link, type and source of actuation signals received, and the indication of a pressure spike on a level/pressure recorder connected to the subject reference leg. The cause of the pressure transient, however, is unknown.

An investigation into the subsequent scram following the EPA trip revealed that approximately one second prior to the scram signal initiation, a Turbine Building Chilled Water System Chiller loaded on 4.16KV Bus 10A101. The chiller load (1308 kw) is sufficient to momentarily reduce the 4.16 KV bus voltage. This bus provides the alternate power supply to the B RPS Bus via a unit substation (10B130) and Motor Control Center (10B131). A momentary degradation of voltage on Bus 10A101 results in momentary degraded voltage condition on the RPS Bus. Since the RPS alternate power supply EPA undervoltage trip is set with no time delay, a momentary voltage drop below 108VAC (EPA undervoltage setpoint) results in an EPA trip.

The public health and safety was not compromised by the initial ESF actuation or subsequent scram. This LER is being submitted pursuant to 10CFR50.73(a)(2)(iv).

CORRECTIVE ACTION

While it felt that the B Channel ESF actuation can be attributed to pressure transient on the common reference leg, the exact cause of the transient is unknown. Regardless, plant system engineering personnel are reviewing the instrument setup on the reference leg to determine if procedural or design changes can be implemented which would lessen the probability of inducing a transient during testing.

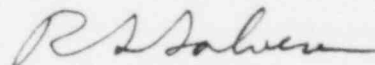
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

A design change will be implemented on the RPS Bus EPAs to set the undervoltage relays with a short time delay. This time delay will preclude EPA trips on momentary bus undervoltages but will assure the protection of the bus in sustained degraded voltage conditions.

Sincerely,



R. S. Salvesen  
 General Manager  
 Hope Creek Generating Station

WJM:bar

SORC Mtg. 86-113



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

Hope Creek Generating Station

May 19, 1986

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 86-007

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

Sincerely yours,

A handwritten signature in dark ink, appearing to read "R. S. Salvesen", written over a horizontal line.

R. S. Salvesen  
General Manager  
Hope Creek Operations

KMH:bar

SORC Mtg. 86-113  
Attachment

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