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U. S. Nuclear Regulatory Commission
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Washington, DC 20555

LER 354/04-004-00
HOPE CREEK GENERATING STATION
FACILITY OPERATING LICENSE NO. NPF-57
DOCKET NO. 50-354

This Licensee Event Report entitled "Non-Conservative 4160 Volt Class 1E Bus Operating Limits" is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(v)(D).

Sincerely,

James Hutton
Plant Manager – Hope Creek

Attachment

BJT

C Distribution
LER File 3.7

IE22

NRC FORM 366 (7-2001) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 7-31-2004

Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Hope Creek Generating Station	05000354	1 OF 5

4. TITLE

Non-Conservative 4160 Volt Class 1E Bus Operating Limits

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
04	05	2004	2004	– 004	– 00	06	03	2004	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE	4
10. POWER LEVEL	0

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)
20.2201(d)	20.2203(a)(4)	50.73(a)(2)(iii)	50.73(a)(2)(x)
20.2203(a)(1)	50.36(c)(1)(i)(A)	50.73(a)(2)(iv)(A)	73.71(a)(4)
20.2203(a)(2)(i)	50.36(c)(1)(ii)(A)	50.73(a)(2)(v)(A)	73.71(a)(5)
20.2203(a)(2)(ii)	50.36(c)(2)	50.73(a)(2)(v)(B)	OTHER Specify in Abstract below or in NRC Form 366A
20.2203(a)(2)(iii)	50.46(a)(3)(ii)	50.73(a)(2)(v)(C)	
20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)	X 50.73(a)(2)(v)(D)	
20.2203(a)(2)(v)	50.73(a)(2)(i)(B)	50.73(a)(2)(vii)	
20.2203(a)(2)(vi)	50.73(a)(2)(i)(C)	50.73(a)(2)(viii)(A)	
20.2203(a)(3)(i)	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(B)	

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER (Include Area Code)
Brian Thomas, Licensing Engineer	856-339-2022

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED			15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO				

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

On April 5, 2004, a review of electrical design calculations identified that Operations procedures contained non-conservative values for minimum voltage on the Class 1E 4160 volt buses. The design calculations demonstrate that if voltage on the Class 1E 4160 volt buses are maintained above the minimum analyzed bus voltage level in the calculations, the 4160 volt buses would provide sufficient voltage to start and maintain the running loads without separating from the offsite power source. These calculations were performed to demonstrate compliance with 10CFR50 Appendix A General Design Criteria 17, "Electric Power Systems," and Branch Technical Position PSB-1, "Adequacy of Station Electric Distribution System Voltages." Operating logs and procedures used to monitor the 4160 volt Class 1E buses would have allowed the buses to operate below the minimum voltage analyzed in the calculations. In addition to the non-conservative minimum bus voltage in the operating logs, the review of the calculations also identified that the automatic load tap changer (LTC) was set to maintain voltage at a "nominal 4200 volts minimum". At a setpoint of 4200 volts, the LTC was not capable of maintaining the minimum bus voltage assumed in the calculations when setpoint inaccuracies are taken into account.

The cause of this event is attributed to inadequate program detail that resulted in an inadequate program to program interface between design calculations and implementing procedures. An Operability Determination was generated to establish the required minimum bus voltage, including instrument inaccuracies, and to operate the load tap changers manually to maintain the buses above the new limit. Additionally, Operating procedures were revised to reflect the new voltage limits and administrative procedures will be revised to address the interface between design calculations and implementing procedures.

This event is being reported in accordance with 10CFR50.73(a)(2)(v)(D), any event that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Hope Creek Generating Station	05000354	2004	004	00	2 OF 5

NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

PLANT AND SYSTEM IDENTIFICATION

General Electric – Boiling Water Reactor (BWR/4)

4160 Volt Class 1E Bus – EIIS Identifier {BI}*

* Energy Industry Identification System {EIIS} codes and component function identifier codes appear as {SS/CCC}

IDENTIFICATION OF OCCURRENCE

Event Date: April 5, 2004
Discovery Date: April 5, 2004

CONDITIONS PRIOR TO OCCURRENCE

The plant was in OPERATIONAL CONDITION 4, cold shutdown, at the time of the event. There was no equipment out of service at the time of this event that contributed to the event.

DESCRIPTION OF OCCURRENCE

On April 5, 2004, a review of electrical design calculations identified that Operations procedures contained non-conservative values for minimum voltage on the Class 1E 4160 volt buses {BI}. The design calculations demonstrate that if voltage on the Class 1E 4160 volt buses are maintained above the minimum analyzed bus voltage level in the calculations, the 4160 volt buses would provide sufficient voltage to start and maintain the running loads without separating from the offsite power source. These calculations were performed to demonstrate compliance with 10CFR50 Appendix A General Design Criteria 17, "Electric Power Systems," and Branch Technical Position PSB-1, "Adequacy of Station Electric Distribution System Voltages." Operating logs and procedures used to monitor the 4160 volt Class 1E buses would have allowed the buses to operate below the minimum voltage analyzed in the calculations. In addition to the non-conservative minimum bus voltage in the operating logs, the review of the calculations also identified that the automatic load tap changer (LTC) was set to maintain voltage at a "nominal 4200 volts minimum". This led to non-conservative implementation in that it refers to 4200 volts as both a nominal and minimum value. At a setpoint of 4200 volts, the LTC was not capable of maintaining the minimum bus voltage assumed in the calculations when setpoint inaccuracies are taken into account. The design calculations assumed that the LTC would automatically maintain the bus voltage above 4200 volts.

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
HOPE CREEK GENERATING STATION	05000354	2004	004	00	3 OF 5

NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* (17)

DESCRIPTION OF OCCURRENCE (cont'd)

At the time this issue was identified, Hope Creek was in Operational Condition 4 (Cold Shutdown). On April 5, 2004, at 2030 hours, all four Class 1E 4160 volt buses were declared inoperable. Engineering evaluation H-1-PB-EEE-1832 was developed to determine the actual upper and lower operating voltage limits for the 4160 volt buses. This engineering evaluation determined the minimum voltage required by the design calculations taking into account the total loop accuracy of the instrumentation used by the Operators to monitor bus voltage. Based on this engineering evaluation, an Operability Determination was developed in accordance with Generic Letter 91-18. Since the automatic LTCs are not capable of maintaining the bus voltages above the minimum value specified in the engineering evaluation at their current setpoint, the LTCs were placed in manual and the frequency for monitoring bus voltage was increased from once every 12 hours to once every 2 hours. Operating procedures were revised to include the new frequency for monitoring the bus voltage with the LTC in manual and the new voltage limits specified in the engineering evaluation. Class 1E 4160 bus voltages were manually adjusted to meet the requirements of the revised Operating procedures. At 1159 hours, on April 8, 2004, the Class 1E 4160 volt buses were declared operable.

The above event is being reported in accordance with 10CFR50.73(a)(2)(v)(D), any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident.

CAUSE OF OCCURRENCE

The cause of this event is attributed to inadequate program detail that resulted in an inadequate program to program interface between design calculations and implementing procedures. Electrical design calculations were revised without identifying the impact to implementing procedures and implementing procedures were revised without the knowledge that the values being changed were directly related to input assumptions in design calculations.

A contributing cause of this event was less than adequate corrective actions associated with the response to a Notice of Violation 94-18 for Salem and Hope Creek. This violation identified that 125V battery service test procedures did not incorporate the acceptance limits contained in applicable design calculations. One of the corrective actions was to revise procedure NC.DE-AP.ZZ-0002, "Engineering Calculations and Analyses," to establish controls to ensure that procedural impacts are identified when calculations are revised/developed. This corrective action was determined to be ineffective as a result of this event.

PREVIOUS OCCURRENCES

A review of LERs at Salem and Hope Creek generating stations for the previous two years did not identify any similar reportable events related to engineering calculation and procedure interfaces.

SAFETY CONSEQUENCES AND IMPLICATIONS

There was no impact to the health and safety of the public. Hope Creek was in Operational Condition 4 (Cold Shutdown) when the non-conservative 4160 volt bus limits were identified. An engineering evaluation was performed which established the appropriate minimum Class 1E bus voltages, an operability determination was developed in accordance with Generic Letter 91-18, Operating logs were revised to reflect the new limits, the automatic load tap changer was placed in manual (since the setpoint could not maintain bus voltage above the established lower limit) and the bus voltages were manually adjusted to be above the required minimum bus voltage prior to the plant transitioning to Operational Condition 2 (Startup).

In the event that the Class 1E bus voltages were operating below the analyzed limits in the calculations in the past, the potential existed that during a Loss of Coolant Accident (LOCA), the Class 1E buses may have separated from the offsite power source in the midst of load sequencing and then be re-sequenced on to the diesel generator. Although this potential existed, no event has occurred at Hope Creek that required the LOCA loading of all of the Class 1E 4160 volt buses at once.

A review of this event has determined that a Safety System Functional Failure (SSFF) has occurred as defined in Nuclear Energy Institute (NEI) 99-02.

CORRECTIVE ACTIONS:

1. The plant remained in Operational Condition 4 until an operability determination was generated in accordance with Generic Letter 91-18 to allow for plant restart.
2. Engineering evaluation H-1-PB-EEE-1832 was issued to determine the required Class 1E 4160 volt bus voltage limits including the inaccuracies of the indications used by the Operating Shift to monitor bus voltages.
3. The load tap changers for the Class 1E 4160 volt buses were placed in manual and appropriate Operating procedures were revised to reflect the manual operation of the load tap changers associated with the Class 1E 4160 buses and to incorporate the voltage limits specified in engineering evaluation H-1-PB-EEE-1832.
4. The design calculation for the setting of the automatic load tap changer will be revised to establish a new setpoint for automatic operation.

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
HOPE CREEK GENERATING STATION	05000354	2004	004	00	5 OF 5

NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

CORRECTIVE ACTIONS(cont'd):

5. Procedure NC.DE-AP.ZZ-0002, "Engineering Calculations and Analyses," will be revised to include a requirement that calculations contain an implementing procedure cross reference section.
6. Procedures NC.DM-AP.ZZ-0001, "Procedure Administrative Process," and NC.NA-WG.ZZ-0001, "Procedures Writers Guide," will be revised to instruct procedure writers to contact Engineering when values are being changed in procedures that are associated with setpoints or operating bands.

The actions specified above are being tracked in accordance with PSEG Nuclear's Corrective Action Program.

COMMITMENTS

The corrective actions cited in this LER are voluntary enhancements and do not constitute commitments.