ENERGY NORTHWEST

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GO2-11-172

10 CFR 50.73

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397**
LICENSEE EVENT REPORT NO. 2011-002-00

Dear Sir or Madam:

Transmitted herewith is Licensee Event Report No. 2011-002-00 for Columbia Generating Station. This report is submitted pursuant to 10 CFR 50.73(a)(2)(v)(B) and 10 CFR 50.73(a)(2)(iv)(A). The enclosed report discusses items of reportability and corrective actions taken related to a loss of shutdown cooling event associated with a logic card failure that occurred on August 27, 2011.

There are no commitments being made to the NRC herein. If you have any questions or require additional information, please contact Mr. ZK Dunham at (509) 377-4735.

Respectfully,
Bruce Maughan
acting for Brad Sawatzke

BJ Sawatzke
Vice President, Nuclear Generation & Chief Nuclear Officer

Enclosure: Licensee Event Report 2011-002-00

cc: NRC Region IV Administrator
NRC NRR Project Manager
NRC Senior Resident Inspector/988C
RN Sherman – BPA/1399
WA Horin – Winston & Strawn

IE22
NRR

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION
(10-2010)

APPROVED BY OMB NO. 3150-0104 EXPIRES 10/31/2013

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@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 an 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
Columbia Generating Station	05000397	1 OF 3

4. TITLE

Loss of Shutdown Cooling due to Logic Card Failure

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER 05000
08	27	2011	2011	– 002 –	00	10	25	2011	FACILITY NAME	DOCKET NUMBER 05000

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

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER *(Include Area Code)*
Richard M Garcia, Senior Licensing Engineer	509-377-8463

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
X	JC	ECBD	G080	Y					

14. SUPPLEMENTAL REPORT EXPECTED

☐ **YES** *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ **NO**

15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR

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

At 2021 hours on August 27, 2011, a loss of shutdown cooling occurred due to a spurious undervoltage signal in one of two, in series, Electrical Protection Assembly (EPA) circuit breaker supplying the B train of the Reactor Protection System (RPS) power bus (RPS-B). Response to the spurious signal resulted in loss of power to RPS-B and associated actuations including isolation of the common shutdown cooling suction valves. The spurious signal originated in a logic board (GE Model 147D8652G007) associated with the EPA Breaker. Post event testing was unable to specifically identify the discrete component responsible for the failure. The root cause was that Energy Northwest was not proactive in replacing older, obsolete model boards (including the one that caused the event) with a new model recommended by the vendor. The faulty logic board and the other logic board in series for RPS-B were replaced with newer model boards. Further corrective actions will replace the remaining logic boards currently installed in the plant with the newer models. This event is being reported under 10 CFR 50.73(a)(2)(v) as an event that could have prevented fulfillment of a safety function, as well as an invalid actuation of containment isolation in multiple systems per 10 CFR 50.73(a)(2)(iv).

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Plant Conditions

At the time of the event, the plant was in Mode 4 and 144 days into refueling outage 20 (R-20). Shutdown cooling was provided by Loop B of the shutdown cooling (SDC) [BO] system. Reactor temperature was approximately 107 degrees Fahrenheit and RPV Level was in the 80 – 100 inch range as indicated on shutdown range instrumentation. There was no equipment that was inoperable at the time of the event which contributed to the event.

Event Description

At 2021 hours on August 27, 2011, the Reactor Protection System (RPS) electrical power system bus "B" (RPS-B) [EC] was lost resulting in isolation of the active loop of shutdown cooling . Field survey noted that both Electrical Protection Assembly (EPA) circuit breakers [52] providing normal power supply for RPS-B were in the trip free position. The upstream EPA breaker (RPS-EPA-3B) had undervoltage and power in lights illuminated. No indicating lights were present on the downstream breaker (RPS-EPA-3D). Immediately following the event, the motor generator [MG] set supplying RPS-B was noted to be running at 120 V with approximately 0 amps indicated current. Loss of RPS-B results in isolation of primary containment isolation valves in multiple systems including closing the common shutdown cooling suction line rendering both shutdown cooling loops inoperable. Due to both shutdown cooling loops being inoperable, Technical Specification Action Statement 3.4.10.A was entered.

All expected isolations were validated to have occurred due to the loss of RPS-B, including isolation of containment isolation valves in Groups 2, 4, 6, & 7 including the residual heat removal, reactor water cleanup [CE], reactor recirculation [AD], radiological drain [WK], control rod drive [AA] and traversing incore probe [IG] systems. Immediate investigations confirmed that the loss of RPS-B was not caused by ongoing work, or by manual action directly on the circuit breaker. This event is reportable as an event that could have prevented fulfillment of a safety function needed to remove residual heat in accordance with 10 CFR 50.73(a)(2)(v)(B), as well as an invalid system actuation resulting in containment isolation in more than one system. A 10 CFR 50.72(b)(3)(v)(B) notification was made via Event Number 47209.

Immediate Corrective Actions

RPS-B was repowered from the alternate power supply, the valve isolations were reset per plant procedures, and the technical specification action statement was exited.

Following the event, a faulted logic board (GE Model 147D8652G007) [ECBD] was replaced with a vendor recommended newer replacement model. The logic board on the other in-line EPA circuit breaker for RPS-B normal power supply was also replaced with a newer model board.

Assessment of Safety Consequences

The total time without shutdown cooling was 34 minutes and the reactor coolant system (RCS) temperature rose approximately 4 degrees Fahrenheit. The calculated time to reach 200 degrees Fahrenheit was approximately 11 hours. An extended loss of shutdown cooling could have led to excessive fuel temperatures

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and ultimately fuel damage. However, the actual significance was limited due to the short duration of the SDC outage and minimal temperature rise with substantial margin to 200 degrees.

If the event had occurred earlier in the refueling outage shortly after shutdown, the significance would have been greater since the time to 200 degrees F is much shorter and could have resulted in an unintended and unplanned MODE change from MODE 4 to MODE 3.

Had the logic card failure occurred in Modes 1 or 2, the same isolations and actuations would occur but would not be expected to result in a plant trip. The resulting isolations would require operator intervention to mitigate, but all response actions are covered by existing station procedures.

Cause of Event

The reason for the loss of RPS-B was due to a spurious undervoltage trip signal from a logic board which is part of the EPA circuit breaker for RPS-B. The spurious undervoltage signal was caused by a logic board fault, which has been identified as the direct cause of the event. The root cause is that Energy Northwest was not proactive in replacing older, obsolete logic boards with new models recommended by the vendor.

Similar Events

No previous occurrences involving a logic board failure leading to an EPA breaker trip have been identified at Columbia.

Further Corrective Actions

At the time of the event, a total of six of the GE Model 147D8652G007 logic boards were installed in the plant. Two were replaced as part of the immediate corrective actions and the remaining four will be replaced as part of the corrective actions to prevent recurrence. Analysis of the logic board by the vendor was inconclusive.

Energy Industry Identification System (EIIS) Information codes from IEEE Standards 805-1984 and 803-1983 are represented in brackets as [XX], [XXX] and [XXXX] throughout the body of the narrative.