



ENERGY NORTHWEST

Sudesh K. Gambhir
Vice President, Technical Services
P.O. Box 968, Mail Drop PE04
Richland, WA 99352-0968
Ph. 509-377-8313 F. 509-377-2354
sgambhir@energy-northwest.com

July 6, 2009
GO2-09-095

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. 2009-002-00**

Dear Sir or Madam:

Transmitted herewith is Licensee Event Report No. 2009-002-00 for Columbia Generating Station. This report is submitted pursuant to 10 CFR 50.73(a)(2)(iv)(A). The enclosed report discusses items of reportability and corrective actions taken related to a manual reactor scram that occurred on May 8, 2009.

There are no commitments being made to the NRC herein. If you have any questions or require additional information, please contact Mr. MC Humphreys at (509) 377-4025.

Respectfully,

SK Gambhir
Vice President, Technical Services

Enclosure: Licensee Event Report 2009-002-00

cc: EE Collins, Jr. – NRC RIV
NJ DiFrancesco – NRC NRR
INPO Records Center
NRC Sr. Resident Inspector – 988C (2)
RN Sherman – BPA/1399
WA Horin – Winston & Strawn
WC Walker – NRC RIV/fax

TE22
NRR

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION (9-2007)		APPROVED BY OMB NO. 3150-0104 EXPIRES 08/31/2010 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 Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@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 Columbia Generating Station		2. DOCKET NUMBER 05000397	3. PAGE 1 OF 3																																				
4. TITLE Manual Reactor Scram due to Loss of Hydrogen Pressure in the Main Generator																																							
5. EVENT DATE <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 33%;">MONTH</th> <th style="width: 33%;">DAY</th> <th style="width: 33%;">YEAR</th> </tr> <tr> <td style="text-align: center;">05</td> <td style="text-align: center;">08</td> <td style="text-align: center;">2009</td> </tr> </table>		MONTH	DAY	YEAR	05	08	2009	6. LER NUMBER <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 33%;">YEAR</th> <th style="width: 33%;">SEQUENTIAL NUMBER</th> <th style="width: 33%;">REV NO.</th> </tr> <tr> <td colspan="3" style="text-align: center;">2009 - 002 - 00</td> </tr> </table>		YEAR	SEQUENTIAL NUMBER	REV NO.	2009 - 002 - 00																										
MONTH	DAY	YEAR																																					
05	08	2009																																					
YEAR	SEQUENTIAL NUMBER	REV NO.																																					
2009 - 002 - 00																																							
		7. REPORT DATE <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 33%;">MONTH</th> <th style="width: 33%;">DAY</th> <th style="width: 33%;">YEAR</th> </tr> <tr> <td style="text-align: center;">07</td> <td style="text-align: center;">06</td> <td style="text-align: center;">2009</td> </tr> </table>		MONTH	DAY	YEAR	07	06	2009																														
MONTH	DAY	YEAR																																					
07	06	2009																																					
		8. OTHER FACILITIES INVOLVED <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 60%;">FACILITY NAME</th> <th style="width: 40%;">DOCKET NUMBER</th> </tr> <tr> <td></td> <td style="text-align: center;">05000</td> </tr> <tr> <td></td> <td style="text-align: center;">05000</td> </tr> </table>		FACILITY NAME	DOCKET NUMBER		05000		05000																														
FACILITY NAME	DOCKET NUMBER																																						
	05000																																						
	05000																																						
9. OPERATING MODE 1		11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: <i>(Check all that apply)</i>																																					
10. POWER LEVEL 087		<table border="0" style="width: 100%;"> <tr> <td><input type="checkbox"/> 20.2201(b)</td> <td><input type="checkbox"/> 20.2203(a)(3)(i)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(C)</td> <td><input type="checkbox"/> 50.73(a)(2)(vii)</td> </tr> <tr> <td><input type="checkbox"/> 20.2201(d)</td> <td><input type="checkbox"/> 20.2203(a)(3)(ii)</td> <td><input type="checkbox"/> 50.73(a)(2)(ii)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(A)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(1)</td> <td><input type="checkbox"/> 20.2203(a)(4)</td> <td><input type="checkbox"/> 50.73(a)(2)(ii)(B)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(B)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(i)</td> <td><input type="checkbox"/> 50.36(c)(1)(i)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(iii)</td> <td><input type="checkbox"/> 50.73(a)(2)(ix)(A)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(ii)</td> <td><input type="checkbox"/> 50.36(c)(1)(ii)(A)</td> <td><input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(x)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(iii)</td> <td><input type="checkbox"/> 50.36(c)(2)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(A)</td> <td><input type="checkbox"/> 73.71(a)(4)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(iv)</td> <td><input type="checkbox"/> 50.46(a)(3)(ii)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(B)</td> <td><input type="checkbox"/> 73.71(a)(5)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(v)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(C)</td> <td><input type="checkbox"/> OTHER</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(vi)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(B)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(D)</td> <td>Specify in Abstract below or in NRC Form 366A</td> </tr> </table>		<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)																																				
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)																																				
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)																																				
<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)																																				
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)																																				
<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)																																				
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)																																				
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER																																				
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A																																				
12. LICENSEE CONTACT FOR THIS LER																																							
FACILITY NAME Kyle D. Christianson, Principal Licensing Engineer		TELEPHONE NUMBER <i>(Include Area Code)</i> 509-377-4315																																					
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																														
B	TI	FLT	A218	Y																																			
14. SUPPLEMENTAL REPORT EXPECTED					15. EXPECTED SUBMISSION DATE																																		
<input type="checkbox"/> YES <i>(If yes, complete 15. EXPECTED SUBMISSION DATE)</i>					<input checked="" type="checkbox"/> NO																																		
					<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 33%;">MONTH</th> <th style="width: 33%;">DAY</th> <th style="width: 33%;">YEAR</th> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>					MONTH	DAY	YEAR																											
MONTH	DAY	YEAR																																					
ABSTRACT <p>On May 8, 2009 at 1046 hours, a manual reactor scram was inserted while Columbia was operating in Mode 1 at 87% power. Loss of air side seal oil pressure and consequential loss of hydrogen pressure in the main generator occurred during testing of the seal oil system backup regulator and air side seal oil back up pump. When the backup system was activated, a crud burst of corrosion products from the back up oil supply line and biological growth from the heat exchanger plugged the single in-line filter. This caused a loss of air side seal oil pressure, allowed hydrogen to escape from the generator, and necessitated the manual scram.</p> <p>The single in-line filter, which represents a single point vulnerability as a reactor trip sensitive component and part of the original design, was previously approved for upgrade to a high efficiency duplex filter assembly but was not implemented prior to the event (Root Cause 1). No interim actions were established due to multiple process weaknesses (Root Cause 2).</p> <p>Interim risk mitigation actions to monitor the in-line filter continuously during backup system operation and startup and take actions as necessary are being established in plant operating procedures. The seal oil filter upgrade is scheduled to be implemented during the next refueling outage (R-20).</p> <p>No similar events have been reported by Energy Northwest.</p>																																							

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Columbia Generating Station	05000397	YEAR	SEQUENTIAL NUMBER	REV NO.	2 OF 3
		2009 – 002 – 00			

NARRATIVE

Plant Condition

The plant was operating in Mode 1 at 87% power at the time of this event.

Event Description

On May 8, 2009, operations personnel were testing the seal oil system [TI] back up regulator [RG] and air side seal oil back up pump [P]. The system operated on the back up regulator for approximately three minutes before the air side seal oil system pressure dropped to zero. The loss of air side seal oil resulted in a failure of the hydrogen side seal to maintain generator pressure. Hydrogen gas, initially pressurized to approximately 72 psi, escaped through the shaft seals into the turbine building. Due to the release of hydrogen from the generator [GEN], a manual scram of the reactor [RCT] was inserted at 1046 PDT and the turbine building was evacuated. This event occurred 13 hours prior to a planned shutdown for a refueling outage (R-19) with the plant in an end of cycle final feedwater temperature reduction (FFTR) lineup.

All control rods fully inserted in response to the reactor protection system (RPS) actuation. A reactor pressure vessel [RPV] water low level (level 3) trip occurred with a minimum level of -4.7 inches. One reactor feedwater (RFW) pump was manually tripped prior to level recovery and the FFTR lineup was exited. The long stroke time of the bypass valve for the high pressure feedwater heaters caused the other RFW pump to trip due to RPV high level (level 8). The pump was restarted and RPV water level control was established at 36 inches. Heat removal through the main condenser [SG] was maintained. Post trip RPV water level was maintained in the normal band using the feedwater [SJ] and condensate systems [SD]. RPV pressure was controlled using automatic control of the main turbine [TRB] bypass valves. Off-site power was available and two of three emergency diesel generators [EK] were operable and available. DG-2 was inoperable and unavailable due to DG-2 fire remote transfer switch functional operability surveillance testing. No other safety systems actuated or were required to actuate. There was no inoperable equipment at the start of the event that contributed to the event.

At 1741 EDT (1441 PDT), the NRC was notified of the RPS actuation per 10 CFR 50.72(b)(2)(iv)(B) (reference event notification number 45051). This LER is submitted pursuant to 50.73(a)(2)(iv)(A) as an event or condition that resulted in manual actuation of the RPS.

Immediate Corrective Action

Maintenance actions on DG-2 were stopped and the generator was placed in an inoperable but available status. Plant cooldown was slowed through steam load reduction. Venting of the main generator was completed. The inline seal oil filter, capable of on-line cleaning by rotating the cleaning handle, was cleared and seal oil system pressure was restored. Due to imminent refueling outage, no attempt to restart the plant was made.

Cause

The direct cause of this event was accumulated corrosion products on backup seal oil piping and biological material in the air side seal oil cooler, both due to higher than normal moisture in the oil over the past two years. These materials were released during system backup testing, which plugged the in-line seal oil system filter. Seal oil pressure dropped downstream of the plugged filter.

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Columbia Generating Station	05000397	YEAR	SEQUENTIAL NUMBER	REV NO.	3 OF 3
		2009 – 002 – 00			

Two root causes were identified: 1) The single in-line filter in the air side seal oil system, which represents a single point vulnerability as a reactor trip sensitive component and part of the original design, was previously approved for upgrade to a high efficiency duplex filter assembly but was not implemented prior to the event. 2) No interim actions were established due to multiple process weaknesses.

Further Corrective Action

The following actions are being pursued to prevent recurrence: 1) Seal oil system procedures are being upgraded to ensure the single in-line filter is monitored continuously during seal oil system startup, backup system testing, or alarm for low air side seal oil pressure or backup system activation. Actions will be taken as necessary to clear the filter. 2) Seal oil filter upgrade is scheduled to be implemented during next refueling outage (R-20).

Additional corrective actions to address contributing causes, extent of cause, and recurrence prevention include procedure revisions, leak repairs to restore oil moisture to normal, PM additions and clarifications, and training enhancements.

Assessment of Safety Consequences

For this event, High-Pressure Core Spray (HPCS) [BG], Low-Pressure Core Spray (LPCS) [BM], Reactor Core Isolation Cooling (RCIC) [BN], and Residual Heat Removal (RHR)/Low Pressure Coolant Injection (LPCI) [BO] systems were capable of performing their intended safety functions. Off-site power was available and two of three emergency diesel generators [EB and EK] (one for Division I & II and one for Division III) were operable and available. The other emergency diesel generator was not operable but available fourteen minutes after the event. This event did not involve an event or condition that could have prevented the fulfillment of any safety function described in 10 CFR 50.73(a)(2)(v). This event posed no threat to the health and safety of the public or plant personnel and was therefore, not safety significant.

Similar Events

No similar events have been reported by Columbia. Review of the corrective action program database from 2003 to present reveals no documented issues of moisture problems in seal oil prior to October 2007, at which point they became frequent. Moisture content increased by an order of magnitude, roughly 20 ppm to 200 ppm. This exposure is believed to have accelerated corrosion of carbon steel piping and vessels, increased sludge formation in the oil, and provided conditions more conducive to biological growth. Consequently, corrosion products and biological growth have developed and accumulated over the past two years in significantly higher quantity than previously experienced at Columbia.

Energy Industry Identification System (EIIIS) Information

EIIIS codes from IEEE Standards 805-1984 and 803-1983 are denoted as [X], [XX], or [XXX] throughout the body of the narrative.