

**ENERGY
NORTHWEST**

P.O. Box 968 ■ Richland, Washington 99352-0968

August 28, 2003
GO2-03-136

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. 2003-007-00**

Dear Sir or Madam:

Transmitted herewith is Licensee Event Report No. 2003-007-00 for the 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.

If you have any questions or require additional information, please contact Ms. CL Perino at (509) 377-2075.

Respectfully,



RL Webring
Vice President, Nuclear Generation
Mail Drop PE04

Enclosure

cc: TP Gwynn - NRC RIV
BJ Benney - NRC-NRR
INPO Records Center
NRC Sr. Resident Inspector - 988C (2)
RN Sherman - BPA/1399
TC Poindexter - Winston & Strawn
WB Jones - NRC RIV/fax

IE22

LICENSEE EVENT REPORT (LER)(See reverse for required number of
digits/characters for each block)

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 bis1@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.

FACILITY NAME (1)

Columbia Generating Station

DOCKET NUMBER (2)

05000397

PAGE (3)

1 OF 4

TITLE (4)

Automatic Reactor Scram due to a Main Transformer Differential Current Relay Actuation

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
6	30	2003	2003	007	00	8	28	2003	FACILITY NAME	DOCKET NUMBER
OPERATING MODE (9)		1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) (11)							
POWER LEVEL (10)		79	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)		x	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
			20.2203(a)(2)(iii)			50.46(a)(3)(ii)			50.73(a)(2)(v)(C)	Specify in Abstract below or
			20.2203(a)(2)(iv)			50.73(a)(2)(i)(A)			50.73(a)(2)(v)(D)	in NRC Form 366A
			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)(vii)(B)	

LICENSEE CONTACT FOR THIS LER (12)

NAME

R Brownlee

TELEPHONE NUMBER (Include Area Code)

509-377-2085

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
B	EL	CBL2	Rome	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE).	x	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

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

On June 30, 2003 while operating at 79% power, Columbia Generating Station automatically scrambled due to a main transformer differential current relay actuation. All equipment operated within design parameters. The cause of the relay actuation was traced to an insulation failure on a current transformer secondary wire that created an impedance unbalance in the sensing circuitry.

The root cause of this event is the original construction use of non-jacketed cable (single conductor wiring) which is more prone to failure due to fretting action.

Corrective actions were to replace main transformer current transformer wiring with jacketed cable. Jacketed cable has heavier insulation which is less susceptible to fretting. The plant's normal transformers were inspected and similar wiring was found in ideal condition.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	YEAR	LER NUMBER (6) SEQUENTIAL NUMBER	REVISION NUMBER	PAGE (3)
Columbia Generating Station	05000397		2003-007-00		2 OF 4

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

Event Description

On June 30, 2003 at 0918 hours, Columbia Generating Station (Columbia) experienced a main turbine trip followed by an automatic reactor scram. The plant was operating at approximately 79% power prior to the scram. The plant had recently commenced power operation on June 28, 2003, after completing the R16 refueling outage. As a result of the scram, all control rods fully inserted and the plant was brought to Mode 4.

Plant personnel collected data on the plant trip. It was noted that only a single main transformer differential relay target was found tripped, indicating that a true differential current fault condition probably did not occur. Additional troubleshooting inspected the current transformer (CT) circuits for non-design grounds (CTs are designed with a single point grounded). The circuits of all three main transformer phases that input into the 87TM/A, 87TM/B, and 87TM/C differential current relays were tested for grounds after the designed ground had been lifted. One of the circuits was still grounded indicating the presence of a non-design ground. Further troubleshooting revealed that the ground was on a wire in the CT circuit of the 'A' phase input to both the 87TM/A and 87TM/B relays.

Inspections of the CT circuit wiring revealed that the grounded wire and two other wires in the same conduit run showed surface damage due to fretting. There was no damage noted in other transformer wire bundles that were inspected. The fault was found in a vertical run of conduit. The particular type of wire used was a thermoplastic insulated wire with a nylon outer jacket, rated at 90°C. Approximately one inch of the outer jacket was stripped, a portion of the thermoplastic insulation was damaged, and a small spot of copper conductor was exposed. The failed wire was not found to be pulled tight or forced against a conduit access box inner surface upon inspection. There is no record of any maintenance on these wires since original installation of the equipment.

Cause of Event

The root cause of this event is the use of non-jacketed cable (single conductor wiring) that was more prone to failure through fretting action. The insulation fretting damage was caused when the wire came into contact with the inner surface of a conduit access box while in relative motion. The relative motion was caused by vibration from the transformer and other adjacent equipment such as cooler group pumps and fans.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	YEAR	LER NUMBER (6) SEQUENTIAL NUMBER	REVISION NUMBER	PAGE (3)
Columbia Generating Station	05000397		2003-007-00		3 OF 4

A contributing cause of this event was a limited extent of condition evaluation leading to ineffective corrective actions in response to a similar event in June 2000. In the previous event, a plant scram occurred due to a grounded CT. The cause of the ground was fretting at a tight elbow in the conduit. The previous corrective actions failed to prevent the event described in this LER because there was a narrow focus on bends in the conduit runs where wire may have been pulled tight across an edge, and not in vertical runs of conduit.

Safety Significance

This event posed no threat to the health and safety of the public or plant personnel. All safety equipment was available during this transient and performed as expected. Generator load rejection is bounded by the plant safety analysis. The plant trip was accompanied by a loss of one feed pump turbine due to a Reactor High Water Level 8 trip. Operations staff restarted the feed pump, and the balance of the plant shutdown to Mode 4 was uneventful.

Corrective Actions

The primary corrective action was to replace the CT conductors for main transformers TR-M1, M2 and M4 with jacketed cable. This provides a cable with heavier insulation that is less susceptible to fretting damage during installation and operation. In addition, the CT wiring for the normal transformers and the main generator was inspected, with no fretting damage observed.

Further Corrective Actions

Current transformer wiring circuits that are: 1) associated with safety and non safety-related components; 2) may be subject to fretting wear; and 3) whose failure could prevent equipment operation or cause a spurious trip, will be analyzed, inspected, and repaired or replaced as necessary during the current operating cycle and upcoming R17 refueling outage.

Previous Similar Events

As previously discussed, on June 26, 2000, a similar event occurred at Columbia when a plant scram occurred due to a grounded CT (LER 2000-003-00). The cause of the ground was fretting at a tight elbow in the conduit. The previous corrective actions associated the June 2000 event failed to prevent the event discussed in this LER because there was a narrow focus on the failure. In the June 2000 event, bend areas were inspected and the failed wire was repaired. For the event discussed in this LER the failure was found in a vertical run of conduit that was not previously investigated.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Columbia Generating Station	05000397	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 4
		2003-007-00			

EIIS InformationText

Reference	System	Component
Main Turbine	TA	TRB
Main Transformer	EL	XFMR
Differential Relay	EL	RLY-87