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January 29, 2019
GO2-19-001

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. 2018-001-01**

Dear Sir or Madam:

Transmitted herewith is Licensee Event Report No. 2018-001-01 for Columbia Generating Station, a supplement to the LER submitted on July 17, 2018. This report is submitted pursuant to 10 CFR 50.73(a)(2)(iv)(A).

There are no commitments being made to the Nuclear Regulatory Commission herein. If you have any questions, or require additional information, please contact Mr. S. A. Nappi, Regulatory Compliance Supervisor, at (509) 377-4598.

Executed on this 29th day of January, 2019

Respectfully,

A. L. Javorik
Vice President, Engineering

Enclosure: Licensee Event Report 2018-001-01

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

NRC FORM 366
(04-2018)

U.S. NUCLEAR REGULATORY COMMISSION

# LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)



| 1. Facility Name | 2. Docket Number | 3. Page |
|---|---|---|
| Columbia Generating Station | 05000 397 | 1 OF 3 |

**4. Title**

Automatic Reactor Scram Due to Main Transformer Trip

| 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 |
| 05 | 18 | 2018 | 2018 | - 001 | - 01 | 01 | 29 | 2019 | Facility Name | Docket Number 05000 |

| 9. Operating Mode | 11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: *(Check all that apply)* | | | |
|---|---|---|---|---|
| 1 | ☐ 20.2201(b) | ☐ 20.2203(a)(3)(i) | ☐ 50.73(a)(2)(ii)(A) | ☐ 50.73(a)(2)(viii)(A) |
| | ☐ 20.2201(d) | ☐ 20.2203(a)(3)(ii) | ☐ 50.73(a)(2)(ii)(B) | ☐ 50.73(a)(2)(viii)(B) |
| | ☐ 20.2203(a)(1) | ☐ 20.2203(a)(4) | ☐ 50.73(a)(2)(iii) | ☐ 50.73(a)(2)(ix)(A) |
| | ☐ 20.2203(a)(2)(i) | ☐ 50.36(c)(1)(i)(A) | ☑ 50.73(a)(2)(iv)(A) | ☐ 50.73(a)(2)(x) |
| **10. Power Level** | ☐ 20.2203(a)(2)(ii) | ☐ 50.36(c)(1)(ii)(A) | ☐ 50.73(a)(2)(v)(A) | ☐ 73.71(a)(4) |
| 100 | ☐ 20.2203(a)(2)(iii) | ☐ 50.36(c)(2) | ☐ 50.73(a)(2)(v)(B) | ☐ 73.71(a)(5) |
| | ☐ 20.2203(a)(2)(iv) | ☐ 50.46(a)(3)(ii) | ☐ 50.73(a)(2)(v)(C) | ☐ 73.77(a)(1) |
| | ☐ 20.2203(a)(2)(v) | ☐ 50.73(a)(2)(i)(A) | ☐ 50.73(a)(2)(v)(D) | ☐ 73.77(a)(2)(i) |
| | ☐ 20.2203(a)(2)(vi) | ☐ 50.73(a)(2)(i)(B) | ☐ 50.73(a)(2)(vii) | ☐ 73.77(a)(2)(ii) |
| | | ☐ 50.73(a)(2)(i)(C) | ☐ Other (Specify in Abstract below or in NRC Form 366A) | |

**12. Licensee Contact for this LER**

| Licensee Contact | Telephone Number (Include Area Code) |
|---|---|
| Tracey Parmelee, Principal Engineer, Compliance | (509) 377-8395 |

**13. Complete One Line for each Component Failure Described in this Report**

| Cause | System | Component | Manufacturer | Reportable to ICES | | Cause | System | Component | Manufacturer | Reportable to ICES |
|---|---|---|---|---|---|---|---|---|---|---|
| B | ED | RLY | ABB | Y | | | | | | |

| 14. Supplemental Report Expected | 15. Expected Submission Date | Month | Day | Year |
|---|---|---|---|---|
| ☐ Yes (If yes, complete 15. Expected Submission Date) ☑ No | | | | |

**Abstract** (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On May 18, 2018, at 0651 PDT, Columbia Generating Station experienced a Main Transformer lockout relay trip. Coincident with the unplanned trip, an external line to ground fault occurred. A Reactor scram was automatically initiated by the plant in response to the transient.

All rods fully inserted as expected; no Emergency Core Cooling Systems actuated or injected. Plant Operators effectively maintained Reactor power, pressure and level. This event did not pose a threat to the health and safety of the public.

This event was reported via Event Notification #53410 under 10 CFR 50.72(b)(2)(iv)(B) as an event that resulted in actuation of the Reactor Protection System when the Reactor was critical.

The root cause of the Main Transformer lockout and Reactor scram was that the vendor-supplied Buchholz relay did not meet the standard performance requirements to be insensitive to external faults.

# LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)



| 1. FACILITY NAME | 2. DOCKET NUMBER | 3. LER NUMBER | | |
|---|---|---|---|---|
| | | YEAR | SEQUENTIAL NUMBER | REV NO. |
| Columbia Generating Station | 05000- 397 | 2018 | - 001 | - 01 |

**NARRATIVE**

Plant Conditions
At the time of the event, the plant was operating in Mode 1 at 100% power. There were no safety related structures, systems, or components that were inoperable at the start of the event that contributed to the event.

Event Description
On May 18, 2018, at 0651 PDT, an offsite line to ground fault occurred on the 500kV network, which supplied a peak current of approximately 7kA to the Main Transformer [XFMR]. The Buchholz relay [RLY] actuated causing the Main Transformer to trip and lock out. This resulted in an automatic Reactor [RCT] scram and subsequent trip of both Reactor Recirculation [AD] pumps [P].

Reactor power, pressure, and level were maintained as expected for this condition. Safety Relief [SB] Valves [V], MS-RV-1A and MS-RV-1B, opened on Reactor high pressure, as expected for this condition. After pressure lowered below the reset point, MS-RV-1B indicated open, therefore Operations removed power supply fuses for MS-RV-1B. Safety Relief Valve tailpipe temperatures confirmed that all valves were closed. Further investigation determined that there was faulty indication for MS-RV-1B, and that the valve had closed as expected when the reset point was reached.

Suppression Pool level and temperature remained steady within normal operating limits. Reactor Pressure Vessel water level was maintained with the Condensate [SD] and Reactor Feedwater [SJ] Systems with startup flow control valves [FCV] in automatic. Reactor pressure was maintained with the Turbine Bypass [JI] Valves controlling in automatic. No Emergency Core Cooling Systems actuated or injected. The transformer lockout initiated the fast transfer to the startup transformer, which supplied offsite power to the plant electrical loads.

This event is reportable as an event that resulted in actuation of the Reactor Protection System when the Reactor was critical per 10 CFR 50.73(a)(2)(iv)(A). This event was reported under 10 CFR 50.72(b)(2)(iv)(B) via Event Notification #53410.

Immediate Corrective Actions
Per plant procedures, Operations personnel restarted a Reactor Recirculation pump to maintain core recirculation, and commenced plant cooldown.

Bonneville Power Administration performed electrical diagnostic testing of the transformer and concluded that the overall health of the transformer was acceptable. Energy Northwest replaced the Buchholz relay and implemented a temporary modification to transfer the trip function of the Buchholz relay to the sudden pressure relay. The temporary modification increases the reliability of the trip function with a two out of three trip logic, and has no effect on any safety-related design functions. The Main Transformer was then placed back in service.

# LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

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| 1. FACILITY NAME | 2. DOCKET NUMBER | 3. LER NUMBER | | |
|---|---|---|---|---|
| | | YEAR | SEQUENTIAL NUMBER | REV NO. |
| Columbia Generating Station | 05000- 397 | 2018 | - 001 | - 01 |

**NARRATIVE**

Cause of Event

The Main Transformer lockout and Reactor scram were the direct result of the actuation of the Main Transformer's Buchholz relay due to a line to ground fault in the offsite power distribution system. The root cause of this event was that the vendor-supplied Buchholz relay did not meet the standard performance requirements to be insensitive to external faults.

Assessment of Safety Consequences

This event did not challenge the ability of Columbia Generating Station to safely shut down. All Emergency Core Cooling Systems were available to perform their intended safety functions. 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.

Similar Events

Columbia has not previously experienced a Main Transformer trip or automatic scram due to actuation of a Buchholz relay. A review of the Corrective Action Program condition report database found no other occurrences of an event with similar characteristics.

Further Corrective Actions

Additional actions include implementing the temporary modification to remove the Buchholz trip and utilize sudden pressure relays for the transformer trip as a permanent configuration. The station will also correct the annunciator logic for the gas accumulation alarm.

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