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October 13, 2004
GO2-04-179

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 NOS. 2004-005-00 AND 2004-006-00

Dear Sir or Madam:

Transmitted herewith are Licensee Event Report Nos. 2004-005-00 and 2004-006-00 for the Columbia Generating Station. These reports are submitted pursuant to 10 CFR 50.73(a)(2)(iv). The enclosed reports discuss items of reportability and corrective actions taken.

If you have any questions or require additional information, please contact Mr. DW Coleman at (509) 377-4342.

Respectfully,

RL Webring
Vice President, Nuclear Generation
Mail Drop PE04

Enclosures: Licensee Event Report 2004-005-00
Licensee Event Report 2004-006-00

cc: BS Mallett - NRC RIV
WA Macon - 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

NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 6-30-2007

Estimated burden per response to comply with this mandatory 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 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	2. DOCKET NUMBER	3. PAGE
Columbia Generating Station	05000397	1 OF 3

4. TITLE

Reactor Manual Scram During Plant Startup due to High Water Level in the Pumped Drain Tank

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	15	2004	2004	- 005 -	00	10	13	2004	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

Mode 1

10. POWER LEVEL

Approximately 18%

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)*
Columbia Generating Station, Licensing, Fred Schill	509 377-8599

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

☐ 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)*

During a reactor startup on August 15, 2004, with reactor power at approximately 18%, plant operators manually initiated the Reactor Protection System in response to decreasing water level in the Reactor Pressure Vessel (RPV) following a reactor feedwater pump (RFW-P-1A) trip. The steam driven RFW-P-1A tripped as designed due to high water level in the pumped drain tank. The Reactor Core Isolation Cooling system was initiated to maintain RPV level until pressure was reduced to within the capacity of the condensate booster pumps to supply water. The subsequent plant transition to mode 4 was normal in all respects and there were no safety consequences related to the event.

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

Event Description

During a reactor startup on August 15, 2004, with reactor power at approximately 18%, plant operators manually initiated the Reactor Protection System (RPS) in response to decreasing water level in the Reactor Pressure Vessel (RPV) following a reactor feedwater pump (RFW-P-1A) trip. The steam driven RFW-P-1A tripped as designed due to high level in the pumped drain tank (MD-TK-1).

The Reactor Core Isolation Cooling [BN] system was used to maintain RPV level until pressure was reduced to within the capacity of the condensate booster pumps.

Immediate Corrective Action

Associated normal operating and annunciator response procedures were updated to verify normal hotwell level conditions and refrain from continued operation in an alarm state during relevant plant conditions. Operating crews were briefed on the changes.

A walkdown was conducted to identify other controllers, which were set to operate at high or low ends of the control band. During this walkdown, two offgas level indicating controllers were found to have excessive offsets. These controllers were repaired to correct this condition.

Cause

The fundamental condition that resulted in the manual scram was a condenser hotwell level controller that was adjusted to maintain level above the high-level alarm setpoint in the high end of the control band. During plant startup, hotwell level expectedly decreased when plant operators increased demand for reactor feedwater during power ascension. The hotwell level controller responded by transferring makeup water from the Condensate Storage and Transfer system (CST) [KA] to the hotwell. Considering the elevated level controller setpoint and its reduced response characteristics at this setting, the result was a greater quantity of water than is typically present in the condenser hotwell during a plant startup. Some of this excess water in the hotwell overflowed into the reactor feedwater pumped drain tank actuating a high level switch [JK] causing the feedwater pump trip.

The high hotwell level condition was exacerbated by the elevated setpoint of the hotwell level controller and a higher than normal water inventory available for transfer being stored in the CSTs. Both of these operational factors were implemented to accommodate the water management strategy implemented during the shutdown period. The adjustment of the hotwell level controller to the high end of the band was caused by inadequate interface requirements between normal operating conditions and strategies for shutdown water management.

The cause of this event is being investigated further and a supplemental LER will be issued if any additional insights are gained.

Further Corrective Action

Operating procedures will be revised to lower the normal operating band for CST level and administrative procedures will be revised to develop and implement improved rules and standards regarding plant water management.

Assessment of Safety Consequences

After the manual initiation of the RPS system, the subsequent operational transition to mode 4 was normal in all respects and there were no safety consequences related to the event.

Similar Events

There have been no previous similar events in which an RPS actuation resulted from actions taken to implement a water management strategy.

NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 6-30-2007

Estimated burden per response to comply with this mandatory 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 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	2. DOCKET NUMBER	3. PAGE
Columbia Generating Station	05000397	1 OF 4

4. TITLE
Reactor Manual Scram During Reactor Startup Due to Improper Restoration of Feedwater Heater

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	17	2004	2004	- 006 -	00	10	13	2004	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE
Mode 1

10. POWER LEVEL
Approximately 20%

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)
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☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
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☐ 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)*
Columbia Generating Station, Licensing, Pam Ankrum	(509) 377-4513

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

☐ 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)*

On August 17, 2004, with a plant startup in progress and with the plant in Mode 1 at approximately 20% power, a licensed control room operator improperly filled a feedwater heater with condensate following maintenance. This improper filling evolution tripped the only running reactor feedwater pump initiating a loss of feedwater transient. The reactor was scrammed manually prior to level reaching the automatic trip set point and water level stabilized using the Reactor Core Isolation Cooling (RCIC) system and the recovered reactor feedwater pump.

Failure of the Reactor Operator to follow written instructions resulted in uncontrolled filling of the feedwater heater and a momentary drop in condensate system pressure. The momentary drop in condensate system pressure directly resulted in a trip of the running feedwater pump on low suction pressure.

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. Following the plant scram, the plant was stabilized in Mode 3 without further event.

Summary

On August 17, 2004, with a plant startup in progress and with the plant in Mode 1 at approximately 20% power, a licensed control room operator improperly filled a feedwater (SJ) heater (HX) with condensate following maintenance. This improper filling evolution tripped the only running reactor feedwater pump (P) initiating a loss of feedwater transient. The reactor was scrammed manually prior to level reaching the automatic trip set point and water level was stabilized using the Reactor Core Isolation Cooling (RCIC) system and the recovered reactor feedwater pump.

Description of Event

On August 16, 2004, the plant was in Mode 2 with startup in progress. At 2020, the plant transitioned to Mode 1. During a walk down in the heater bay, a relief valve was found to be continuously lifting and a work request was generated to replace the valve. On August 17 at 0101, the Production Senior Reactor Operator (PSRO) authorized the clearance order to be hung in support of replacing the relief valve (RV). The scope of the tagout was to remove the associated feedwater heaters from service, open the condensate bypass valve, and isolate and drain the associated heaters.

On August 17, 2004 at approximately 0430, maintenance completed the relief valve replacement and the craft supervisor released the clearance order tags. The PSRO approved removal of the clearance order tags and informed the Control Room Supervisor (CRS) that replacement of the relief valve was complete. At 0440, a briefing with the Equipment Operator (without the Control Room Reactor Operator) was conducted to clear the tag. At the brief, the Equipment Operator was informed the heaters require a slow fill. The Equipment Operator completed the field portion of the tagout to close vents and drains and returned disconnects to the closed position. He then reported to the control room and transferred the clearance order lift document to a licensed Reactor Operator to complete the tag removal and restore the system.

The Reactor Operator did not adequately read the clearance order restoration instructions and did not retain them in his possession while proceeding. This Reactor Operator obtained a peer check from a second Reactor Operator who did not request the written clearance order instructions. These Reactor Operators incorrectly concluded that the instructions provided in Annunciator Response Procedure (ARP) applied to the current heater condition. This ARP presumes the feedwater heater is filled but isolated following a high level trip and provides direction to fully open the condensate valve to the heaters.

On August 17, 2004 at 0528, the Reactor Operator depressed the "OPEN" pushbutton for the valve to the feedwater heater, thereby fully opening the valve. Condensate flow was preferentially diverted from the feedwater pump suction to fill the heaters, which resulted in the low suction pressure trip on the operating feedwater pump. Control room operators manually scrammed the reactor due to the trip of the in-service feedwater pump.

Post scram information indicated the feedwater pump trip was the result of a low suction pressure condition, which was caused by the rapid refill of the first stage feedwater heater.

Cause of Event

Failure of the Reactor Operator to strictly adhere to written instructions resulted in uncontrolled filling of the feedwater heater and a momentary drop in condensate system pressure. The momentary drop in condensate system pressure directly resulted in a trip of the running feedwater pump on low suction pressure. The Reactor Operator's neglect in reading the clearance order restoration instructions represents task overconfidence.

Following Columbia Generating Station Outage R-16, a number of human performance errors occurred within the operations department and an expectation was initiated to have a supervisor or manager attend each clearance order brief. By late 2003, clearance order performance had improved. In early 2004, the expectation was relaxed and management oversight reduced significantly. Past operating crew performance improvements diminished with infrequent supervisor observations and the absence of expectation reinforcement.

The Reactor Operator involved in this event was on a performance improvement plan when the error occurred. This existing performance improvement plan did not adequately address behavior based performance shortfalls.

At the time of the event, redundant supervisory oversight barriers were diminished due to plant startup activities distracting focus from the heater restoration activities. The PSRO failed to include key control room personnel in the pre-evolution brief conducted prior to clearance order removal and system restoration. Though a more detailed plan for restoring the feedwater heaters existed, it was not included in the task for this evolution.

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. The improper restoration of the feedwater heat exchangers directly resulted in an automatic trip of the in-service feedwater pump due to low suction pressure causing a loss of feedwater flow to the reactor. The loss of feedwater flow resulted in a lowering RPV water level. The reactor was manually scrammed and the RPV water level was restored to normal using both the RCIC system and the recovered feedwater pump. The plant was stabilized in Mode 3 without further event.

Immediate Corrective Actions

Three immediate corrective actions were implemented in response to this event. The first two actions were implemented and communicated by initiation of a Night Order. The Night Order requires all Operations department briefs to be conducted by a Senior Reactor Operator (SRO) and all work order plant impacts to be independently verified by another SRO. The third immediate action was the administration of appropriate disqualification and discipline to four individuals involved.

Further Corrective Actions

There were inconsistencies identified in awareness, understanding, application and enforcement of expectations for Operations personnel performing pre-job briefings, task performance and use of human error prevention tools. To reduce these inconsistencies, Operations will conduct a review and resulting expectations will be incorporated into individual performance expectations.

The Night Order discussed under Immediate Corrective Actions will be reviewed to determine if required actions should be proceduralized and, if so, will be implemented accordingly.

Existing open individual performance improvement plans will be reviewed to ensure the aspects are behavior based versus results based. The Performance Improvement Program will also be revised to monitor improvement based on behaviors more than results.

The special instructions for recovering feedwater heaters following maintenance when the plant is on-line, which were developed during previous performance of this task, will be proceduralized.

A corrective action effectiveness assessment will be performed to ensure corrective actions are adequate to prevent recurrence.

Previous Similar Events

No previous similar events were identified in which a condition reportable pursuant to 10 CFR § 50.73(a)(2)(iv)(A) existed due to a human performance error in filling feedwater heaters due to the operator failing to follow written instructions.

The conclusion from the search is that, although human performance errors have been documented, there were no events that would have driven Energy Northwest to question the ability of Columbia Generating Station Operators to read and follow written instructions.