



Donald W. Gregoire  
Columbia Generating Station  
P.O. Box 968, PE20  
Richland, WA 99352-0968  
Ph. 509-377-8616 | F. 509-377-4317  
dwgregoire@energy-northwest.com

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10 CFR 50.59(d)(2)  
10 CFR 72.48(d)(2)

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

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397**  
**INDEPENDENT SPENT FUEL STORAGE INSTALLATION, DOCKET NO. 72-35**  
**BIENNIAL 50.59/72.48 REPORT**

Dear Sir or Madam:

Attached is the Columbia Generating Station 2016 – 2017, 50.59/72.48 Report. This report is submitted pursuant to 10 CFR 50.59(d)(2) and 10 CFR 72.48(d)(2).

There are no commitments being made to the NRC by this letter.

If you have any questions or desire additional information pertaining to this report, please contact Ms. L.L. Williams, Licensing Supervisor, at (509)377-8148.

Executed on January 23, 2018

Respectfully,

DW Gregoire  
Manager, Regulatory Affairs and Performance Improvement

Attachment: 50.59/72.48 Report  
cc: NRC Region IV Administrator  
NRC NRR Project Manager  
NRC Senior Resident Inspector/988C  
CD Sonoda – BPA/1399 (email)  
WA Horin - Winston & Strawn

## **10 CFR 50.59 Changes, Tests, and Experiments**

This section contains a brief description of any changes, tests, and experiments, including the summary of the evaluations for activities implemented during 2016 and 2017 that were assessed pursuant to 10 CFR 50.59 requirements. Energy Northwest evaluated the change reported below and concluded prior Nuclear Regulatory Commission (NRC) approval was not required.

### **5059EVAL-16-0001 Adjustable Speed Drive (ASD) System Hardening Project**

#### Background

Power to each reactor recirculation (RRC) pump motor is supplied by an ASD, which supplies variable frequency AC power to adjust RRC pump speed. Two ASD channels are associated with each RRC pump. Both channels are required in order to operate at 100% pump speed (60 Hz). A pump can be operated with only a single channel in service at a maximum speed of 51 Hz. The ASD control system will detect the loss of one channel and automatically runback to 51 Hz. Only the RRC loop operating on a single channel is affected. For example, if both A and B are operating at 60 Hz in AUTO and the A2 Channel fails, the "A" Control Station will shift to MANUAL and runback to 51 Hz. "B" will continue to operate at 60 Hz in AUTO.

Each ASD channel has an associated independent liquid cooling system to remove the heat produced by the solid-state components. Coolant temperature of 158°F will cause the associated ASD channel to automatically shut down. When this occurs, the ASD controller will detect the loss of the channel and runback the affected pump to 51 Hz.

#### Brief Description

The ASD hardening project eliminated the ASD cooling system high temperature trip function due to unreliable temperature switches. This change removes an automatic channel high temperature trip and is replaced with a manual operator action in the event of a high temperature condition of an ASD channel cooling system. The automatic functions associated with the 140°F trip (alarm and start of the channel's backup cooling fan) from these same temperature switches remains unaffected. The operators will take manual action upon receipt of the 140°F alarm. Supplementing this change are two additional manual valves. One manual valve ports around the existing temperature control valve (TCV) and a second isolates the line from the TCV that bypasses the heat exchanger during normal operation.

This change will improve reactor recirculation flow control balance. The current channel trip on high temperature causes an automatic runback of the affected pump that results in an off-balanced recirculation flow condition. When this occurs, the plant does not meet Technical Specification (TS) 3.4.1 Limiting Condition for Operation (LCO)

requirements to have two RRC loops with matched flows. Manual operator control must be taken to correct the reactor recirculation flow imbalance within two hours to avoid having to declare one recirculation loop not in operation and apply thermal limits for single loop operation.

### Summary of Evaluation

The change to replace the ASD automatic 158°F high temperature cooling system trip with an operator action was assessed in accordance with 10 CFR 50.59(c)(2). The change does not impact the frequency of any of the recirculation loop related accidents evaluated in the Final Safety Analysis Report (FSAR). System reliability has been assessed and determined to be bounded by original ASD reliability analysis with the exception of failures of the coolant temperature control valves. As part of the design change, manual valves were added to preclude failures of the coolant temperature control valves. Failures of these valves are deemed not credible in that it would require multiple valve misalignments and component failures. Likelihood of malfunctions, as well as consequences of accidents, and malfunctions are unchanged since the operation of any trips or other system behaviors relied upon as part of the accident response are not impacted by this change. No new accidents are created by this change, and the results of malfunctions determined from ASD implementation analyses, and described in the FSAR, still encompass the overall response of the system. Fission product barrier integrity is not changed since the original system design analysis remains bounding and was approved via Amendment 145. No methodology changes are associated with this change.

A failure modes and effects analysis was performed focusing on coolant temperature rise failure modes. It was determined that failure modes that would result in a rapid change in temperature in the cooling system are detected and have alarms and automatic shutdown functions of the ASD channel independent of the 158°F trip. Manual operator action will be relied on to mitigate failure modes that provide slow to moderate temperature rises of the coolant. In these cases, performing manual action, in lieu of an automatic trip and associated runback was assessed and found to be acceptable since the actions are reflected in plant procedures and training and the actions can be completed under the expected conditions prior to system cooling temperatures reaching the former automatic trip temperature. Energy Northwest therefore concluded that the changes associated with the ASD system hardening project may be implemented without prior NRC approval.

## **10 CFR 72.48 Changes, Tests, and Experiments**

No changes, tests or experiments were conducted during 2016 and 2017 that required reporting pursuant to 10 CFR 72.48 requirements.