UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
612 EAST LAMAR BLVD, SUITE 400
ARLINGTON, TEXAS 76011-4125

January 19, 2010

(b)(7)(C)

SUBJECT: RESPONSE TO CONCERNS YOU RAISED TO THE NUCLEAR REGULATORY COMMISSION (NRC) REGARDING COLUMBIA GENERATING STATION

RE: ALLEGATION RIV-2009-A-0041

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This letter refers to vour February 27, 2009, email to NRC Allegation mail account, your March 9, 2009, email statement of concerns and the subsequent follow up meeting with Mr. George Replogle, Chief, Reactor Projects Branch A, on March 11, 2009. during which you expressed concerns related to fuel corrosion at Columbia Generating Station. On July 1, 2009, you were interviewed by Special Agent Jeff Ferich of the NRC's Office of Investigations and Mr. Nicholas Hernandez, Resident Inspector, regarding your concerns. The NRC also considered the information you had provided to the NRC in your previous Allegation RIV-2004-A-0097.

On October 13, 2009, Messrs. Nickolas Hernandez, Resident Inspector, and Bob Hagar, Senior Project Engineer, spoke with you regarding the closure of your concerns. The NRC considered the associated timeline that you provided during the telephone discussion. The enclosure to this letter restates your concerns and describes the NRC's review and conclusions with regard to each concern.

Thank you for informing us of your concerns. Allegations are an important source of information in support of the NRC's safety mission. We take our safety responsibility to the public seriously and will continue to do so within the bounds of our lawful authority. We believe that our actions in this matter have been responsive and unless the NRC receives additional information that suggests that our conclusions should be altered, we plan no further action on this matter.

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Should you have any additional questions regarding our response, please contact Mr. Wayne Walker, Chief, Project Branch A, at 800-952-9677, extension 148, or you can call Ms Bernadette Baca on the NRC Safety Hotline at 800-695-7403 Monday - Friday between 8 a.m. and 4:30 p.m. Central time.

Sincerely,

Dwight D. Chamberlain Director
Division of Reactor Projects

Enclosure: As stated

RESPONSE TO CONCERNS IN
ALLEGATION RIV-2009-A-0041

Concern 1

Why has the NRC not insisted Energy Northwest increase [condensate flow demineralizer] precoat flow? (Concern statement based on telephone call with Messrs. Hernandez and Hagar and yourself on October 13, 2009)

NRC Response to Concern 1

The concern (that the NRC has not insisted that Energy Northwest increase precoat flow) was substantiated. The inspectors found no evidence that the NRC directed Energy Northwest to increase precoat flow. However, there are no regulatory requirements with regard to this concern. Therefore, there was no violation of an NRC requirement.

Concern 2

If condensate flow demineralizers D and F had performance problems that contributed to Cycle 15 fuel corrosion, then Energy Northwest misidentified the causes of those performance problems.

NRC Response to Concern 2

The inspectors reviewed the licensee's root-cause investigation of the Cycle 15 fuel corrosion (described in CGS-FTS-0160, "Columbia Generating Station Cycle 15 Fuel Corrosion Root Cause Report," October, 2003), and found that the licensee had determined that water chemistry had been the root cause of the Cycle 15 corrosion, and that condensate flow demineralizers performance had been one of several contributing causes. Although the report of this investigation identified condensate flow demineralizers' performance problems as a contributing cause of the Cycle 15 corrosion, it did not identify the causes of the condensate flow demineralizers performance problems and, therefore, did not misidentify those causes.

The NRC understands that the chemical composition of reactor coolant is a result of many factors, and that when the cause of water chemistry problems is not readily apparent, resolving those problems may involve adjusting one or more of those factors in different ways, assessing results, and modifying approaches accordingly. The NRC, therefore, considers that Energy Northwest's efforts to resolve water chemistry problems during Cycle 15 can be viewed as trying different resolutions, and not necessarily as misidentifying the associated causes.

Based upon the NRC's review and evaluation, the NRC determined your concern that Energy Northwest misidentified the causes of condensate flow demineralizers' performance problems was not substantiated.

Concern 3

During Cycle 17, Energy Northwest conducted activities that were nuclear safety concerns regarding Cycle 15 fuel. Nuclear fuel rods developed nodules in Cycle 17.

NRC Response to Concern 3

The inspectors noted that while the information provided with this concern described several activities associated with water chemistry control during Cycle 17, that information did not relate those activities to nuclear safety.

To investigate this concern, the inspectors reviewed the fuel vendor's evaluation of the Cycle 17 fuel rods, as described in document 51-91128866-001, "Evaluation of Preliminary Cycle 19 Fuel Inspection Data from Columbia Generating Station." The inspectors also reviewed 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors"; Topical Report ANF-89-98(P), "Generic Mechanical Design Criteria for BWR Fuel Designs," Revision 1; and the NRC's Safety Evaluation Report for that topical report (dated April 20, 1995).

The inspectors discovered that the Columbia Generating Station's licensing basis does not include a quantitative limit on fuel corrosion. Instead, the fuel vendor had proposed including the effects of oxidation and crud buildup in the thermal and rod internal gas pressure analyses, and the NRC had accepted that proposal.

As part of the licensee's response to the corrosion experienced during Cycle 19, the inspectors found that the fuel vendor had performed an exponential regression of corrosion liftoff measurements from Cycles 17 and 19 to obtain an estimated maximum liftoff of 101 µm for an end-of-life fuel rod, and had used a more-conservative value of 104 µm to complete a fuel rod analysis. As described in document 51-91128866-001, that analysis concluded that both the current steady-state fuel design limit (fuel design limit, i.e., linear heat generation rate) and the transient overpower limit at 135 percent of the fuel design limit were supportable to the current maximum burnup limit and with a maximum liftoff of 104 µm. Furthermore, the fuel vendor determined that their loss of coolant accident analysis remained applicable based on an assumed oxide layer of 70 µm (approximately 70 percent of the assumed maximum total liftoff of approximately 104 µm). The fuel vendor determined that the 70 µm oxide layer corresponded to approximately 7.7 percent of the cladding thickness, and that, when combined with the 0.26% of cladding thickness that was assumed to oxidize during a loss of cooling accident, the resulting total cladding thinning of approximately 8 percent due to oxidation would remain well less than the 17 percent maximum cladding oxidation limit imposed by 10 CFR 50.46. Although details of the fuel vendor's fuel rod analysis were not available for review because those details were proprietary, the inspectors considered that the results of that analysis were reasonable and, in the absence of any evidence to the contrary, therefore,

considered that analysis to be valid. Therefore, because the corrosion experienced during Cycle 17 did not affect the fuel design limit and did not invalidate the loss of cooling accident analysis, the inspectors considered that the activities that caused and/or contributed to that corrosion did not represent a nuclear safety concern.

Based upon the NRC's review and evaluation, the NRC determined your concern that during Cycle 17, Energy Northwest conducted activities that were nuclear safety concerns regarding Cycle 15 fuel was not substantiated.

Concern 4

Unclean water may have been used to clean resin strainers, leading to unnecessary fuel corrosion.

NRC Response to Concern 4

The inspectors were not able to investigate this concern, because no records were available to indicate whether clean water was used to clean resin strainers during Cycle 17. However, because (as described above) the corrosion experienced during Cycle 17 did not represent a nuclear safety concern, the actual and suspected causes of that corrosion (including whether unclean water was used to clean resin strainers) do not represent nuclear safety concerns.

Based upon the NRC's review and evaluation, the NRC was not able to substantiate your concern that unclean water may have been used to clean resin strainers.

Concern 5

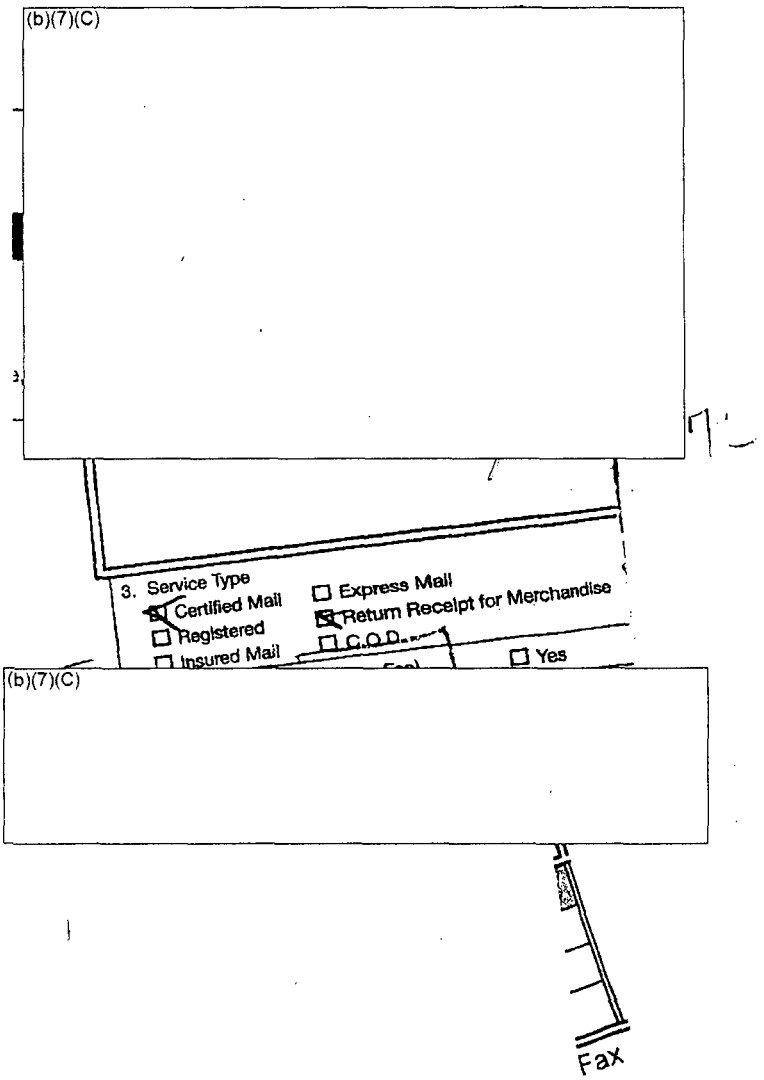
Root cause analysis may not have been performed in accordance with procedural requirements.

NRC Response to Concern 5

The inspectors noted that information associated with this concern did not identify a specific performance deficiency.

To investigate this concern, the inspectors evaluated CGS-FTS-0160, "Columbia Generating Station Cycle 15 Fuel Corrosion Root Cause Report," October, 2003, with respect to the requirements described in Procedure SWP-CAP-01, "Corrective Action Program," Revision 18, for priority-A investigations. The inspectors also interviewed one of the members of the team that prepared that report. Through that review and interview, the inspectors did not identify any indication that the team did not comply with procedural requirements.

Based upon the NRC's review and evaluation, the NRC determined your concern that root cause analysis may not have been performed in accordance with procedural requirements was not substantiated.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