



## Public Service

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Fort St. Vrain  
Unit No. 1  
P-91137

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A. Clegg Crawford  
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U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
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ATTN: Mr. Seymour H. Weiss, Director  
Non-Power Reactor, Decommissioning and  
Environmental Project Directorate

Docket No. 50-267

SUBJECT: PCRV ACTIVATION ANALYSIS VERIFICATION

REFERENCE: 1) NRC Memorandum, Erickson to Weiss, dated February 15,  
1991 (G-91064)

Dear Mr. Weiss:

This letter provides an interim report of Public Service Company of Colorado's (PSC's) efforts to verify the Fort St. Vrain (FSV) Prestressed Concrete Reactor Vessel (PCRV) Activation Analysis. In addition to the activities already in progress, PSC undertook added efforts as a result of a meeting with the NRC on February 11, 1991 (Reference 1). The attached report, "Summary of Existing and Planned Work For Activation Verification", describes the current status of these efforts and provides an overall assessment, based on results obtained to date, of the PCRV concrete removal plans and associated cost estimate information previously provided to the NRC.

As discussed during the February 11, 1991, meeting, FSV decommissioning cost estimates for concrete removal and disposal during the dismantlement of the PCRV have been based on the activation analysis. The disposal volumes used in PSC's cost estimates are based on conservative assumptions of the neutron flux levels and the concrete and rebar composition.

As described in the attached report, PSC's neutron flux verification efforts have included analysis of wire and Charpy specimens from the PCRV top head near the liner, and tendon wire samples from a vertical tendon located 32" from the PCRV liner. Based on a preliminary analysis, the measured results compare quite well with predicted activities near the liner. Also, the activity levels in the tendon wires are reasonable, considering the difficulty in predicting neutron flux levels at that distance from the core.

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During the current planning phase for FSV decommissioning, PSC's efforts to determine concrete and rebar composition are limited to materials which can be removed from the PCRV without affecting its integrity. In the absence of concrete core samples, PSC is evaluating the effects of worst case concentrations of trace element impurities, such as cobalt, europium, silver, and niobium, on PCRV activity levels and on the amount of concrete that would have to be removed. This effort includes taking PCRV concrete surface samples at various locations to confirm the conservatism of the activation analysis assumptions. After the decommissioning implementation phase is entered, several planned activities involve core drilling into the PCRV. Core samples from these activities will be analyzed to further confirm the activation analysis and support disposal efforts.

As described in the attached report, PSC has determined that the amount of concrete that must be removed to achieve an unrestricted use dose rate of 5 microR/hr is calculated to be 21", taking into account that (1) there will be no dose contribution from the top head or core support floor, and (2) the concrete need not be considered a homogeneous concrete/rebar mixture. PSC considers that the activation analysis is conservative; however, in a worst case scenario, the actual thermal flux and the actual trace element concentrations could be greater than PSC's assumed values. These worst case actual conditions could require additional concrete removal of 4" and 2", respectively, for a total required concrete removal depth of 27".

During actual PCRV dismantlement, PSC plans to remove concrete from the PCRV sidewalls by using a diamond wire cutting device, threaded through every third tube of the inner row of vertical tendon tubes. This results in a concrete removal depth that varies from 27" to 32". This will ensure adequate concrete removal, even in the worst case scenario described above.

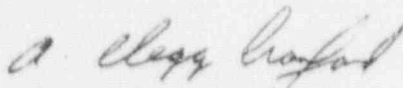
PSC's on-going efforts to verify the activation analysis include obtaining independent confirmatory laboratory analysis of the activity levels in the material samples, and analyzing concrete impurity samples from various PCRV surface locations. These efforts are expected to be completed within four months and PSC will provide the results to the NRC by August 15, 1991.

As discussed in Appendix A of the attached report and during the February 11, 1991, meeting, tritium in concrete is best treated by pathways analysis and application of the 10 mrem/year criterion. PSC does not anticipate tritium to be a dominant dose contributor or affect concrete removal, and has therefore not included tritium in the planned verification activities.

The information provided in the attached summary report establishes conservative bounding conditions for the activation analysis assumptions, and provides reasonable verification of the activation analysis results. All of the concrete removal activities discussed herein are within the scope of the concrete removal activities described in the Proposed Decommissioning Plan, and can be accomplished within the total decommissioning costs previously identified. Furthermore, the removal and disposal of concrete volumes required in the worst case scenarios is bounded by the cost estimate.

If you have any questions regarding the information provided in this submittal, please contact Mr. M. H. Holmes at (303) 480-6960.

Very truly yours,



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ACC/SWC/lmb

cc: Regional Administrator, Region IV

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