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STATUS OF ZINC INJECTION IN PWRs

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SUMMARY

Based on laboratory and other studies, it was concluded that zinc addition in a PWR primary coolant should result in reduced Alloy 600 PWSCC and general corrosion rates of the materials of construction. Because of these positive results, a Westinghouse Owner's Subgroup, EPRI, and Westinghouse provided funds to continue the development and application of zinc in an operating plant.

As part of the program, Southern Operating Nuclear Company agreed to operate the Farley 2 plant with zinc addition as a demonstration test of the effectiveness of zinc. Since zinc is incorporated in the corrosion oxide film on the primary system surfaces and Farley 2 is a mature plant, it was estimated that about 10 kgs of zinc would be needed to condition the plant before an equilibrium value in the coolant would be reached.

The engineering aspects of a Zinc Addition and Monitoring System (ZAMS) considered such items as the constituents, location, sizing and water supply of the ZAMS. Baseline data such as the PWSCC history of the Alloy 600 steam generator tubing, fuel oxide thickness, fuel crud deposits, radiation levels, and RCP seal leak-off rates were obtained before zinc addition is initiated. This presentation summarizes some of the work performed under the program, and the status of zinc injection in the Farley 2 plant.

Author Biography

Carl A. Bergmann is a Principal Engineer in the Radiation and Engineering Analyses Group in the Nuclear Technology Division of Westinghouse Electric Corporation. He has over thirty years experience in the nuclear field and has been the lead engineer for the research, development and application of dose reduction techniques to PWR nuclear plants for fourteen years. Dose reduction techniques include the application of coolant additives such as zinc and enhanced amounts of lithium to the primary coolant. He also led a study to evaluate sources of cobalt in Westinghouse designed plants. Mr. Bergmann holds a B. S. Degree in Chemical Engineering and a Masters in Business Administration.

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