

N3418. EVALUATION OF ZINC ADDITION TO PRIMARY COOLANT OF FARLEY-2 PWR

A demonstration project at Southern Nuclear Operating Company's Farley Unit 2 showed that the addition of 35-45 ppb zinc to the primary coolant resulted in lower radiation dose rates and an apparent decrease in primary water stress corrosion cracking (PWSCC) of Alloy 600 steam generator tubing. The zinc had no significant effect on fuel cladding corrosion.

Previous laboratory studies had indicated that addition of zinc to the PWR primary coolant could reduce the general corrosion rates of the primary system materials, decrease radiation fields, and partially inhibit PWSCC of Alloy 600 components. EPRI and a group of utilities from the Westinghouse Owners Group (WOG) sponsored a demonstration of zinc addition at Farley Unit 2 operated by Southern Nuclear Operating Company.

The objectives were:

- To establish whether the benefits of zinc addition in mitigating radiation fields and PWSCC of Alloy 600 that had been observed in the laboratory could be realized in an operating plant.
- To confirm that zinc addition does not have an adverse effect on fuel cladding corrosion, reactor coolant pump performance, or valve maintenance.

The following results were obtained:

- Dose rates were reduced an average of 24% at the end of Cycle 10 compared to Cycle 9. Approximately 11% of this reduction resulted from the combined effects of zinc addition and shutdown chemistry practice.
- Zinc-65 contributed approximately 7% of the total plant component dose rate.
- New indications of PWSCC in steam generator tube roll expansion transitions decreased at the end of Cycle 10 compared to other recent outages. This reduction may reflect the combined effects of zinc addition in Cycle 10 and shot peening performed at the end of Cycle 5.

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