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VARIABILITIES IN THE CALCULATION OF PWR PRIMARY COOLANT pH

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Objectives: pH values vary greatly with temperature and can vary significantly with different methods of calculation. In this paper, these variations are quantified in order to aid cross-comparison of literature values.

Comments: In the past, a variety of methods have been used leading to differences in values obtained for pH. Up to the present, calculations have usually been at the inlet temperature (often approximated to 285°C) or at 300°C. The Electric Power Research Institute (EPRI) recommends calculation at the average primary coolant temperature, which is different in each plant and may vary with time. The results from two methods of pH calculation are graphed in this paper, and the discrepancies between the two can be seen.

Remarks/Potential for dose limitation: The lithium/boron regime adopted for primary coolant chemistry has an important effect on corrosion product activity transport and hence on dose rates around the primary circuit.

References: Polley, M.V., "Variabilities in the Calculation of PWR Primary Coolant pH," *Water Chemistry of Nuclear Reactor Systems 6*, Vol. 1, pp. 192-193, British Nuclear Energy Society, London, 1992.

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