

N70. PWR PRIMARY WATER CHEMISTRY GUIDELINES - REVISION 2

Revision 2 of the PWR Water Chemistry Guidelines has been completed and approved by the EPRI Materials & Chemistry Task Force. This document was produced by an industry group consisting of 27 utility specialists, INPO, and 7 NSSS vendor and fuels representatives. After extensive consideration, the group decided to recommend an approach for optimizing primary system pH, which is based on the following principles, in order of priority:

Operate at or above $\text{pH} = 6.9$ to minimize crud deposition on fuel and enhanced Zircaloy oxidation. If such operation requires greater than 2.2 ppm lithium, the impact on primary water stress corrosion cracking (PWSCC) should be assessed. If plant-specific considerations require operation below 6.9, a fuel surveillance program should be considered.

For operation above 2.2 ppm lithium for the purpose of achieving $\text{pH} > 6.9$, plant-specific fuel and materials reviews should be performed, and a fuel surveillance program considered.

Once lithium has been reduced to 2.2 ± 0.15 ppm consistent with principles 1 and 2, lithium can either be controlled to continue operation at $\text{pH} = 6.9$, or maintained constant at 2.2 ± 0.15 ppm until a specified pH between 6.9 and 7.4 has been reached. The plant-specific pH should be selected on the basis of plant-specific impacts on fuels and materials integrity and radiation field control. There are limited data available on which to base operation above $\text{pH} = 7.4$. Therefore, it is recommended that $\text{pH} = 7.4$ (± 0.15 ppm lithium) be considered the upper operating band.

Maintain the specified pH at ± 0.15 ppm lithium until the end of the operating cycle, noting that lithium variations have greater effect on pH at lower boron concentrations.

Attempt to minimize pH fluctuations during power operation. However, during power-level changes, some fluctuation in pH changes may be unavoidable.

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