

## **N7. Effect Of Elevated Lithium/pH On Inconel 600**

There has been continuing debate concerning the effect of lithium on primary water stress corrosion cracking (PWSCC) of Inconel 600. The latest results on elevated lithium are disappointing, with increased cracking of Inconel being found in the longest running tests in the current Westinghouse program.

The original Westinghouse tests, using highly stressed specimen of mill-annealed Inconel 600, showed no effect of water chemistry on PWSCC. However, Swedish tests, using similar material with much lower stresses, reported that cracking times were significantly reduced in 3.5 ppm lithium, compared to 2.4 ppm lithium. These latest tests confirm the Swedish results. Mill-annealed material shows no chemistry effect in high and medium stress conditions, but does show an effect in the lowest stress (Swedish specimens) condition.

The obvious correlation seems to be with time to failure, with lithium effects only showing up in the longer lasting tests. Perhaps tests using specimens that crack in under 1000 hours are insensitive to the second-order chemistry effects that can be detected with specimens lasting 2000 hours.

Possibly lithium affects only the initiation and not the growth of PWSCC cracks.

*For more, see Wood, C.J., "Radiation Control News", No.5, March 1990, Electric Power Research Institute, Palo Alto, California.*