

N8. Conductivity During Early-Life Important In Fuel Oxidation And Failure

A recent EPRI report indicates that certain parameters of the early-life (less than 2900 MWd/t exposure) chemical history of a given batch of fuel correlate predictably with peak oxidation rates and the incidence of subsequent localized corrosion failure. Early-life conductivity transients and off-nominal (above 0.4 ppb) feedwater copper in-leakage are especially strong predictors of long-term cladding oxidation rates and later-life failure.

The 20 fuel batches studied consistently fell into two groups, one group more sensitive to the effects of chemical in-leakage than the other. Differences in cladding material condition undoubtedly account for this fact. Whatever the cladding material conditions, no failures were predicted or observed when the early water chemistry was controlled within the EPRI water chemistry guidelines (EPRI report NP-4947-SR)."

For more, see EPRI report NP-6779-M which briefly describes the project. Report NP-6779-SL describes the work in detail and presents supporting data.