

AREVA NP Fuel Condition Index for Boiling Water Reactors

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Abstract – Three factors are considered paramount in fuel performance: heat flux, crud layer, and oxide thickness. Both the crud layer and the oxide thickness may be affected by plant chemistry. During the last two years, AREVA NP has developed a Fuel Condition Index (FCI) that provides a method to assign a single numerical value connecting chemistry conditions to observed or expected fuel performance. The FCI also includes a heat-flux factor to allow evaluation of the condition of a BWR core. The chemistry parameters and acceptable operating ranges selected consider AREVA NP knowledge and Industry consensus. This paper describes the FCI developed by AREVA NP (patent pending) and the results of parameter sensitivity calculations that support the AREVA approach. This will provide the basis for subsequent application and benchmarking at an operating plant.