

# BNL ALARA Center Data Base

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## ROLE OF HYDROGEN WATER CHEMISTRY ON DOSE RATES

**Keywords:** COMPONENT RELIABILITY; CONTAMINATION PREVENTION; HYDROGEN WATER CHEMISTRY; SHUTDOWN DOSE RATES

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**Objectives:** The object of this project will be to review the BWR experience with respect to the impact of Hydrogen Water Chemistry (HWC) on shutdown dose rates. It has been previously reported that the impact of HWC implementation can range from negligible to very significant. This anomalous behavior will be analyzed starting from theory and using data from both the laboratory and operating plants.

**Comments:** Using theoretical data on the thermodynamic stability of the oxides, which should be present under either HWC or Normal Water Chemistry (NWC) hypotheses are being postulated which attempt to explain the observed radiation buildup data. Plant reactor water chemistry, fuel deposit data and corrosion film analyses will be used to test the hypotheses. Laboratory data from controlled tests, using simulated oxides, will also be used to help understand the mechanism at work. The impact of HWC/NWC will be explored via the results of laboratory loop testing.

**Remarks:** It is anticipated that an improved mechanistic understanding of the processes at work will lead to a successful strategy for keeping the primary system dose rates as low as possible.

**References:** Cowan, R.I., V.F. Baston, C.C. Lin and W.J. Marble, "Role of HWC on Shutdown Dose Rates," Proceedings, EPRI Radiation Field Control and Chemical Decontamination Seminar, Tampa, Florida, November 1995, EPRI Distribution Center, P.O. Box 23205, Pleasant Hill, CA 94523.

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