

BWR single train systems

BWRs by design have systems with overlapping functions where PWRs tend to have a single multi-train system to perform a function. As an example consider high pressure injection. A PWR has the HPI system generally two trains with possible a third swing pump the alternate is potentially the normal make-up/ letdown system. A BWR has the normal feedwater system consisting of 2 or 3 trains and HPCI and RCIC and at a time delay for larger units, CRD. HPCI and RCIC are single train systems. If you look at the narrow design basis functions of these systems RCIC is to maintain water level after a plant scram when the reactor vessel is isolated from the main condenser (MSIV closure, loss of condenser vacuum for example) and HPCI is to maintain reactor level after a small break LOCA. Both of these systems however receive the same start signal (Reactor Low-Low level). The BWR emergency procedure guidelines treat both equally as a high pressure reactor inventory makeup source. Losing one of these single train systems does not lose the function of inventory control with the reactor at high pressure.

The PRA models underlying the RICT calculations include the multiple systems in their scope and so the impact of loss of one of the single train systems is directly numerically addressed in the determination of the RICT. They should be allowed to be included in a site's RICT program scope if they meet the requirement for inclusion.