

BWR and PWR Water Chemistry Guidelines Fully Revised by End of 2008

Consistent with its industry commitment to provide clear, up-to-date and technically based requirements for water chemistry at nuclear power plants, EPRI is releasing three guideline revision documents between December 2007 and December 2008: Boiling Water Reactor Water Chemistry Guidelines, Pressurized Water Reactor Primary Water Chemistry Guidelines, and Pressurized Water Reactor Secondary Water Chemistry Guidelines. These three guidelines documents contain Mandatory, Needed, and Good Practice elements, consistent with industry guidance developed for materials issues (e.g., NEI 03-08).

As illustrated in the accompanying tear-drop figure, the effects of water chemistry on materials degradation, fuel performance, radiation fields, and overall plant performance must be considered and weighed appropriately. Given the complexity in managing these issues, close collaboration with other EPRI programs is required. For example, the Fuel Reliability Program (FRP) provides expertise to consider potential impacts on fuel performance; the BWR Vessels and Internals Program (BWRVIP), Materials Reliability Program (MRP) and Steam Generator Management Program (SGMP) provide expertise on materials-related degradation impacts for BWR, PWR primary chemistry and PWR secondary chemistry, respectively; and the Radiation Management Program provides expertise regarding the effects of chemistry on plant radiation fields.

The three water chemistry guidelines are individually reviewed by an industry committee on a two-year basis and revised on a four-year basis. EPRI published the PWR Primary Water Chemistry Guidelines, Revision 6, in December 2007 (EPRI Technical Report No. 1014986). Full implementation is required by June 17, 2008 (by Sept. 17, 2008 if a plant's refueling outage occurs between Dec 17, 2007 and June 17, 2008). Significant changes include:

- More emphasis on elevated pH operation
- More guidance on pH control during chemistry transients
- Changes to some of the required and diagnostic parameters
- Updated methodology for plant-specific optimization to reflect lessons learned

The PWR Secondary Water Chemistry Guidelines, Revision 7, will be completed by December 2008. The industry committee is scheduled to submit a draft version for multi-layer review by various SGMP committees and the U.S.

Nuclear Regulatory Commission by July. Significant issues include:

- Guidance specifically tied to steam generator tubing material in recognition of the improved corrosion resistance of newer materials such as Alloy 600TT and 690TT
- Dispersant application for mitigating steam generator fouling
- Steam generator wet layup requirements and hydrazine requirements during operation
- Increased flexibility for plants during startup

The BWR Water Chemistry Guidelines, 2008 Revision, is also scheduled for completion by December 2008, with draft submittal to several BWRVIP and FRP committees by July. Significant issues include:

- Requirements to support fuel performance and reliability, consistent with the industry's Zero by 2010 fuel failure initiative.
- Mitigation of materials cracking issues via on-line noble metal chemical addition and improved hydrogen availability
- Review of feedwater iron and zinc limits
- Enhanced monitoring recommendations

Implementation of the second two guidelines will follow a six-month schedule similar to that of the PWR Primary Water Chemistry Guidelines.

Contact Information

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