

Discussion Of Topical Reports

BWRVIP-62, "Technical Basis for
Inspection Relief for BWR Internal
Components with Hydrogen Injection

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November 4, 2003

BWRVIP-62, “Technical Basis for Inspection Relief for BWR Internal Components with Hydrogen Injection”

- The Draft Safety Evaluation was issued by the staff in January 2001.
 - The following items were addressed:
 - Role of fluence on crack growth
 - Effective hydrogen water chemistry programs using ECP measurements
 - Noble metal chemical application
 - Assessment of effective HWC effectiveness on components with different radiation levels
- By letter dated August 1, 2001, the BWRVIP responded to these open items.

Discussion of Open Items for BWRVIP-62

- In addressing Open Item 3.2.3 on the hydrogen-oxygen molar ratio needed for protecting stainless steel components from IGSCC, the BWRVIP demonstrated that maintaining a molar ratio of 2 or higher ensures an ECP lower than -230 MV (SHE). At this ECP, stainless steel components are protected from IGSCC. The hydrogen-oxygen molar ratio is, therefore, a good indicator of protection of the stainless steel components from IGSCC. As indicated in the BWRVIP's submittal, this applies to practically all in-vessel components with the exception of those located in the mixing plenum. At this location, the hydrogen-oxygen ratio never reaches a value of 2. Discuss how the protective environment ($ECP \leq -230$ mV) is determined for the components in this location.

Discussion of Open Items for BWRVIP-62, Cont'd

- In the response to Open Item 3.2.3, the BWRVIP presented curves for molar ratio vs concentration for hydrogen in feedwater for several plants. Explain why the curves for different component locations intersect the molar ratio line of 2 at one single point. Is something specific in the Code used in calculating these curves?

Additional Staff Issues Related to Effective Availability to HWC:

- Effective availability of HWC on upper/lower plenum; core shroud under the following conditions:
 - Sudden increase in conductivity for a duration amount greater than 24 hours
 - Presence of any crevice condition, for example control rod blades
 - Presence of cold-worked surfaces due to grinding on the welds
 - Is it necessary to increase the hydrogen/oxygen molar ratio to minimize crack growth under these conditions? Why or why not?

Additional Staff Issues Related to Effective Availability of HWC, Cont'd

- How does the ECP model take into account presence of crevice conditions in components? For example, spargers, mating surfaces of core plate and core plate flange; top guide/top guide flange.
- IASCC may be affected by the presence of interstitial elements such as boron and nitrogen in the base metal. How does the ECP model address this issue?
- Open discussion on KKM crack flanking issue related to NMC additions

Attached Background Information (Proprietary):

1. BWRVIP Response to BWRVIP-62 Open Items
2. Figure 5/Hydrogen to Oxygen Molar Ratio/ECP Model for Susquehanna