Dominion Engineering, Inc.

LT-ZiP™ Dose Reduction & Passivation Treatment

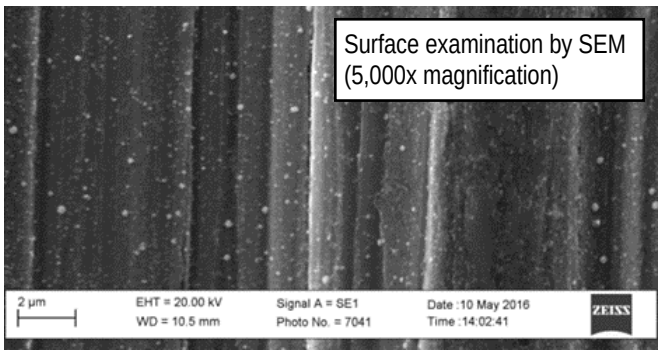
Background

Chemical decontamination is routinely performed to remove activated corrosion products from BWR plant piping and reduce plant dose rates. While chemical decontamination is generally effective for these objectives, plant dose rates may quickly return to pre-decontamination levels as piping recontaminates over the next few operating cycles.

At some BWRs, platinum has been deposited at low temperature after decontamination to protect plant piping from intergranular stress corrosion cracking (IGSCC). Low temperature platinum deposition has also generally been shown to mitigate piping recontamination rates. However, many factors influence recontamination rates, and deposition of platinum alone is not reliably effective in mitigating recontamination (results vary depending on plant conditions maintained, particularly during early operation following startup).

Description

LT-ZiP™ is a process which deposits both zinc and platinum on BWR plant piping at low temperature following chemical decontamination. The process is applied in a similar manner to other post-decontamination treatments, and provides more robust protection against piping recontamination following chemical decontamination.



Zn and Pt surface coverage after LT-ZiP™

LT-ZiP™ application at US BWR

Features and Benefits

- Upon restart, oxides formed at BWR operating conditions are enriched in Zn and Pt
- Zn suppresses Co-60 uptake and preserves low dose rates after chemical decon
- Pt deposition is a proven approach to mitigate IGSCC until online noble metal addition is restarted following chemical decon
- All LT-ZiP™ chemicals are qualified for use within BWR primary circuits, and compatible with other chemistry practices

Industry Experience

- Successfully applied at US & non-US BWRs
- Up to 40% suppression of Co-60 uptake observed after chemical decon
- Can be applied in concert with HE-UFC™ ultrasonic fuel cleaning to further mitigate piping recontamination rate
- Provides added protection against piping recontamination, even in the case of unexpected Co-60 redistribution events

For more information, contact Mike Little (*mlittle@domeng.com*), or Chuck Marks (*cmarks@domeng.com*)