RIC 2010
School of Hard Knocks - Learning from Generic Safety Issue 191

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Current Situation

- Generic Safety Issue (GSI)-191 and Generic Letter (GL) 2004-02 remain open
  - 14 years since GSI-191 was initiated
  - Over 4 years since GL 2004-02 was issued
- Issue is potential for clogging emergency core cooling system (ECCS) strainers after a loss-of-coolant accident (LOCA)
- NRC intends to close the issues in 2010 for all pressurized water reactors (PWRs)
- New round of discussions regarding boiling water reactor (BWR) strainer performance is underway

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What Does Issue Closure Look Like?

- NRC will close GSI-191 and GL 2004-02 in 2010 when NRC staff accepts:
  - Licensee evaluation and testing methods as documented in licensee submittals
  - Licensee commitments to have implemented methods acceptable to NRC staff to show adequate ECCS strainer performance by date certain
  - Actions complete not later than end of second refueling outage beginning with fall 2010 outages

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Current Status of Issue Resolution

- NRC staff has tentatively accepted an invessel blockage criterion in WCAP-16793 (as revised by responses to staff questions)
- NRC staff has not accepted reference to several technical reports that credited reduced zones of influence (ZOI) for insulation and inorganic zinc coatings
- NRC sending letters to licensees requesting path forward and commitment absent reference to the ZOI reports – retesting and/or modifications possible
- NRC staff continuing to interact with licensees to resolve remaining plant-specific issues

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Lessons Learned

- Enormous resources have been applied to address sump performance issue for PWRs
- Now considering similar questions for BWRs and for new reactor applications
- BWRs in better “starting point” for discussions than were PWRs due to extensive corrective actions taken for BWRs in 1990s
- NRC and licensees/vendors need to benefit from what we have learned, so resolution for BWRs will be both quicker and more efficient

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Lessons Learned

- Especially for complex issues, crucial to implement enhanced communication among NRC staff, licensees, and vendors
- For issues with many aspects and uncertainties, important to step back and consider the big picture
- Need clear and early communication of regulatory expectations
- Licensees should ask hard questions of their vendors regarding adequacy of the vendors’ methods

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Lessons Learned

- NRC staff may need to “step outside the box” in some ways to help bring difficult issues to closure
- Tension between “reasonable” scope of regulatory evaluation and need to ask hard questions may require hard management decisions
- Risks in decision to take immediate actions in face of incomplete evaluations and testing should be carefully evaluated
- Continue to consider risk-informing decisions on path forward and issue resolution

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The Biggest Lesson Learned

- There is a conflict between a system designed to recirculate water from the containment floor and the presence of large amounts of fibrous and particulate materials subject to near-term post-LOCA degradation
- Testing appears to show that “strainers” (both at the ECCS suction and at the fuel inlets) do not have a very high capacity for retaining debris while passing a substantial amount of water
- It is clearly advisable from many perspectives to minimize use of potentially problem materials in containment

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Planning for the Future

- As discussed by other speakers, major challenge for licensees will be the complex licensing bases adopted to address sump issues
  - Lack of an accepted model for effects of incremental changes in debris source term
  - A small amount of debris goes a long way
  - Nature of the problem (relatively steep head loss increase once a filtering bed is achieved)
  - Retesting time-consuming and expensive, not supportive of operability determinations

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Future NRC Activities

- Issue Regulatory Issue Summary providing guidance on maintaining licensing basis and sump performance, and related subjects
- Document sump performance knowledge base in one place
- Revise Regulatory Guide 1.82
- Achieve appropriately consistent regulatory treatment of BWRs and PWRs
- Closely follow and interact with industry activities regarding BWRs, with regulatory actions as needed

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