
GSI-191

PWR Sump Debris Blockage



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Acronyms

- ANL – Argonne National Laboratory
- ACRS - Advisory Committee on Reactor Safety
- CalSil – Calcium silicate insulation
- GL - Generic Letter
- GSI - Generic Safety Issue
- LANL – Los Alamos National Laboratory
- NEI - Nuclear Energy Institute
- NRC - Nuclear Regulatory Commission



Presentation Outline

- Background
- Generic Letter 2004-02 Responses
- Chemical Effects
- Downstream Effects
- Coatings
- Reminder of NRC Expectations
- Schedule Challenges
- Future Staff Actions



Background

- NRC Bulletin 2003-01 issued June 9, 2003
- GL 2004-02 - Sep 2004
- Methodology approved to evaluate sump performance - Dec 2004
- Licensee responses to GL – Sep 2005
- Modifications to sump completed - Dec 31, 2007



September 2005 Generic Letter Responses

- Information needed to confirm progress
- Confirmed that all PWR licensees are upgrading or have recently upgraded their sump strainers.
 - 66 of 69 plants are replacing their existing sump screens
 - Remaining 3 plants had previously replaced their screens
- However, much of the requested information was incomplete



Examples of Incomplete Information

- No licensee was able to completely answer the questions requesting specific results of their evaluations
- Many licensees did not provide:
 - An adequate general description of and planned schedule for changes to the plant licensing bases
 - A description of the existing or planned programmatic controls to control debris
 - An assessment of chemical effects
 - An assessment of downstream effects



Chemical Effects

- Joint NRC-industry screening tests at LANL showed chemical products can form in representative post-LOCA containment pools.
- Tests with trisodium phosphate and calcium based insulation (e.g. cal-sil) produced significant head loss. (IN 2005-26 & Supplement)
- Current NRC sponsored head loss tests at ANL are quantifying the head loss consequences from chemical products in various environments.
- Extensive NRC-industry interaction on this topic.



Downstream Effects

- No licensee has fully completed their downstream effects evaluation.
- Approximately 50% of licensees plan modifications to address concerns
- Approximately 50% of licensees plan confirmatory testing to validate design evaluation assumptions
- Almost all licensees referred to Westinghouse Owners Group (WOG) report WCAP-16406P in September responses



Coatings

- NRC adopted conservative positions for zone of influence, debris generation, and transport of coatings debris to the sump due to lack of available test data.
- Plants may deviate from the NRC's positions if they provide technical justification (test data).
- Industry testing may include:
 - Zone of influence reduction
 - Performance of non-qualified coatings
 - Characteristics of coating debris (size of chips or particles)
- NRC staff will evaluate any testing that licensees provide to ensure that it is technically sound and applicable.
- NRC also sponsoring confirmatory coating transport tests.



Reminder of NRC Expectations

- All actions completed by December 31, 2007
- Confirm adequacy of proposed modifications for each plant
 - Demonstrate that generic industry chemical tests bound plant specific chemistry of sump water
 - Demonstrate that qualified coatings continue to meet qualifications or assume that they fail
- Three plants that previously replaced sump strainers are expected to demonstrate adequacy using approved evaluation methodology and account for plant specific chemical effects
- Update information requested by Sep 2005 to address identified shortcomings



Schedule Challenges

- If corrective actions will not be completed by December 31, 2007, describe how the applicable regulatory requirements will be met
- Requests for delay will be more favorably viewed if interim compensatory measures include physical improvements
- License Amendments - Due to schedule slippages and late submittals, the staff's ability to review and approve the amendments to meet licensee's startup schedules will be challenged



Future Staff Actions

- Ongoing chemical effects and coatings confirmatory testing
- Audits of selected plants
- Verification of hardware changes by regional inspectors
- Frequent meetings with the ACRS between Feb 2006 and April 2006

