



NRC Generic Communications on GSI-191

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Presentation Outline

- NRC's generic communication strategy for GSI-191
 - Bulletin 2003-01
 - ▶ Contents of bulletin
 - ▶ Multi-plant action guidance
 - ▶ Temporary instruction
 - Planned generic letter
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NRC's Generic Communication Strategy for GSI-191

- NRC's two-pronged generic communication approach for GSI-191 includes a bulletin and a generic letter
 - ▶ Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors," issued to address near-term interim measures
 - ▶ Generic letter being developed to address longer-term corrective actions
- Two-pronged approach balances the need for an expeditious response to a potential near-term safety concern with the opportunity for public comment on longer-term regulatory activities



Bulletin 2003-01

- Bulletin 2003-01 was issued on June 9, 2003
 - NRC requested that PWR licensees respond to bulletin within 60 days (i.e., by August 8, 2003)
 - At a public meeting on June 30, 2003, the NRC staff discussed the bulletin in detail and answered stakeholder questions
 - Staff will summarize the bulletin and attempt to answer additional stakeholder questions today
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Bulletin 2003-01: Purposes

- Inform PWR licensees of NRC-sponsored research demonstrating the potential for recirculation sump screen blockage
- Inform PWR licensees of additional adverse effects of debris blockage of necessary flowpaths upstream and downstream of screen
- Request information from PWR licensees describing:
 - ▶ Compliance with existing requirements
 - OR –
 - ▶ The implementation of interim compensatory measures
- Require a written response per 10 CFR 50.54(f)



Bulletin 2003-01: Background

- Issue generic communications to PWR licensees regarding potential debris blockage concerns
- PWR and BWR ECCS recirculation performance
 - ▶ Bulletin 2003-01 issued to address interim measures
 - ▶ Future generic letter (planned for Spring 2004) to address evaluations and corrective actions
- Review industry-developed guidance to ensure its acceptability for use in evaluating recirculation sump performance
- BWR strainer blockage issue addressed following several ECCS strainer clogging events in mid-1990s
- Oversee licensee activities to ensure adequate recirculation sump performance
- Research indicates sump screen clogging may not be adequately addressed at operating PWRs
 - ▶ Review of generic communication responses
 - ▶ Temporary filter debris could be generated by LIGA that had been originally considered
 - ▶ Sump units particulate debris performance evaluations result in higher head losses than had been originally considered
- NRC's approach complements industry program to minimize regulatory burden



Bulletin 2003-01: Debris Blockage Phenomena

■ Debris Generation

- ▶ Jet impingement, pressure waves
- ▶ Containment temperature/humidity, flooding
- ▶ Pre-existing debris (e.g., dirt, dust, foreign material)

■ Debris Transport

- ▶ Spray/break flow entrains debris and washes it down to containment pool
- ▶ Suspended debris is drawn to sump when recirculation begins

■ Debris Accumulation and Head Loss

- ▶ Suspended debris tends to form a uniform bed
 - ▶ Debris bed acts as a filter, increasing head loss
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Bulletin 2003-01

Debris Blockage Concerns

- **Sump Clogging**
 - ▶ Parametric Study demonstrates credibility of ECCS and CSS pumps' losing NPSH margin during recirculation
- **Sump Screen Structural Integrity**
 - ▶ Current PWR sump screens could lose integrity under loadings from flow through mechanically determined debris beds
- **Upstream Blockage of Containment Drainage Flowpaths**
 - ▶ Blockage at flow restrictions in drainage paths could prevent water from returning to sump and reduce available NPSH
- **Downstream Blockage of ECCS and CSS Recirculation Flowpaths**
 - ▶ Debris passing through unanalyzed screen openings could cause blockage that interrupts required cooling flows



Bulletin 2003-01

Requested Information

- Within 60 days of date of the Bulletin, PWR licensees are requested to provide the information requested in either Option 1 or Option 2:
 - ▶ Option 1: State that the ECCS and CSS have been analyzed with respect to the debris blockage effects identified in the bulletin and are in compliance with existing regulatory requirements
 - ▶ Option 2: Describe any interim compensatory measures that will be implemented to reduce the risk which may be associated with a potentially degraded ECCS or CSS until an evaluation to determine compliance is complete. Provide justification if any of the example compensatory measures in the bulletin will not be implemented and for any extended implementation schedules.



Bulletin 2003-01

Example Interim Measures

- **Operator Training on Sump Clogging**
 - **Procedural Modifications to Delay Recirculation**
 - **Ensuring Availability of Alternative Water Sources**
 - **More Aggressive Containment Cleaning/Foreign Material Controls**
 - **Ensuring Containment Drainage Paths are Unblocked**
 - **Ensuring Sump Screens are Free of Adverse Gaps and Breaches**
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Bulletin 2003-01: Intent

- Intent of Bulletin 2003-01 is that PWR licensees consider near-term interim measures that could reduce risk due to potentially degraded sump performance as evaluations and corrective actions proceed
 - ▶ NRC-sponsored study found that potential interim risk of sump blockage could be reduced by proper mitigative measures
- Written NRC staff responses to industry questions concerning Bulletin 2003-01 (ADAMS Acc. # ML031810371) were presented at the June 30th public meeting
 - ▶ Key messages included:
 - Interim measures should not increase risk/be adverse to safety
 - Interim measures should not violate regulatory requirements
- Staff is available to answer additional questions



Bulletin 2003-01: Review of Responses

- NRC Staff has developed multi-plant action (MPA) guidance for reviewing bulletin responses
 - Purpose of MPA guidance is to provide criteria for PWR project managers to determine whether a more detailed technical review will be required
 - ▶ Project manager review considered sufficient for responses that implement interim measures consistent with the examples measures in the bulletin as soon as practical
 - ▶ If criteria in MPA guidance are not met, it does not indicate that response is inconsistent with intent of bulletin, only that a more detailed technical review will be necessary
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Bulletin 2003-01: Temporary Instruction

- Temporary Instruction (TI) on Bulletin 2003-01 has not yet been issued and is not finalized
 - ▶ TI is currently undergoing comments from NRC Regional Offices
 - ▶ NRR is considering the resolution of the comments that have been received
 - ▶ TI planned for issuance in August 2003
- Primary purpose of TI is to ensure that licensee actions are consistent with bulletin responses and the bulletin's intent
- Secondary purpose of TI is to verify PWR licensees are performing containment condition assessments to ensure that they are prepared to perform sump evaluations soon after guidance is issued



Bulletin 2003-01: Temporary Instruction

■ Option 1 Responses

- ▶ Inspectors would determine whether the evaluation on which the Option 1 response is based is a mechanistic evaluation or whether it is based on an arbitrary assumption (e.g., 50% of the screen becomes blocked by debris)
- ▶ TI would not request a detailed review of the adequacy of the methodology used for the mechanistic evaluation

■ Option 2 Responses

- ▶ Inspectors would verify that the interim measures identified in the bulletin response have been implemented or are planned for implementation
- ▶ Inspectors would review licensee's schedule to ensure interim measures are implemented as soon as practical
- ▶ Inspectors would review whether licensee has examined possible site-specific interim measures in addition to generic examples listed in bulletin



Planned Generic Letter

- NRC plans to issue a generic letter to request information from licensees concerning the adequacy of their recirculation sump performance
 - ▶ Generic letter is currently in a draft stage
 - ▶ Current schedule indicates draft issuance for public comment in Fall 2003/Winter 2004
 - ▶ Current schedule indicates final issuance in Spring/Summer 2004
- Planned generic letter will likely address the same debris blockage concerns identified in Bulletin 2003-01
 - ▶ Sump screen clogging (pumps' loss of NPSH margin)
 - ▶ Sump screen structural integrity
 - ▶ Blockage of containment drainage paths (upstream blockage)
 - ▶ Blockage within ECCS, CSS, and the RCS (downstream blockage)



Planned Generic Letter

- Generic letter (GL) information request planned for a timeframe to allow licensees to use industry guidance following NRC approval of guidance
- Planned GL may request information such as:
 - ▶ The guidance/methodology used to perform the sump evaluation
 - ▶ An implementation schedule for any modifications the evaluation demonstrates to be necessary
 - ▶ A description of interim compensatory measures to be taken until necessary modifications can be performed
 - ▶ A basis for concluding that the debris blockage concerns associated with GSI-191 do not adversely impact sump performance once any necessary modifications are complete
 - ▶ A description of any controls in place to ensure material brought into containment would not degrade sump performance