

Industry Activities to Address PWR ECCS Sump Performance

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Session W3D – GSI-191

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GSI-191, PWR Sump Performance

- GSI-191 applies to all 69 pressurized water reactor units in U.S.
- Each unit is unique in one or more important design aspects:
 - Insulation materials
 - Containment coatings (both qualified and unqualified)
 - Containment design (compartmentalized, open)
 - Sump design
 - NPSH requirements
- The high level of design variation requires plant-specific resolution approach for each plant



Evaluation Guidance Development

- Development of Industry Evaluation Guidance began following issuance of NUREG/CR-6762, Parametric Evaluation for PWR Recirculation Sump Performance (2002)
- NEI 02-01, Debris Sources Inside Containment (2002) issued to begin plant data collection activities
- Bulletin 2003-01, Potential Impact of Debris Blockage on Emergency Sump Recirculation at PWRs (2003) called for compensatory actions



GL 2004-02

- GL 2004-02, *Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors*, issued September 2004
- Requested PWR licensees to perform an evaluation of recirculation functions and, if appropriate, take additional actions to ensure system function
- GL schedule:
 - By 2/28/05 – provide description of evaluation methodology to be used and schedule for completion
 - By 9/1/2005 – provide results of evaluation
 - By 12/31/2007 – complete all actions, including necessary plant modifications

Industry Guidance (NEI 04-07)

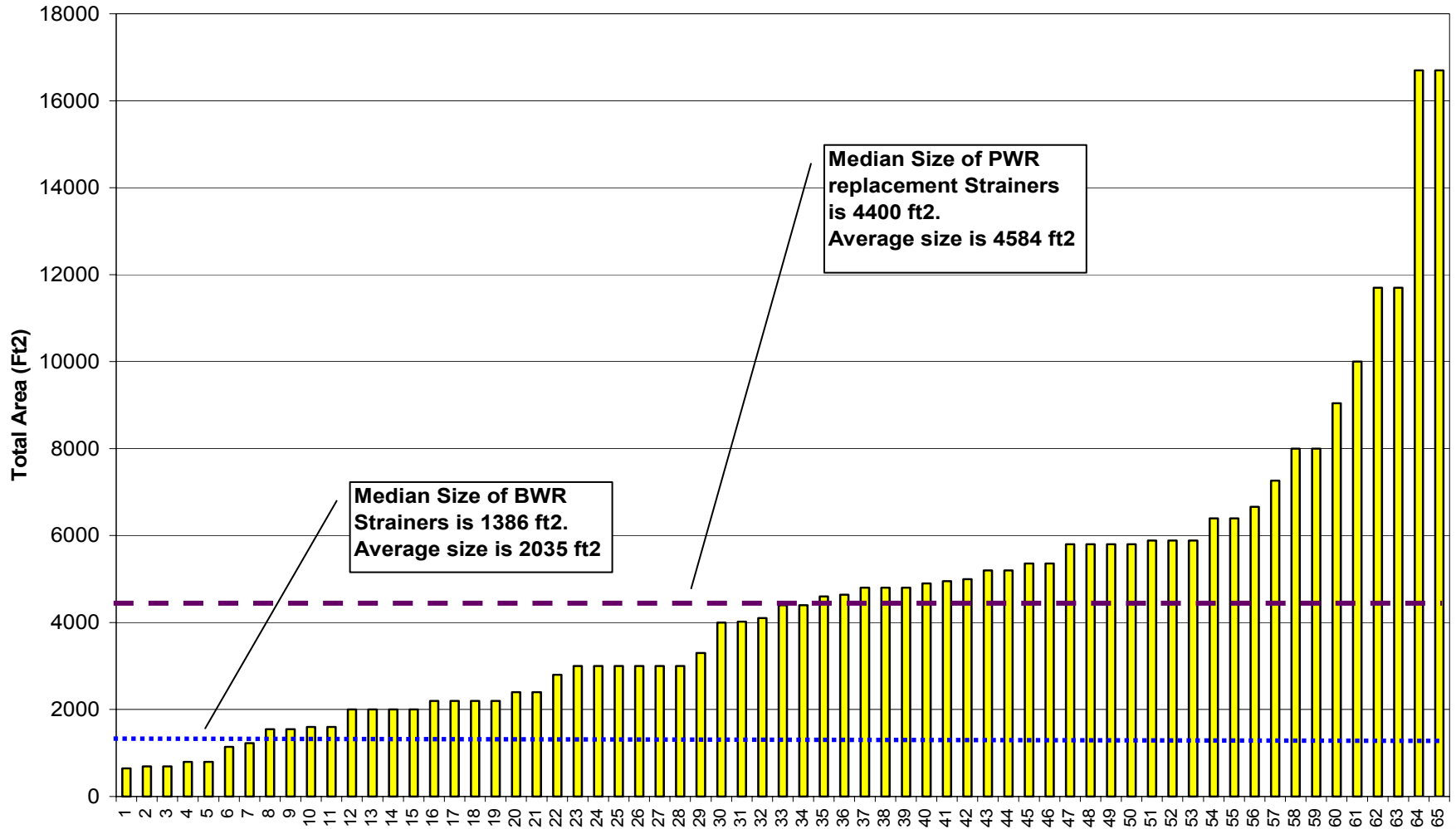
- Evaluation guidance, developed in coordination with the WOG, was issued as NEI 04-07 in December 2004
- Supplemental guidance was prepared by the WOG to support evaluation in two areas not addressed in NEI 04-07
 - WCAP 16406-P, *Evaluation of Downstream Sump Debris Effects in Support of GSI-191*, issued June 2005
 - WCAP-16530, *Evaluation of Post-Accident Chemical Effects in Containment Sump Fluid to Support GSI-191*, issued February 2006

Industry Resolution Activities

- All 69 plants have completed evaluations necessary to assess need for strainer modifications
 - Three units have assessed that their current strainers are appropriately sized
 - Sixty-six units plan to replace their current strainers
- Active – Passive – Undetermined
 - Four units intend to install active strainers
 - Remaining units are passive strainers



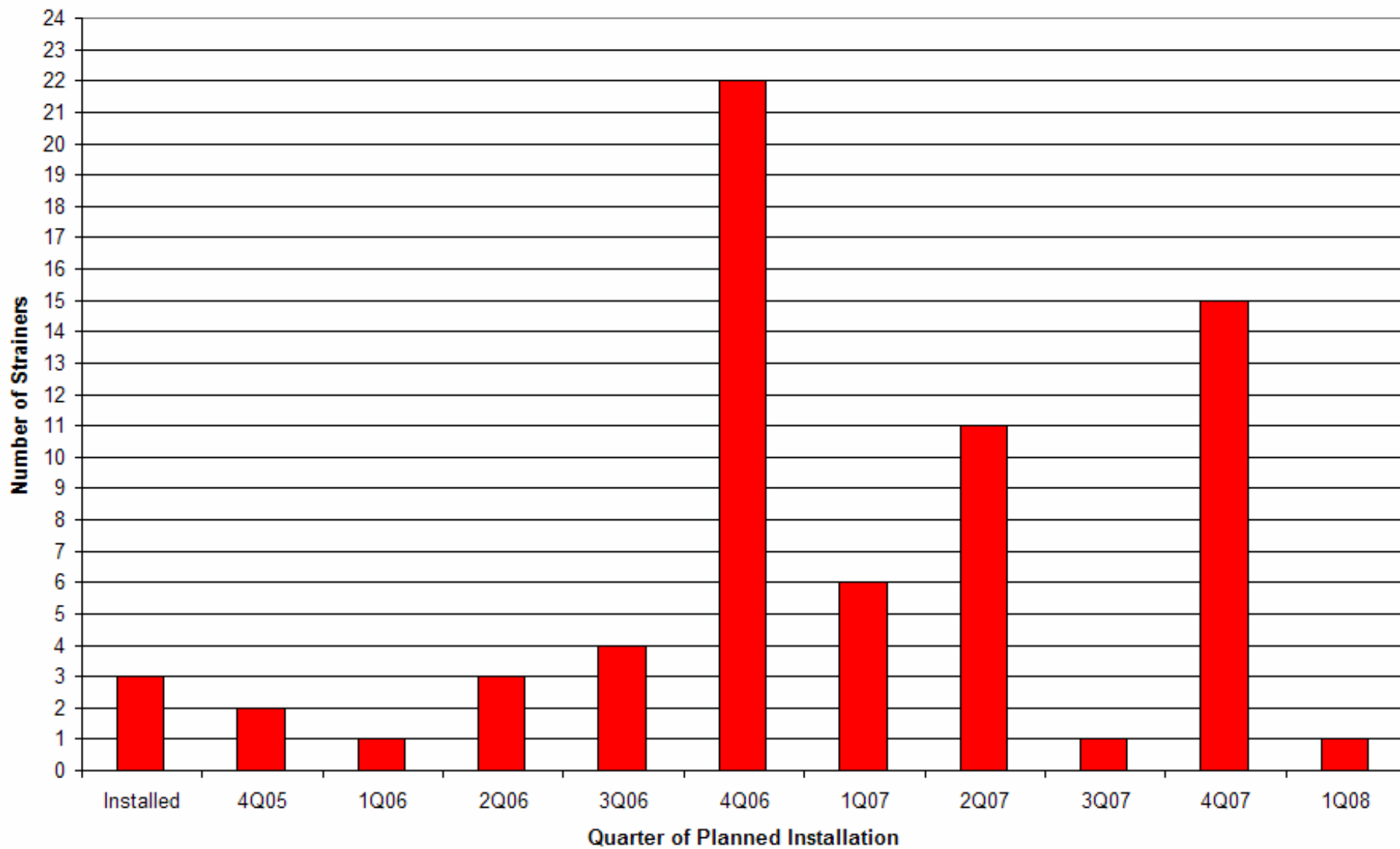
Estimated Size of PWR Replacement Strainers (Passive Strainers only)



Factors Affecting Strainer Size

- Plant design factors
 - NPSH margin
 - Containment insulation materials
 - Coatings
- Conservatism in Analysis
- Addition of Margin

Planned Strainer Installation



Other Plant Activities

- Actions to address debris sources
- Containment modifications beyond strainer installation
- Downstream modifications
- Programmatic changes



Industry Test Activities

- WOG Chemical Effects Testing
- Strainer Qualification Testing
- WOG Alternate Buffer Project
- STARS Coatings Tests
- FPL/ARIVA Coatings Tests



Summary

- Activities for plant-specific resolution of GSI-191 are well underway
- Remaining uncertainties are being addressed through conservative application of evaluation methodology, testing and strainer design
- Industry sponsored and plant-specific testing activities will continue in support of final designs

