



GSI-191, “Assessment of Debris Accumulation on PWR Sump Performance”

Sanjoy Banerjee

Advisory Committee on Reactor Safeguards

September 29, 2010

September 17, 2010, ACRS Letter

- ***The staff has thoroughly reviewed three options to close GSI-191***
- ***Option 1, which maintains the current holistic resolution process, and Option 2, which would develop risk-informed guidance that takes into account the lower probability of large-break loss of coolant accidents (LOCAs), are both acceptable, provided that a reasonable schedule for reaching resolution is adopted***

September 17, 2010, ACRS Letter

- ***Option 3, which would use GDC-4 to exclude debris generation during LOCAs for leak-before-break (LBB) qualified piping, should not be considered further***

September 17, 2010, ACRS Letter

- ***Although more information and analyses will become available in time, current experience suggests that doses for large scale replacement of insulation at the remaining plants are likely to be at or below the lower end of the range estimated by NEI***

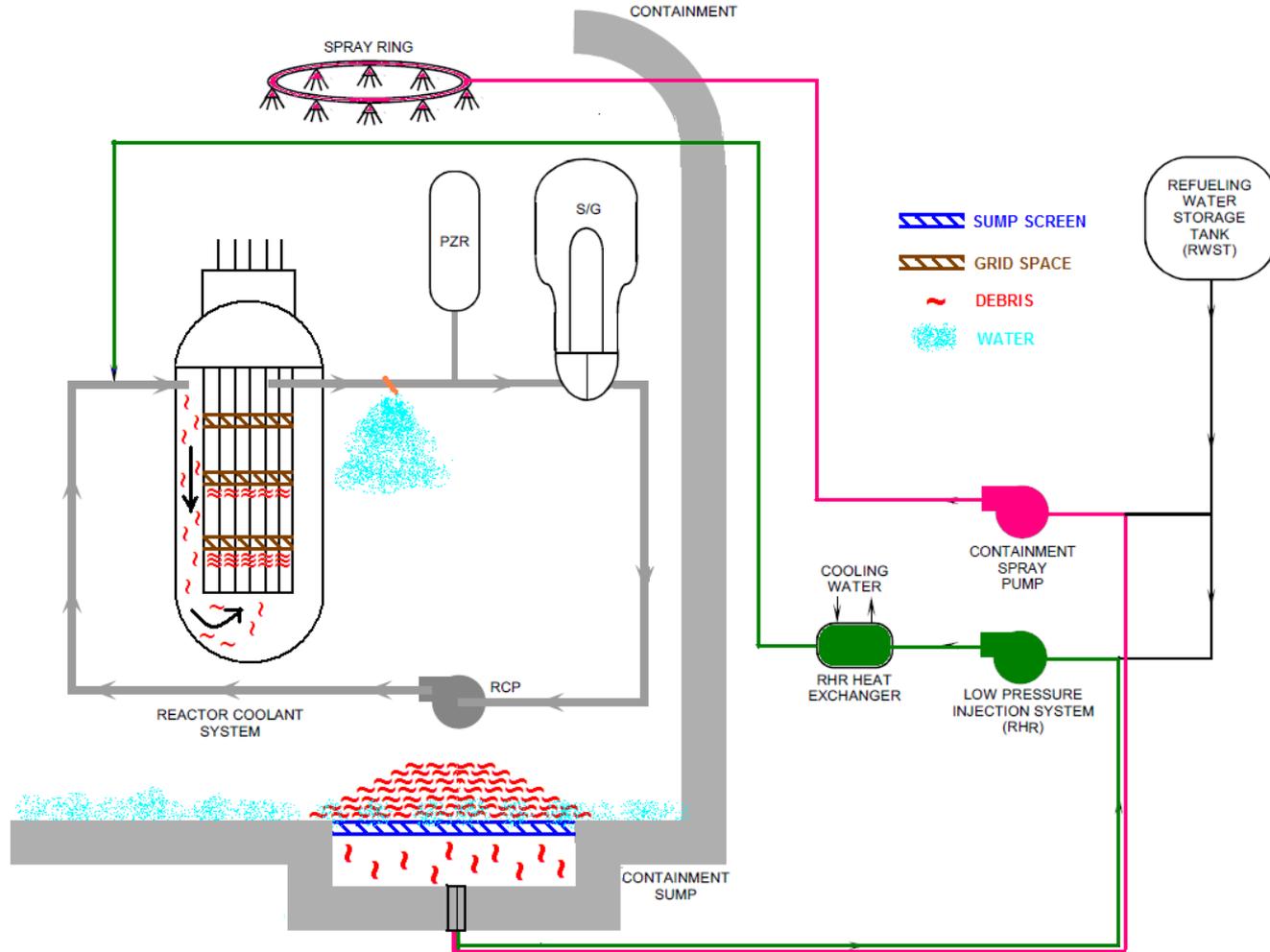
September 17, 2010, ACRS Letter

- ***In-vessel effects and sump screen performance are inextricably intertwined in determining the efficacy of long-term cooling. While it may delay ultimate resolution of GSI-191, we recommend against treatment of in-vessel effects as a separate generic issue***

Radiation Dose

- ***NEI suggests dose estimates for insulation replacement in the range of 100 – 600 person-rem with an average of 200***
- ***Current experience and more detailed estimates suggest doses will be at or below NEI's lower range***
 - ✓ ***110 person-rem to replace insulation at 2 units of Beaver Valley***
 - ✓ ***Estimated 81 person-rem per unit for large scale insulation replacement at STP***

Schematic of Long-term Recirculation System



Option 3

We recommend Option 3 not be considered

- ***Inconsistent with defense-in-depth; could permit a LOCA to disable both the system that prevents core damage (ECCS) and the system that mitigates offsite releases (containment sprays)***
- ***Does not maintain the capability to mitigate large break LOCAs contrary to Commission direction and ACRS recommendations for risk-informed changes to LOCA requirements (50.46(a))***

In-Vessel Effects

In-vessel effects should not be separated into another generic issue

- ***Sump screens and core act in concert to filter debris in the recirculation system***
- ***Large area screens may allow more flow but may allow more debris to pass through to the core***
- ***In-vessel blockage increases with increased debris loads that may pass through the screens***