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Draft Revision to the Safety Evaluation of NEI 04-07, Pressurized Water Reactor Sump Performance Evaluation Methodology

Public Meeting
October 21, 2010

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Purpose of Presentation

- Provide background for the staff's decision to pursue revision of the safety evaluation (SE)
- Summarize proposed revisions
- Discuss basis for selective applicability of scaling equation to zones of influence (ZOI)
- Discuss basis for new ZOI for aluminum RMI

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Need for SE Revision

- Jacketed insulation scaling questions raised by NRC staff during Wyle test discussions
- Staff went back to see how scaling was addressed for BWRs because PWR ZOIs are based on BWR ZOIs
- NRC staff identified that a scaling equation was used to adjust destruction pressures for all jacketed materials at BWRs
- This scaling equation was inadvertently omitted by the industry in development of NEI 04-07 and also inadvertently omitted by the NRC staff during development of its SE
- Scaling equation can have large effect on assumed destruction pressure and therefore ZOI size

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Proposed Revision

- Updates SE to include staff accepted ZOI of qualified epoxy coatings as described in March 28, 2010 guidance and related test reports
- Provides new ZOI for evaluating chemical effects potential of aluminum RMI
- Applies scaling equation for Sure-Hold banded insulations
- Provides a staff accepted debris characterization for Sure-Hold banded fibrous insulation

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Scaling Equation Applicability

- Potential applicability of scaling equation limited to jacketed insulation systems
- Scaling equation not applied to Transco or Darmet RMI because NEI 04-07 recommended 75% small foil assumption within ZOI not realistic. Generation of transportable debris, based on staff review of test data, is not sensitive to scaling equation
- Scaling equation not applied to Cal-Sil due to staff determination that failure mechanism, based on staff review of test data, is not sensitive to scaling equation
- 17D ZOI is a sufficiently large ZOI that no additional scaling is necessary for those jacketed materials that have a 17D ZOI or larger

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ZOIs for Transco RMI

- As stated previously, NEI 04-07 assumption of 75% small foils for Transco RMI over a 2D ZOI not realistic
- Actual debris observed during testing was 0.5% over much larger ZOI
- 4D using 75% small foil assumption bounds actual foils expected from largest RMI ZOI supported by testing using 0.5% small foils
- 4D proposed for aluminum RMI to account for chemical effects
- 17D proposed for large cartridges to also account for chemical effects of larger partially intact debris
- These ZOIs not proposed for Transco RMI with stainless steel foils because stainless steel RMI not a concern