Questions Associated with Loss-of-Coolant Accident (LOCA) Frequency Analysis

1. Is there an updated document since presentation in July that fully describes the LOCA frequency estimation and provides an example with the latest approach for calculating these frequencies? Please explain.
2. Can the differences between the method for calculating frequencies in the July meeting be compared to what's currently being done be summarized and rationale provided for the reason for the change? Please explain.
3. Please explain how are LOCAs due to seismic effects considered?
4. Please explain how at South Texas Project (STP, Units 1 and 2 the modeled degradation mechanisms (DMs) at each joint are comprehensive if there is no prior history of that mechanism at a piping location, or the particular piping location has never been inspected? Is this rectified with the Risk-Informed Inservice Inspection (RI-ISI) expert judgment process at each plant? Have the DMs modeled for each joint been compared with more expansive studies such as Electric Power Research Institute's (EPRIs) materials degradation matrix (MDM) and the NRC's proactive materials degradation assessment (PMDA) (i.e., NUREG/CR-6923) assessments to ensure assessment of all possible mechanisms? How do you know that certain mechanisms (i.e., thermal fatigue (TF) and vibration fatigue (VF)) can't occur at a specific location?
5. Please explain how mitigation of primary water stress corrosion cracking (PWSCC) is considered in the analysis to determine LOCA frequencies at STP, Units 1 and 2, especially for hot legs and cold legs as no mitigation methods have been identified for these systems in the information provided to date?
6. Currently, each DM at a specific piping location is combined independently to determine the LOCA frequency distribution for that weld joint location. Please explain how are the synergistic effects of multiple DMs on either the failure frequency or the conditional probability of rupture considered? For example, TF could initiate at a design and construction (D&C) flaw and possibly combine with PWSCC to accelerate the degradation rate compared to each DM rate considered independently so that the failure frequency is increased. Also, the degradation may evolve in a manner that affects the likelihood of rupture.
7. The approach for determining LOCA frequencies combines Lydell's base case results from NUREG-1829 with the distributions from all the experts. However, Lydell's estimates are part of the community of results. Doesn't this approach double-count Lydell's estimates? Please explain why is it appropriate to combine Lydell's estimates for specific DMs with the total LOCA frequency results (i.e., from all DMs) in NUREG-1829?
8. Please explain how were Lydell's estimates for multiple base cases added to form a single distribution? How were systems and DM that weren't part of Lydell's base case estimates analyzed?
9. Please more fully explain how composite LOCA frequency distributions are developed from the individual expert LOCA frequency distributions from NUREG-1829? How situations where the expert didn't provide any information for a particular system in NUREG-1829 are addressed, since the experts weren't required to assess all systems (only those that they thought were most important were assessed)?

10. Please verify that debris from vessel rupture is not considered in the GSI-191 analysis to determine plant debris sources, but is part of the general probabilistic risk assessment (PRA) modeling that is unaffected by plant changes to address GSI-191 resolution? If so, why is not considering vessel rupture as a debris source term appropriate?
11. Please more fully explain how the prior distributions in Step 4 (i.e., slide 6 in the presentation dated 8/22/11 for pre-licensing meeting) are determined?
12. Please more fully explain the differences between the worst-case percentile method and the mixture distribution method (i.e., slides 11 – 13 in presentation dated 8/22/11 for pre-licensing meeting)?