BVPS Joint HEP Discussion with NRC

- Summarize BVPS understanding of RAI
 - NRC is looking for adequate justification that the BVPS quantitative fire risk estimates exclude the impact of unrealistically low joint HEPs
- Describe BVPS approach to HRA dependency analysis
 - o Approach follows established NFPA 805 RISKMAN process
 - BVPS model did not translate full sequence results into minimal CDF/LERF cutsets
 - Demonstrate that minimal CDF/LERF cutsets and full CDF/LERF sequences produce the same result, at different levels of detail
 - Non-consequential elements of CDF/LERF sequences do not affect the total quantitative risk estimate, when quantification accounts for both failure and success terms
 - When full CDF/LERF sequences are evaluated for dependency, minimal CDF/LERF cutsets are inherently included
 - All possible combinations of HEP pairs are identified from sequences and reviewed for dependency
 - Demonstrate that accident sequence context is inherent in human action basic events (and therefore available in individual pair-wise evaluations), since actions which may be affected by accident context are actually represented by different basic events for different contexts
 - Pair-wise evaluations are then applied to the longer sequence strings of joint HEPs to determine which are potentially dependent
 - Potentially dependent joint HEPs are recorded in the dependency analyses and examined further
 - Demonstrate that BVPS FPRA models account for HEP dependency in the construction of the model
 - Specific details of BVPS model quantification
 - o Compare against 1E-05 floor
 - Conclusion is that dependent joint HEPs are above 1E-05
 - Joint HEPs below 1E-05 are specifically justified as zero-dependent
- Clarify previous RAI responses
 - o Provided full range of values for full non-minimal CDF/LERF sequence joint HEPs
 - Demonstrate that these values do not equate to minimal CDF/LERF cutset joint HEP values
 - Translate example from 2nd round RAI response into minimal CDF cutset to show what the number would be
 - Demonstrate justification of zero dependence in the resulting joint HEP
 - Discuss examples of other, dependent joint HEPs in the model