

Questions for Discussion during February 15, 2018, Nuclear Regulatory Commission Staff and Industry Meeting MRP-227, Rev. 1 Requests for Additional Information

1. Response to Request for Additional Information (RAI) 5 in part discussed functionality considerations in support of the reduced sample size for the core barrel welds. Specifically, a core barrel weld could completely fracture allowing the core to drop, and the reactor could still be safely shut down. However, MRP-191 failure modes, effects and criticality analysis (FMECA) categorizes the core barrel welds as high consequence of failure, because failure of these welds could preclude safe shutdown. Please discuss the apparent inconsistency between the RAI 5 response and the MRP-191 FMECA results.
2. RAI 5, Tables 1-3, what is the probability of detection for each crack size? How do you get >25% probability when inspecting a 25% sample with only one crack present? (Maybe provide an example of one of these calculations).
3. RAI-5, Response from the Material Reliability Program (related to the functionality of the core barrel under a faulted condition) states in part the following—Page 11 of LTR-AMLR-17-9, Rev.2:

“Testing was conducted to measure the effect of various abnormal conditions on the ability to insert the control rods and the time to scram. One of these tests investigated the effect of a full core drop type accident.

The testing performed also tested the effect of significant fuel deflections (i.e., the center of the fuel assembly was deflected laterally while the top and bottom were pinned) and determined that effect on scram time was acceptable. This provides evidence that the small ‘bend’ in the control rod insertion path that could be caused by a tilted core barrel would not have an impact on the ability to insert the control rods for core shutdown.”

The staff requests industry discuss the following:

- During the scenario addressed above, how many control rod assemblies are allowed to encounter the small “bend” in the control rod insertion path due to a tilted core barrel?
 - Is the deflection due to small “bend” observed (in the testing) in the control rod insertion path bounded by the safety margin established in a plant loss-of-coolant-accident analyses for each Combustion Engineering and Westinghouse unit?
 - Provide a brief summary on how the full core drop test was conducted.
4. The response to RAI 10, which concerns the adequacy of a 25% sample inspection of the deep beam welds, provides a markup of Table 5-2 showing the expansion to the remaining deep beam welds if cracking is found in the initial sample. The markup shows this expansion inspection must be completed by the end of the next refueling outage.

Why not require the expansion be completed during the same refueling outage during which the cracking was found in the initial sample, consistent with the approach for the core barrel welds?