

REQUEST FOR ADDITIONAL INFORMATION
RELATED TO AREVA NP, INC.
TOPICAL REPORT EMF-2103, REVISION 3
“REALISTIC LARGE BREAK LOCA METHODOLOGY FOR
PRESSURIZED WATER REACTORS”

RAI-27

Provide additional information to justify the sampling range for the [], as defined in Section 7.9.3.3.1 of EMF-2103P, Revision 3. Based on the U.S. Nuclear Regulatory Commission (NRC) staff review of the database supporting the correlation to which this parameter is applied, it would appear that the sampling range provided in the topical report should be doubled to provide better coverage of the available data.

RAI-28

Justify the approach for treating uncertainty in the []. Show that treating the [] is appropriate in light of the data used to develop []. Consider alternative statistical distributions and include goodness-of-fit analyses, and as justification for use of a [], explain why added numerical dispersion at both tails of the actual distribution introduces conservatism.

RAI-29

Provide a brief explanation of the treatment of [] for cases where the []. On what basis does AREVA conclude that this model replicates observed [] behavior?

RAI-30

Provide an explanation for the collection of [] data as documented in BAW-10227P-A. The M5 LTR appears to contain little justification or explanation concerning the concept that [], especially given that, as shown in NUREG-2160, rupture shape and size tends to be somewhat stochastic.

ENCLOSURE

RAI-31

Provide a general description of the way the fuel clad swelling model is implemented in the axial (z) direction.

RAI-32

Explain whether the same models described in the discussion about fuel rod swelling, rupture and relocation are the same as those used to [

]. This discussion could be well informed with a cartoon of the model as implemented for a severely strained section of fuel.

Please address the following NRC staff comments regarding your response to RAI 21:

- There remains a gap between the output of the method proposed by AREVA and the NRC staff's interpretation of what the regulation requires. Specifically, the statistical method [], which may comply with the joint 95/95 standard. However, this [] AREVA separately intends to provide [], but these do not appear to be 95/95 values and it is not clear what they represent statistically. This dichotomy has not been reconciled in the response and it underlies the majority of the concerns held by the NRC staff regarding the statistical methodology.
- The language regarding when a reanalysis would be necessary remains vague and AREVA's recommendation appears inconsistent with the regulatory threshold defined in Title 10 of the *Code of Federal Regulations* Part 50.46 (10 CFR 50.46).
- The responses do not appear to make a clear distinction as to what is legally required and how it is satisfied as opposed to what AREVA's policy would be. In some cases, the responses appear to pass responsibility to a choice of the licensee. But the issue here is that the regulation has reporting requirements, which the utility must meet – there is no choice involved and neither is AREVA a disinterested party. The role of the topical report and associated safety evaluation should be to provide a clear interpretation of the regulatory requirements so that the licensee can fulfill its regulatory obligation. Ultimately, it appears that AREVA is proposing reporting requirements that are based on values that do not appear to meet the 95/95 standard and aren't necessarily satisfying any clear statistical standard.

Please address the following NRC staff comments regarding your response to RAI 22:

- It appears, in general, that the conservative assumptions that may be relaxed are plant parameters that are, in essence, constraints on operation that must be satisfied for the analysis to be valid. Exceptions are noted with regard to [

]. The NRC staff needs to have its understanding confirmed, especially concerning [], and the process AREVA believes it would be in when making such changes to the evaluation method.

- The response discusses an option for [] A couple of issues with this statement. First, no criteria are given as to how [] is defined. Second, allowing the analyst the option to [] introduces selection bias. Third, no specific [] was identified. As a result, it appears that the ostensible 95/95 standard would be unattainable via the proposed process. It is further not clear what AREVA means in discussing [] For example, if we are considering a []? And, if a number of values [], in what sense is it reasonable to consider []? Alternately, if the [] is defined based on the [], then why should this approach be justified, as the []? Recall that we are sampling from an unknown distribution and considering a small subset of the sampled data; determination of what is and what is not [] is very much open to subjective interpretation.

Please address the following NRC staff comments regarding your response to RAI 23:

- “[].” AREVA needs to discuss further to ensure common understanding. What the customer requests appears somewhat extraneous in that an acceptable method should specify controls that preclude customer requests from violating either the physical or statistical integrity of the method. This is exactly what the RAI was seeking to establish, regardless of the origin of the change request.
- Clarify what is meant by “intermediate calculations.” It appears to be calculations that were intended to be final calculations, but which were subsequently revised further and hence ended up not being the final analysis. Understand the documentation that will be provided in plant-specific submittals in this regard. A reviewer should be able to determine the number of intermediate iterations and gauge whether changes made to inputs for intermediate calculations were substantive and carried a legitimate *a priori* expectation of success. Unlike Appendix K, the integrity of the process is important, rather than just the final analysis of record.
- Not clear why “[].” Again, the potential for selection bias is introduced – note in particular, the response says “can... only” and not “must.” Also, the linkage between the [] cannot be understood. As such, the option (or even if it were specified as a

requirement) for choosing [] seems a disconnected and unnecessary complexity.

- The statement to be added to Appendix A appears narrow and may not adequately capture all concerns regarding statistical fidelity raised by the NRC staff.