

NRC comments on NEI white paper for crediting FLEX in RIDM

Note: These comments do not represent an Agency position and in many cases are the opinion of one individual staff member. The comments contained in the Attachment will be used to guide internal discussions to establish agency positions in the areas of interest. This list consists of 134 regional and headquarters individual staff comments consolidated into 53 binned comments.

Binned Comment	Comment Summary
1	There is no, or not an adequate, technical basis provided to use a baseline HEP of 0.1.
2	The validation using NEI 12-06 Appendix E for purposes of meeting the order is not necessarily sufficient for establishing credit for other regulatory applications.
3	What is the basis for the 90 day unavailability?
4	There is a lack of testing/reliability information and associated human actions performance data for FLEX equipment making it difficult to ascertain proper credit.
5	The white papers omit the diagnosis element essential in a successful strategy.
6	The Performance Shaping Factor (PSF) information provided in the white papers are not specific enough, adequate, or in some cases reduce the failure probability inappropriately.
7	How will you account for non-operator performed actions with regard to training?
8	General comment stating more study, information is needed to credit FLEX appropriately (without more specific detail).
9	The NEI white papers are not sufficiently detailed to provide adequate guidance.

10	Would crediting the FLEX equipment invalidate the initial conditions and assumptions of the PRA model?
11	How do you deal with staging FLEX equipment outside of its protected environment?
12	We do not have sufficient understanding of the beyond design basis events to model them and provide subsequent credit for FLEX equipment.
13	The change in risk due to FLEX equipment/strategies has not been fully evaluated, including any possible increase in risk on specific scenarios. The models will need to be adjusted to properly account for FLEX equipment (i.e. ELAP scenario, DC load shedding unavailability of certain equipment). Only then can appropriate decisions be made on the change in the overall risk profile to the plant.
14	No technical justification was provided for the simplified equipment availability and reliability model used (N equipment P = 0.1, N+1 P = 0.01).
15	What is considered "safe and stable" when using FLEX equipment/strategies?
16	Feasibility assessment criteria is missing or inadequate.
17	The papers do not provide adequate guidance on qualitative analysis (i.e. scenario, staffing, task).
18	There is no commitment to detailed written procedure (i.e. EOPs) development or operator training to support the relatively high success probabilities proposed.
19	Better clarification of which groups (permanently installed, on-site portable, permanently staged, off-site portable) of equipment are within the scope of white papers is needed.
20	Additional evaluation is required regarding assumption that adverse environmental conditions are random and have no dependency on the event requiring FLEX deployment.
21	In risk-informed applications for making changes to a licensing basis, external hazards typically need to be analyzed although the environmental condition cannot be anticipated. It is likely that adverse environmental conditions exist for those scenarios that take credit for FLEX capabilities and the PRA model should assume a high dependency between adverse conditions and the demand for FLEX capabilities for those conditions.
22	The unreliability discussion does not account for common cause failure.

23	Requirements for crediting FLEX are application specific. The guidance may need to be incorporated in specific program documents (i.e. RASP manual for SDP).
24	Explanation of the intentions, relationships, and interactions between these two white papers needs to be presented.
25	Meeting the order does not immediately translate into an effective program that can be credited in other regulatory applications.
26	Path forward should be similar to what was done for the acceptance of industry RISC WG action plans (potential pilot of the approaches for various proposed applications, the industry obtains staff review/feedback on a draft guidance document, finalize the guidance addressing any staff comments, and obtain ultimate endorsement of the guidance).
27	The papers have reference to "other equipment" or "other functions" (or similar language) that "may need further evaluation to determine if use is appropriate", this may expand the scope of the documents inappropriately, more information is needed as to what these statements mean.
28	The potential for adverse system interactions needs to be evaluated when assessing the strategy (i.e. potential for significant water hammer due to high feed rates on a dry S/G), this is not present in the white papers.
29	The "Scenario Assessment" step, and "Equipment Capability Evaluation" in the qualitative approach may sometimes require engineering analysis. This seems counter to a qualitative approach and represents an expansion into a more quantitative approach that is not consistent with its purpose. If retained, there should be some guidance on acceptable analytical tools and analysis methods and level of quality assurance expected for those aspects that expand into quantitative arenas.
30	It appears that not all equipment required for the FLEX strategy is covered in the qualitative approach (i.e. equipment needed to refill CST).
31	A simpler and more realistic approach is needed with full integration into licensee PRAs expeditiously pursued.
32	It is recommended to limit application of credit to SDP initially until issues are well understood.
33	It is recommended that credit for FLEX equipment is withheld until TI-191 inspections are complete.

34	Recommendation to use 0.1 as the maximum risk credit, with adjustments reflecting the adequacy of procedural guidance and equipment availability. Credit should only be applied to those initiating events and associated dominant sequences, on a cutset by cutset basis, where sufficient time (time margin) and environmental (weather) conditions permit.
35	Without incorporating the flex capabilities in the base model, the licensee gets to reap the risk reduction benefits, post processing, without having to absorb any of the risk consequences for failed or degraded flex equipment.
36	This will not improve SDP timeliness or predictability, since each event will have to be manually scrubbed to prescribe the appropriate credit.
37	Alternate approach as specified by Region 1.
38	The SDP and NOED processes are not licensee processes, but rather NRC processes. The NRC will determine appropriate credit and in the case of SDP will perform an independent assessment. SDP and NOED should be removed from the scope of these documents.
39	Currently SDP and NOED do not have a provision for using qualitative risk assessment in lieu of quantitative risk assessment.
40	No credit should be allowed for portable equipment that is housed in an offsite location (i.e. at regional response center).
41	Initial feasibility assessment needs to be done up-front before the data will be required for use in SDP, NOED, etc.
42	For qualitative assessment, clarify what is meant by "reactivity control" and "containment functions".
43	Will the monitoring program provide unavailability data?
44	Pre-deployment, pre-staging, hauling, and debris removal are unlikely to be factors in internal event and fire modeling, which will likely be the main scenarios of interest.
45	Currently an ELAP is the only procedurally driven way to get into the FSGs. What mechanism will direct the operators to use the FLEX equipment?
46	Pre-deployment may help with maintenance risk assessment or NOED but should be excluded for SDP, as conditions were not previously known and equipment was not pre-deployed.

47	Recommend using "modeling" instead of "crediting" throughout the white papers.
48	Phase 1, 2, 3 is not terminology used in PRA, suggest not referencing it here.
49	Unclear as to what the following statement means: "Ancillary actions required for implementation of the Phase 2 equipment must be deemed feasible as part of the assessment. Their failure probabilities, however, are implicitly included in the bounding approach provided below."
50	PSAM paper vs. white paper differences: Texe is included in base HEP, vice referenced PSAM paper which says it is not assessed by the methodology, paper also suggests that deployment not be credited when flood conditions exist in the zone where the activity is required, vice allowing for credit in white paper when plant procedures address condition.
51	Based on a review of the CDF cutsets, the dominant contributors to the increase in risk involve SBO sequences which lead to core damage after initial battery depletion. (This statement is suspect as several SPAR model runs on a variety of plants show different dominant contributors.)
52	Example does not comport with reality: HPCI failure probability for 24 hour mission time in Monticello SPAR model is 7.5E-2. So FLEX is more reliable than HPCI? A single EDG has a failure probability for a 24 hour mission time on the order of E-2, so FLEX is on par with EDG reliability?
53	We should have a hard tie that requires maintenance of FLEX equipment in accordance with the NEI guidance at a minimum.