#	Source	Comment	Remarks
1	R2	Under the "Consideration of alternate mitigating strategies" guidance in section 6.4, please consider deleting the first bullet in its entirety. This bullet requires that any modeling changes to credit FLEX must meet the requirements of the Probabilistic Risk Assessment (PRA) standards. The Significance Determination Process (SDP) analyses are frequently performed as a series of screening analyses, using assumptions that could not be justified under the PRA standard. The PRA standard's primary function is its use to construct PRA models and certify them for use. The SDP provides risk insights for use in the Reactor Oversite Process, and is not required to meet the PRA standard. This is important when FLEX is considered in the SDP. The FLEX equipment is used very late in any accident timeline. Because of the extreme conditions being modeled, and the high uncertainties in the assumptions, it is unlikely that the inputs can meet the PRA standard. The second bullet contains enough descriptions of items for consideration to allow the analyst to perform an SDP that gives the appropriate credit for FLEX.	Removed the reference to RG 1.200 and reformatted the paragraphs.
2	R3	Section 6.4 states: Nuclear Energy Institute's FRIDM (FLEX in Risk-Informed Decision Making) Task Force developed guidelines for the industry to follow when requesting credit for alternate mitigating strategies. This guidance is contained in two white papers, "Qualitative Assessment for Crediting Portable Equipment in Risk-Informed Decision Making," (ADAMS Accession No. ML16138A018), and "Streamlined Approach for Crediting Portable Equipment in Risk-Informed Decision Making," (ADAMS Accession No. ML16138A017). Although the NRC has not endorsed this guidance, a letter from the NRR Office Director was	Added reference to NEI 16-06.

		issued (ADAMS Accession No. ML16167A034), which captured NRC staff's views on the white papers. This paragraph should also reference appropriately NEI 16-06 (Rev 0, August 2016), "Crediting Mitigating Strategies in Risk-Informed Decision Making." This NEI document incorporates the guidance from the two white papers mentioned.	
3	R3	Suggest moving the references to the NEI documents out of the main body of the manual and into a "list of references". Since the RASP manual is used for NRC evaluations it is confusing to have industry guidance that has not been endorsed in the main body of the document. The SRAs need to be aware that the industry guidance exists but should not be using it to perform risk evaluations.	Added clarification to the paragraph on the purpose of identifying the references. APHB feels it's important to have these references in the most likely place the analyst will look for information on how to credit FLEX equipment.
4	R3	Section 6.4 "Consideration of alternate mitigating strategies". Please add the following bullets under, "Consideration for incorporating these strategies and equipment include but are not limited to:"	Each individual bullet addressed below.
4a	R3	The impact on plant SSCs or PRA recoveries as a result of ELAP declaration at 1 hour or less into an SBO event, notably deep DC load shed. This includes any impact to offsite power recovery and EDG recovery.	Added the following language to section 6.3 "Using Data to Estimate Non-Recovery Probabilities" A decision or procedural direction to deep DC load shed early in some events (e.g. SBO) may complicate recovery of off-site power or emergency diesel generators, this should be taken into consideration by the analyst when estimating non-recovery probabilities.
4b	R3	The impact to the operation of steam-driven systems such as HPCI/RCIC once an ELAP has been declared. This may include additional operator actions to maintain level to avoid filling the steam lines when the high level trip has been disabled and the system is operated in a much wider level band.	Added the following language to section 6.4 under "consideration of support system availabilities" Availability of support systems may need to be verified multiple times during events (e.g. initially upon SBO and once ELAP has been declared) to account for changes in support system availability. Additional complications from loss of support systems (e.g. additional operator actions to maintain level to avoid filling steam lines with high level trips disabled and wider level bands) should be considered under

			the appropriate section of this manual (e.g., section 9.0 for new human failure events).
4c	R3	The potential decrease in the reliability of the RCIC system when operating at very high suppression pool temperatures.	Section 3.0 covers failure modeling and deals with degraded failures and incipient failures, both of which may be applicable depending on the situation. There are multiple examples provided in that section. No additional changes were made.
4d	R3	The dependency between the human error probabilities for the use of existing alternate injection strategies (e.g., installed diesel-driven fire pump) and the use of portable equipment.	Section 6.4 has an existing discussion of HFE dependencies: ***Consideration of dependencies among multiple human actions in a cut set***. Particular attention should be paid to accounting for dependencies among the HFEs including the credited recovery/repair actions. Considerations from NUREG-1792 include: – Dependencies should be assessed: ○ Among multiple recoveries in the accident sequence/cut set being evaluated ○ Between each recovery and the other HFEs in the sequence/cut set being evaluated – As part of this effort, the analyst should give proper consideration to the difficulties people often have in overcoming an initial mindset, despite new evidence. For example, consider how long the power-operated relief valve path remained open in the Three Mile Island accident, despite new cues of the problem, different personnel arriving, etc. – The determination of whether there is dependence between HFEs and the level of dependence (if there is dependence) needs to be adequately justified and documented to ensure that credit for the recovery action(s) is appropriate. Refer to Section 9.3 for further information on dependence. No additional changes were made.
4e	R3	The dependency between the human error probabilities for the use of existing non-safety related diesel generators (such as supplemental diesel generators, or the TSC diesel generator) and the portable FLEX diesel generators.	See answer to 4d.

4f	R3	The risk decrease associated with the installation of low leakage RCP seals in PWRs.	INL and RES are currently developing the model for low leakage seals and it will be applied to models for plants that have them installed. No additional changes made.
4g	R3	The impact of hardened containment vent modifications and revised strategies for early containment venting on both core damage and large early release.	This is something we need to deal with overall in the FLEX project, but would not belong in the "modeling recovery and repair" section. As with the shutdown seals, we need to work with INL and RES to get this incorporated into the SPAR models. No additional changes made.
4h	R3	Flex strategies should generally only be considered as a "single train" because multiple single point failures exist (hoses, cables, connections, etc.) even if multiple generators or pumps are available. Additionally if the installation of one portable diesel generator is not successful, there is not likely enough time prior to core damage for the installation of the second portable diesel generator.	Added language to section 6.4 for multiple recovery actions: – Multiple recovery/repair actions in a cut set should be checked to determine whether such credit is reasonable based on available time and staffing. For example, consider that one recovery may be tried (perhaps even multiple times) and then the second recovery may be tried but with even less time and resources available because of the attempts on the first recovery. Hence, the failure probability of the second and any subsequent recovery actions should be based on more pessimistic characteristics (e.g., less time available, less resources) than if such a possibility is not considered. The possibility of single point failures impacting a recovery event should also be considered (e.g., having multiple FLEX high pressure injection pumps available would not yield a credible recovery event in the event of a failure of the suction hose (with no available spare) that is common to all pumps.
4i	R3	Equipment reliability must be considered. If FLEX is not maintained and tested similar to existing equipment modeled in the PRA, the existing failure probability and unavailability data used for PRA basic events should not be used.	"Reliability of associated equipment" bullet was revised to "Reliability of associated equipment considering frequency of maintenance and testing intervals"
5	R3	Terminology – The document seems to use the terms "mitigating strategy" "alternate mitigating strategy" and "FLEX" interchangeably. We suggest choosing one term and using it throughout to avoid confusion.	Removed the term "mitigating strategy" and replaced with "alternate mitigating strategy" where appropriate in the document. The term FLEX is used in the document to give an example of an alternate mitigating strategy.
6	R3	General comment – FLEX has significantly changed plant response to SBO events. The modeling guidance in this section will increase the work necessary to conducted detailed risk evaluations for the SDP, as SRAs will now need to consider the "FLEX" impact for	APHB agrees that the incorporation of FLEX will cause more work for analysts when performing risk assessments until the associated SPAR models are updated to reflect the as built as operated plant. APHB is exploring additional ways we can help the SRAs to accurately and consistently provide credit for FLEX.

		many findings. FLEX capability and procedures have not been reviewed against the scenarios modeled in the internal events PRA. Licensee compliance efforts and NRC inspections were focused on compliance with the Order, which only considered external events and established boundary conditions that may be very different from the internal events core damage sequences that are evaluated in SDP, MD8.3, NOED, etc. The SRAs, with inspector assistance, will be required to perform a substantial amount of additional work for many findings to conduct a review for the plant impacts. This direction is not consistent with the current emphasis on timeliness and meeting the new 120 day metric provided in IMC 0609. We suggest further efforts to update SPAR models and continued efforts to improve the RASP manual with more detailed guidance than is currently being provided.	
7	RES	Note that some of the FLEX strategies may not be recovery actions per the PRA Standard definition. The classification of these as recovery actions could lead to inconsistency of whether or not these strategies should be modeled in the base case for condition assessments.	Guidance is given later in the section pertaining to where the strategies should be modeled. "Credit for alternate mitigating strategies must be included in both the baseline risk assessment and the assessment of the performance deficiency, unless the action would only apply for the latter event. For example, if equipment is available that could reduce the risk; the analyst should consider whether the equipment could also be used for scenarios in the baseline model. Otherwise crediting the equipment in the SDP but not the base model would result in a smaller estimate of the risk increase than is realistic. For more information about where to model alternate mitigating strategies in the PRA, see section 6.5."
8	RES	In reference to the table with potential recovery actions: I would think that FLEX could potentially be credited for all of these failure cases (except the operator diagnosis failure); therefore, I am not sure why it is highlighted in these specific cases only. The main concern would be how many recoveries/strategies are we going to credit. And are we essentially choosing what provides the most potential credit and if this would lead to the assumption that operators will always make the correct choice. (This could be rendered moot if there are	The table gives examples of failure events and potential recovery actions. These are merely suggestions for the analyst to consider and not an all-inclusive list of events and examples.

		explicit direction in their EOPs or other procedures to initiate FLEX).	
9	RES	Added text – Failure to recover the less problematic diesel would most likely lead plant staff to focus on alternate mitigating strategies (e.g. FLEX, deployment of additional portable equipment). These actions should be evaluated as multiple recovery/repair actions as indicated below. Comment – This could be an issue because we may be determining the hardware that is more problematic using the information operators probably wouldn't have at the time. If there are enough staff to cover both activities; that is fine.	The analyst should be able to use engineering or operational judgement on what the operators would have known at the time of the event and use this in informing the risk analysis. Since SDP, ASP and MD 8.3 analyses are backward looking, the analyst can use the event timeline to evaluate the recovery.
10	RES	Added text – Considerations for incorporating these strategies and equipment include but are not limited to: Comment – Is information on all these aspects needed to provide credit?	It is not an all-inclusive list, but considerations for the analyst.
11	RES	I am not sure what the purpose is for referencing the NEI white papers and how analysts are to treat the guidance within these reports. J.Nakoski - I agree, without putting the NEI white papers into context, it seems that the staff is being directed to follow the guidance provided in the NEI white papers. This needs to be clarified.	Added clarification to the paragraph on the purpose of identifying the references. APHB feels it's important to have these references in the most likely place the analyst will look for information on how to credit FLEX equipment.
12	RES	Added text – Staffing levels and availability of personnel for performing actions associated with the strategy Comment – Does that staffing need to be available 24x7 during the entire exposure period?	If the strategy requires 24x7 coverage, yes.