

The ISO received comments on the topics discussed at the September 26, 2022 stakeholder call from the following:

- a. California Wind Energy Association
- b. Pacific Gas & Electric
- c. Rev Renewables
- d. San Diego Gas & Electric
- e. Southern California Edison

Copies of the comments submitted are located on the Planning Standards – Remedial Action Scheme Guideline Update stakeholder initiative page at:

<https://stakeholdercenter.caiso.com/Comments/AllComments/c36dd6bb-4e13-48d2-99ba-ab7f14137591>

The following are the ISO’s responses to the comments to the following:

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1. Please provide a summary of your organization's comments on the Planning Standards - Remedial Action Scheme (RAS) Guidelines Update straw proposal and September 26, 2022 stakeholder call discussion:			
No	Submitting Organization	Comment Submitted	CAISO Response
1a	California Wind Energy Association	CalWEA generally supports CAISO's efforts simplifying the RAS design. However, the proposal guidelines could have significant impacts on the generation projects currently in the interconnection queue, in terms of the network upgrade requirements, the cost of both network upgrades and interconnection facilities, the timeline for interconnection, and the deliverability. CalWEA urges CAISO to fully investigate the impacts before moving forward with the proposal and provide the evaluation to the stakeholders.	The comment has been noted.
1b	Pacific Gas & Electric	<p>PG&E appreciates the opportunity to provide its perspectives on the straw proposal and looks forward to working with the CAISO and other stakeholders through the Planning Standards - Remedial Action Scheme (RAS) Guidelines Update.</p> <p>In general, PG&E believes additional clarity in the proposal is necessary and that the RAS guidelines should attempt to keep RAS local to radial/semi-radial facilities and away from network flows which are difficult to predict.</p> <p>PG&E also has the following question about the proposal and requests it be addressed in the revised straw proposal:</p> <ul style="list-style-type: none"> • Is generator auxiliary load/station service able to be tripped as part of a RAS? <p>If so, this could affect the generator tripping mechanism. Tripping locations could become important if auxiliary load/station service cannot be tripped. In general, PG&E recommends avoiding tripping auxiliary load/station service. Please see below additional comments</p>	<p>The comment has been noted.</p> <p>The CAISO agrees with PG&E and recommends avoiding tripping Auxiliary load/station service. Development of the RAS is a joint effort between multiple entities which include the Transmission Owners, Generator Owners (as applicable), and the ISO (as Planning Coordinator and Reliability Coordinator).</p>
1c	Rev Renewables	REV Renewables (REV) appreciates ISO's consideration to keep the scope of the work technology neutral in this latest proposal. We are generally supportive of the latest CAISO proposal. However, REV requests more explanation on CAISO's thinking behind items such as the proposal to use ten percent effectiveness factors. In addition, REV would also like to request CAISO on providing implementation level details	The new standards would be applied going forward in future planning and interconnection processes. Existing RAS will be managed with the tools available and with some refinements to existing functionality. Phasing out of existing RAS will occur through the annual transmission planning process on a case by case basis to meet reliability and state policy requirements.



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		including potential timelines (e.g. Cluster 14 Phase 2, 2023-24 TPP, etc.) for the proposal. Further details around the expected potential impacts to the existing RAS or future RAS proposals identified in the latest TPP/GIP studies will be quite helpful as well.	
1d	San Diego Gas & Electric	None	
1e	Southern California Edison	In general, SCE is supportive of the direction to simplify RAS design while preserving reliability and harmonizing with the ISO market. SCE provides the below comments for CAISO consideration and clarification.	The comment has been noted.



2. Provide your organization’s comments on the removal of redundant language in the RAS guidelines, as discussed in section 3.1:

No	Submitting Organization	Comment Submitted	CAISO Response
2a	California Wind Energy Association	CalWEA supports the proposal.	The comment has been noted.
2b	Pacific Gas & Electric	PG&E has no comments at this time.	
2c	Rev Renewables	REV has no comment at this time.	
2d	San Diego Gas & Electric	SDG&E agrees with the removal of redundant language in the RAS guidelines.	The comment has been noted.
2e	Southern California Edison	SCE supports the proposed removal of redundant RAS language due to the incorporation of the NERC PRC-012 standard.	The comment has been noted.

3. Provide your organization’s comments on the proposed updates to the RAS guidelines, as described in section 3.2:

No	Submitting Organization	Comment Submitted	CAISO Response
3a	California Wind Energy Association	<p>CalWEA is concerned about the implementation of the proposed guidelines on both the existing RAS and the new RAS identified in the generation interconnection process. Please clarify how the RAS designs would have to change if not compliant with the proposal. If CAISO is going to grandfather RAS designs already in place, please specify which ones will get such treatment. In addition, CalWEA has the following specific comments.</p> <p>G-RAS3.A and G-RAS4.G are overlapping and may be reconciled into one. Dynamically arming and tripping could be allowed if it is fully automatic and completely mitigates reliability concerns such that the contingency conditions triggering the RAS need don't need to be monitored in market operations.</p> <p>Using the PMAX to set tripping amount in G-RAS6 is too restrictive and compromises the effectiveness of the RAS. As long as the RAS is fully automatic and completely mitigates the reliability concerns, it could trip actual generation up to 1150 MW or 1400 MW.</p> <p>G-RAS4.E is limiting the overloading facilities monitored by a RAS to no more than 1 substation beyond the first point of interconnection. This is too restrictive and not necessary since G-RAS3.B sets the threshold for effectiveness of the generator tripping.</p> <p>As a 10% effectiveness threshold is set in G-RAS3.B, CAISO should consider applying the same threshold in the generation interconnection process for assigning RAS cost responsibility. CAISO should standardize the cost treatment of bridge RAS in G-RAS7. As the cost treatment may belong to a different stakeholder initiative, CAISO should clarify the current practice and open the topic to future stakeholder comments and enhancements.</p>	<p>The new standards would be applied going forward in future planning and interconnection process. Existing RAS will be managed with the tools available and with some refinements to existing functionality. Phasing out of existing RAS will occur through the annual transmission planning process on a case by case basis to meet reliability and state policy requirements.</p> <p>With the growth of clean generation resources it is unlikely that a RAS that completely mitigates a current problem would continue to mitigate the problem going forward, or during planned outage conditions.</p> <p>This is an existing guideline. Relaxing existing guidelines is counter to the objective of this initiative.</p> <p>See response to 4c.</p> <p>The comment is noted.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
3b	Pacific Gas & Electric	<p>ISO G-RAS3 In the proposal for ISO G-RAS3, the CAISO recommends that “RAS should trip load and/or resources that have effectiveness factors greater than 10% on the constraints that need mitigation.” PG&E believes a 10% dfax is too low and should be between 25%-50% to include projects that are more effective.</p> <p>ISO G-RAS4 In ISO G-RAS4 Section A, the CAISO proposes that “RAS should have no more than 6 contingencies”. PG&E believes 6 contingencies are too many given this proposal conflicts with monitoring less than 4 elements in ISO G-RAS4, Section B (see below).</p> <p>In ISO G-RAS4 Section B, the CAISO recommends that “RAS should not be monitoring more than 4 elements.” PG&E requests the CAISO define what is an element. For example, outage detection could need to monitor up to four (4) circuit breakers for one branch outage. Would this count as one element or four elements?</p> <p>In ISO G-RAS4 Section E, the CAISO proposes that “RAS should only monitor overloading facilities no more than 1 substation beyond the first point of interconnection.” PG&E supports the concept of proposing simple and local RAS. However, as it is written, it appears to focus more on interconnection projects and there could be conditions that a RAS would be necessary other than interconnection projects. Thus, PG&E recommends more general language be used.</p> <p>In ISO G-RAS4 Section G, the CAISO proposal states “RAS should not include logics to...” PG&E recommends the verbiage be modified to “RAS should strive to not include...” because there could be situations that necessitate its inclusion. PG&E also believes there is a typographical error in the second</p>	<p>With the RAS guideline to only monitor facilities one bus away it is expected that the effectiveness will generally be higher than 25%, so the 10% is more of a backstop guideline.</p> <p>Again, the objective is to strive to meet all of the guidelines, so meeting the 4 monitored elements guideline will likely govern the complexity of future RAS. The 6 contingency limit would be more of a backstop guideline.</p> <p>The ISO has typically been interpreting an element to be a transmission facility such as a line or transformer.</p> <p>This guideline could be modified to the following to address PG&E’s comments here: “The RAS should only monitor overloading facilities no more than 1 substation beyond the first point of interconnection for generating facility, or the first point of load interconnection”.</p> <p>The CAISO will consider PG&E’s recommendation on the suggested verbiage in lieu of “RAS should not include logics to...” guideline language. However, it is noted that the original language was crafted based on the inputs received internally from ISO Market technology team.</p>

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		<p>paragraph where it refers to “above RAS standard” since G-RAS4 is a guideline. ISO G-RAS6</p> <p>In ISO G-RAS6, the straw proposal quotes the guideline (originally ISO SPS3) and proposes to maintain it as a guideline due to retirement outlook for Diablo Canyon Power Plant (DCPP) remains fluid at this time. It is unclear what the P2 generation tripping limit is since P2 was not listed. PG&E requests the CAISO in the revised straw proposal include what the P2 tripping limit is.</p> <p>ISO G-RAS7 If G-RAS7 is intended as a temporary “bridge” until system reinforcements are placed into service, then PG&E recommends language be included in the guideline to enforce the long-term plan. In other words, a temporary RAS is allowed for bridging when there is commitment for a long-term plan. There should be a time limit for temporary RAS.sufficiency of each existing and planned SPS for the TPP study year.</p>	<p>The CAISO will include generation tripping limit for P2 contingency. Since P2 contingency is categorized as single contingency, it will have the same generation tripping limit as P1 contingency (i.e., 1150 MW).</p> <p>The CAISO will consider PG&E’s suggested comments to include language in the G-RAS7 for the use of RAS as a temporary “bridge” provided that there is a long-term transmission plan that is under consideration and evaluation.</p> <p>When a transmission project is approved by the ISO an in-service date is specified. That in-service date would be the time limit.</p>
3c	Rev Renewables	REV has no comment at this time.	
3d	San Diego Gas & Electric	<ul style="list-style-type: none"> • In response to G-RAS3, SDG&E disagrees that resource optimization should only be a guideline. SDG&E believes this should be included as a standard (S-RAS) and apply to any New RAS that is proposed. • In response to G-RAS4, SDG&E disagrees that the design of each RAS to be simple and manageable should only be a guideline. Such specific requirements to the design of a RAS should be part of a standard and adhered to. SDG&E believes this should be included in the standard (S-RAS) and apply to any New RAS that is proposed. • SDG&E would also like to see the acceptable amount of monitored contingencies (P1-P7) reduced from 6 down to 4, which would coincide with the allowable number of system elements. 	<p>The design and operation of RAS is extremely complex. Anticipating all those possible complexities and ensuring that labeling the proposed guidelines as standards is appropriate for all possible complexities is not feasible at this time.</p> <p>See response to 3b.</p>

No	Submitting Organization	Comment Submitted	CAISO Response
		<ul style="list-style-type: none"> In response to G-RAS6, SDG&E disagrees that the design of each RAS to trip either 1150MW (P1) or 1400MW (P3-P7) should only be a guideline. Such specific requirements to the design of a RAS should be part of a standard and adhered to for all Newly Proposed RAS. <p>While it is possible that these changes may affect existing RAS, these may be mitigated by grandfather exemptions for existing RAS and only applying these to RAS moving forward</p>	See response above
3e	Southern California Edison	<p>SCE agrees with establishing a minimum effectiveness factor guideline, though would prefer to see this above 10%. This is particularly important when coupled with the guidelines to arm the full capability of a facility (ISO G-RAS6) and not dynamically arm generation (ISO G-RAS4.G). Adding generation with very low effectiveness will quickly count against the 1150/1400 MW trip limits while providing minimal benefit on a thermal overload.</p> <p>Another possible downside to keeping a RAS simple and manageable is where that simplification of RAS leads to additional complications elsewhere. ISO G-RAS3 dictates that RAS should not have a complex design that is conditioned on different flow levels, yet this would impede designing a RAS that can adapt to system conditions, such as planned outages. Due to the challenges in operating around RAS action while needing to take such outages, SCE has been adding this functionality to reduce the need for manual operator intervention. Making the RAS more manageable for the ISO market makes it less manageable for operators. Another potential negative consequence of this guideline would be to trip more resources than required, which is detrimental to system reliability</p> <p>ISO G-RAS3 states that Involuntary load tripping should not be included in RAS for high density load area(s), but it does not clarify which types of contingencies are in-scope. While SCE agrees that this is highly undesirable, it may make sense as either an interim bridging mitigation, or as a mitigation for a</p>	<p>Footnote 3 in the straw proposal specifies that the most effective generation should be selected to be tripped by the RAS. This will ensure that deliverability and feasible congestion benefits are maximized within the tripping limits.</p> <p>For purposes of temporary planned outages, the RAS guidelines would not prohibit PTOs from temporarily utilizing more complex RAS features.</p> <p>The ISO believes as long as the RAS stays within the RAS tripping limits it will not be detrimental to system reliability.</p> <p>The RAS guidelines primarily apply to only P1-P7 contingencies. Extreme events are not addressed by the guidelines.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		particularly low probability/high impact event and system infrastructure upgrades are prohibitively expensive.	ISO G-RAS7 in the straw proposal allows for relaxation of the RAS guidelines as an interim bridging mechanism.

4. Are the proposed planning guideline updates sufficiently clear for understanding? If not, which specific proposed guidelines or standards would need further clarifications?

No	Submitting Organization	Comment Submitted	CAISO Response
4a	California Wind Energy Association	Please refer to comments in No. 3.	Please see response to 3a.
4b	Pacific Gas & Electric	Please see above comments.	
4c	Rev Renewables	REV requests that CAISO provide the rationale behind choosing 10% effectiveness factor. Also whether CAISO is planning to use the 10% cutoff for RAS cost allocation purposes in the interconnection process.	<p>Tripping generation with an effectiveness factor of less than 10% would require excessive quantities of generation tripping in order to mitigate the identified transmission overload.</p> <p>All generation behind the constraint would benefit from the RAS. Typically a 5% cutoff has been utilized to allocate costs for transmission upgrades in the interconnection process.</p>
4d	San Diego Gas & Electric	While SDG&E disagrees with certain entries into the G-RAS, the guidelines as laid out are sufficiently clear. (See comments above)	The comment has been noted.
4e	Southern California Edison	<p>SCE believes the proposed guidelines are generally clear, though would like to point out a few specific areas that could cause confusion, and requests the CAISO provide clarifications:</p> <p>ISO G-RAS4.E states that “the RAS should only monitor overloading facilities no more than 1 substation beyond the first point of interconnection,” yet it is unclear if this references any overloaded facility or all relevant overloaded facilities. It is also not clear what point of interconnection is intended.</p> <p>ISO G-RAS6 states that “these amounts should be based on the maximum capability of the generating facilities,” but the term maximum capability could mean multiple things. This could be the contractual POI limit in the generator interconnection agreement, the actual capability at the generator terminals at a given temperature, or even the sum of all possible generation in the example of co-located storage and solar PV projects.</p>	<p>For a RAS that trips generation, the point of interconnection for that generation is what is intended.</p> <p>The interconnection service capacity of the generation is what is intended.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		The ISO G-RAS7 guideline provides some temporary flexibility when bridging for system reinforcements, but references “RAS requirements” in general. It is not clear if this is meant to cover both the guidelines and standards, or only one of these categories.	All of the guidelines and standards are what is intended.

5. Do the proposed guideline and standard updates help in simplifying RAS design and implementation?			
No	Submitting Organization	Comment Submitted	CAISO Response
5a	California Wind Energy Association	Please refer to comments in No. 3. CalWEA recommends that a more complicated RAS design be allowed as long as the RAS is fully automatic and completely mitigates the reliability concerns.	The comment has been noted.
5b	Pacific Gas & Electric	PG&E has no comments at this time.	
5c	Rev Renewables	REV has no comment at this time.	
5d	San Diego Gas & Electric	SDG&E believes if items in our response to question 3 are resolved, then the standards and guidelines updates will help simplify RAS design and implementation. (See comments above)	The comment has been noted.
5e	Southern California Edison	Given that the most stringent requirements around simplification are guidelines, it is not clear that the updates will significantly reduce RAS complexity. Historically, SCE has designed many complex RAS and CRAS to accommodate additional generation and reduce curtailment. This RAS initiative documents that this level of RAS complexity causes challenges with the ISO market, but it neither clarifies how the new generation could be accommodated in the absence of complex RAS, nor does it make the simplification criteria enforceable. As such, the new RAS guideline and standard update is not substantially different than the past criteria in the goal of keeping RAS simple and manageable.	<p>The CAISO will work with the PTOs to ensure that we enforce the guidelines either through generation interconnection process or annual transmission planning process.</p> <p>See response to 3a.</p> <p>The new RAS guidelines are more specific than simply a “goal of keeping RAS simple and manageable”.</p>



6. Do the proposed guideline and standard updates help address your concerns in implementing new RAS to connect new resources and/or to maintain transmission reliability? If not, what are the suggested enhancements?

No	Submitting Organization	Comment Submitted	CAISO Response
6a	California Wind Energy Association	Please refer to comments in No. 3.	Please refer to response to 3a
6b	Pacific Gas & Electric	PG&E has no comments at this time.	
6c	Rev Renewables	REV has no comment at this time.	
6d	San Diego Gas & Electric	SDG&E believes if items in our response to question 3 are resolved, then the standards and guidelines updates will help address concerns in implementing new RAS. (See comments above)	The comment has been noted
6e	Southern California Edison	<p>SCE appreciates the efforts that CAISO has put into understanding the impact of RAS on the market model and incorporating stakeholder feedback into the proposed guidelines and standards, but is concerned that much of the content will not be implemented due to the likely cost of physical upgrades or economic impact of congestion management. As such, SCE suggests that some guidelines, such as the simplifications needed for RAS to be compatible with the CAISO market and the 1150/1400 MW tripping limitations, be instead implemented as standards. Guidelines, and deviations from such, alone may not be sufficient evidence justifying the need for a project.</p> <p>The updated RAS guidelines and standards should also indicate how they would be applied across existing RAS and RAS proposed for modification through existing reliability and/or generation interconnection studies in addition to new RAS.</p>	<p>See response to 3d.</p> <p>See response to 3a.</p>



8. Do you have any further suggestions to the proposed guideline and standard updates?

No	Submitting Organization	Comment Submitted	CAISO Response
7a	California Wind Energy Association	Please refer to comments in No. 3.	
7b	Pacific Gas & Electric	PG&E has no comments at this time.	
7c	Rev Renewables	REV has no comment at this time.	
7d	San Diego Gas & Electric	None	
7e	Southern California Edison	SCE has no further suggestions.	

9. Provide any additional comments on the Planning Standards - Remedial Action Scheme Guidelines Update straw proposal and September 26, 2022 stakeholder call discussion:

No	Submitting Organization	Comment Submitted	CAISO Response
8a	California Wind Energy Association	Please refer to comments in No. 3.	
8b	Pacific Gas & Electric	PG&E has no comments at this time.	
8c	Rev Renewables	REV has no comment at this time.	
8d	San Diego Gas & Electric	SDG&E reiterates and refers to our previous comments and proposals that have not been captured so far. SDG&E is open to a call to discuss these if necessary.	Please see CAISO responses to those previous comments
8e	Southern California Edison	SCE has no further suggestions.	