

The ISO received comments on the topics discussed at the July 22, 2022 stakeholder call from the following:

- a. Bay Area Municipal Transmission group (BAMx)
- b. EDF-R
- c. Middle River Power, LLC
- d. Pacific Gas & Electric
- e. Rev Renewables
- f. San Diego Gas & Electric
- g. 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 RAS Guidelines Update initiative revised issue paper:**

No	Submitting Organization	Comment Submitted	CAISO Response
1a	Bay Area Municipal Transmission group (BAMx)	<p>The Bay Area Municipal Transmission group (BAMx) appreciates the opportunity to comment on the California Independent System Operator's (CAISO) Remedial Action Scheme Guidelines Update (RAS Update). The comments below address the CAISO Revised Issue Paper (CAISO Issue Paper) dated July 15, 2022, and discussed during the July 22, 2022 stakeholder meeting.</p> <p>BAMx continues to see and appreciate CAISO's desire to work with Stakeholders to enhance the CAISO planning standards and guidelines. We look forward to working with the CAISO on this collaborative process.</p>	The comment is noted.
1b	EDF-R	<p>EDF-R appreciates that CAISO has re-opened this initiative. EDF-R is concerned with the proliferation of RASs on the CAISO system, both to date and planned, and appreciates CAISO's update on the Generator Contingency and RAS Modeling (GCARM) initiative. EDF-R encourages CAISO to consider limiting the use of RAS in the future, in favor of transmission to enable more interconnection to the transmission system, but cautions that it is inappropriate for future interconnection clusters to bear the cost of major upgrades historically forgone as a result of CAISO's planning guidelines and RAS oversubscription. Such costs are more appropriately borne by the TPP.</p>	The comment is noted.
1c	Middle River Power, LLC	<p>MRP raises four overarching and concerning issues. First, the CAISO notes, on page 4, that the purpose of this initiative is to allow the CAISO and market participants to "...exam[in]e what the practical implications are of certain logical challenges in market solution through the use of [Generator Contingency and Remedial Action Scheme] GCARM either necessitating continuing to rely on existing measures or limiting the use of RAS for certain applications altogether within the established market structure and economic clearing rules."</p> <p>The CAISO developed GCARM in an initiative that began in 2016 and was completed and approved by the CAISO Board of Governors in 2017. In the Revised Issue Paper, however,</p>	The comment is noted.

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		<p>CAISO also notes, on page 4 that "...[i]n implementing GCARM, however, it became apparent that the level of logic complexity through combining multiple features that were acceptable individually could compound to a level that cannot be integrated into market operation while still adhering to the established market clearing rules. Thus, there are limits to the extent GCARM can be relied upon and limits to its ability to replace the use of nomograms."</p> <p>It seems clear that, during the previous stakeholder initiative on this topic the CAISO did not fully understand the challenges and market optimization implications associated with GCARM implementation. MRP respectfully urges the CAISO to avoid a similar outcome with this initiative. As this initiative proceeds, it is imperative that the CAISO identify and disclose the impacts of initiative choices on the CAISO's market optimization, especially on price formation. It is critical for this information to be vetted in this initiative to understand the implications of policy choices before those policy choices are set in stone. The CAISO and market participants should not spend time vetting solutions that work in theory but cannot be implemented due to market optimization limitations.</p> <p>Second, the CAISO should hold within this initiative a fulsome conversation about the myriad tradeoffs associated with RAS proliferation. As the CAISO notes on page 7 of the Revised Issue Paper, while RAS allow for increased transmission utilization at reduced cost (by tripping generation or taking other actions to maintain acceptable reliability performance), with that RAS-enabled increased utilization comes the potential for increased exposure to RAS failure and the yet unresolved challenges associated with integrating the RAS into the market optimization that apparently lie at the market policy heart of this initiative. MRP hopes this fulsome conversation also will help inform the importance of this initiative relative to all the other initiatives currently underway at the CAISO to help the CAISO and market participants prioritize their limited resources.</p> <p>Third, given these difficult and complex issues, the CAISO's draft schedule seems overly aggressive and optimistic. MRP respectfully urges the CAISO to reconsider that schedule in the</p>	

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		<p>August 31, 2022 Straw Proposal to allow time to fully understand the market optimization impacts of various initiative options, and to have the “big picture” conversation about RAS tradeoffs.</p> <p>Finally, the Revised Issue Paper, on page 6, lists five things the CAISO will need to consider on a “case by case basis”:</p> <ul style="list-style-type: none"> <li>• Whether RAS needs to be modeled in the market at all if it addresses the need without further market coordination being required;</li> <li>• Whether RAS would better be modeled through the use of nomograms;</li> <li>• Whether RAS would best be modeled with GCARM capabilities;</li> <li>• If other market constraints could be applied to market operation to achieve GCARM benefits on a more limited and focused basis; and</li> <li>• What gaps can be tolerated between RAS operation in real time and modeling relied on in market operation.</li> </ul> <p>MRP offers that considering situations on a “case by case” basis cannot lead to consistent and optimal outcomes unless the CAISO and market participants first develop a list of principles that govern the application of RAS and its integration into the market optimization.</p>	
1d	Pacific Gas & Electric	<p>In general, PG&amp;E supports the CAISO’s initiative to update the Remedial Action Scheme (RAS) guidelines. The comments are in addition to the 2021 comments provided by PG&amp;E.</p>	The comment is noted.
1e	Rev Renewables	<p>REV Renewables (REV) commends CAISO on relaunching this initiative. We support CAISO’s proposal to relook at the 1150/1400 MW due to anticipated retirement of Diablo and potential impacts to the spinning reserve requirement in light of evolving generation mix in CAISO’s system, as explained in our comments for item #5. We further request CAISO to provide more implementation level details around ISO’s suggestions to prioritize hybrid/co-located resources and energy storage, to dynamically adding or removing gens based on the output. It will be extremely helpful to have the impacts of these suggestions clearly laid out in terms of potential impacts to both the existing and future generation projects. Lastly, we propose</p>	The comment is noted.

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		that any solutions CAISO develops as part of this initiative should be technology neutral and not specifically target certain resource types.	
1f	San Diego Gas & Electric	<p>SDG&amp;E commends the CAISO for initiating this transparent stakeholder process which is needed to improve the planning and implementation of RAS in the CAISO system.</p> <p>This is an important issue as SDG&amp;E firmly believes that RAS have been overused to mitigate transmission issues in lieu of system upgrades. RAS should be considered a temporary measure to allow for more resources in the near-term with a limit to the lifetime before a system upgrade is approved as a permanent solution.</p> <p>Further, SDG&amp;E recommends that CAISO incorporate a plan to review existing RAS in the system, that are either incompatible with GCARM or exceed the planning standards, as part of this initiative.</p> <p>SDG&amp;E offers the following comments and recommendations on the Revised Issue Paper.</p>	The comment is noted.
1g	Southern California Edison	SCE appreciates the opportunity to provide comments on the Planning Standards RAS Guidelines CAISO stakeholder initiative. In collaboration with the CAISO, SCE has been implementing remedial action schemes (RAS) or centralized remedial action schemes (CRAS) to accommodate new generation in lieu of transmission upgrades.	The comment is noted.

**2. Provide comments on the potential issues with removal of some of the guidelines:**

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2a	Bay Area Municipal Transmission group (BAMx)	<p>BAMx appreciates the complexity of RASs and their implementation in the CAISO controlled grid. Some of the RAS have very intricate algorithms and arrangements. Some RASs were established prior to the formation of the CAISO.</p> <p>As the CAISO pointed out, the implementation of the Generator Contingency and RAS Modeling (GCARM) in 2019 addressed some but not all of the market operational issues. It appears GCARM may have created certain unintended consequences that need further assessment or mitigations.</p> <p>BAMx supports the CAISO's effort and stakeholder engagement in reviewing the existing CAISO RAS Guidelines (Guidelines) and proposing solutions to address the identified issues. Due to the complexity of RAS and market operations, BAMx supports the CAISO's cautious approach in considering the removal or modification to some of the Guidelines, particularly the consideration of unintended consequences. For more pragmatic matters, it seems logical to update the Guidelines to remove redundant requirements with PRC-012-2 and to align with NERC terms such as single and double contingency.</p> <p>BAMx looks forward to reviewing and commenting on the CAISO's Straw Proposal scheduled to be posted on August 31, 2022.</p>	The comment is noted.
2b	EDF-R	EDF-R supports removing linguistic confusion from the planning standards and changing all references of SPS to RAS. EDF-R requests that with the next paper CAISO provide a proposed redline of the CAISO planning standards to better illustrate what substantive changes are being proposed.	The comment is noted.
2c	Middle River Power, LLC	MRP supports the CAISO modifying, enhancing or removing RAS guidelines to ensure consistency with NERC Reliability Standards and, MRP hopes, consistency with the principles MRP urges the CAISO to consider and develop in the answer immediately above.	The comment is noted.

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2d	Pacific Gas & Electric	PG&E has no further issues with the removal of the guidelines as these are being addressed under the PRC-012-02 and the NERC TPL-001-05 standards.	The comment is noted.
2e	Rev Renewables	REV has no comments.	
2f	San Diego Gas & Electric	<p>SDG&amp;E supports the removal of SPS guideline #1,2,5,11,13, and 15 since they are already covered in PRC-012-2. SDG&amp;E also supports the update of SPS4 with PRC-012-2. The purpose of PRC-012-2 is to ensure that Remedial Action Schemes (RAS) do not introduce unintentional or unacceptable reliability risks to the Bulk Electric System (BES). Therefore, these SPS guidelines are not intended to duplicate the PRC-012-2 NERC reliability standard, but to complement it where it is in the best interests of the security and reliability of the non-Bulk Electric System facilities under ISO operational control. SDG&amp;E suggests capturing the following clarifications in the straw proposal:</p> <ul style="list-style-type: none"> <li>• Whether the PRC-012-2 standard will also be applied to non-BES schemes. This is an important clarification. Although SDG&amp;E believes that the design of BES and non-BES schemes should follow the same principles, SDG&amp;E does not support applying PRC-012-2 compliance requirements to non-BES schemes.</li> <li>• Will PRC-012-2's definition of limited impact RAS be included in the Planning standard and processes?</li> <li>• Will the WECC RAS Design Guide no longer apply with the removal of ISO SPS2?</li> <li>• Finally, it would be helpful if a table is added in the straw proposal that maps the removed guidelines to the specific PRC requirements. This will ensure that nothing is missed.</li> </ul>	<p>The comment is noted.</p> <p>The ISO does not apply PRC-012 to non-BES RAS. However, the ISO RAS guidelines are expected to continue to be applied to non-BES RAS.</p> <p>Yes, PRC-012-2's definition of limited impact RAS will be included in the updated ISO Planning standards.</p> <p>The RAS Design Guide will be replaced with the requirements in the PRC-012-2 for the Reliability Coordinator's approval.</p>
2g	Southern California Edison	The tripping thresholds of 1150 MW and 1400 MW go beyond programmed limits and, in some cases, inform the design of substations and associated generation tie-line capacity. While SCE has not studied this issue to be able to opine on the overall reliability impact of changing these limits, it is important to note that lowering them would result in long-term curtailment of some generating facilities. Additionally, 1150 MW is in the range of capacity that could be lost due to the failure of a single piece of substation electrical equipment.	The comment is noted.

**3. Provide comment on any other RAS guideline issues that have not been captured in the current guidelines:**

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3a	Bay Area Municipal Transmission group (BAMx)	BAMx appreciates the CAISO's completeness and thoughtfulness in assessing issues with the current Guidelines. At this time, BAMx is unaware of other issues and looks forward to reviewing and commenting on the CAISO's Straw Proposal scheduled to be posted on August 31, 2022.	The comment is noted.
3b	EDF-R	In answers to question 4 EDF-R suggests that CAISO planning guidelines should more clearly illustrate when an SPS meets the threshold for subjective terms such as "complex" and "unmanageable" and that CAISO planning standards and TPP Plans should publish an annual assessment of the performance sufficiency of each existing and planned SPS for the TPP study year.	The comment is noted.  Compliance with PRC-012 requires periodic evaluations of RAS performance.
3c	Middle River Power, LLC	MRP has no comment on this topic.	
3d	Pacific Gas & Electric	N/A	
3e	Rev Renewables	REV has no comments.	
3f	San Diego Gas & Electric	SDG&E recommends that SPS16 should be updated to reflect an effectiveness factor and/or flow impact factor. Using low effectiveness and flow impact factors should be avoided as they provide little benefit to the reliability of the system. Furthermore, CAISO should also address how distribution-connected resources should be treated with respect to RAS and non-BES schemes.  SPS3 specifies the maximum net amount of generation tripped for single and double contingencies, however it does not specifically address the maximum amount of total generation capacity which could possibly be tripped by a RAS. SDG&E finds this issue to be of particular importance and supports revising the existing limitations in the Planning Standards to include the maximum net amount of generation capacity for RAS planning purposes. SDG&E is concerned with complex schemes engaged in dynamic arming/disarming of units, which contradicts the philosophy of designing schemes that are simple and manageable.	Distribution factors as well as the overall all flow impact of large generating facilities on lower voltage facilities in parallel with the high voltage system should be reviewed to ensure the RAS is effective.  This topic was discussed in the Revised Issue Paper.
3g	Southern California Edison	SCE supports consideration of how generating facilities with BESS participate in a RAS/CRAS, through either modification	



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		<p>SCE has concerns about the substantial complexity that is created when a RAS/CRAS requires monitoring or tripping across different PTOs. SCE has determined that the operational complexity is too great when an SCE RAS/CRAS must monitor contingencies beyond a line/transformer bank that terminates at an SCE-operated facility (i.e. up to one bus away when status is monitored on both ends). As a result of this concern SCE, in consultation with the CAISO, has modified proposed RASs to exclude monitoring of contingencies located outside of the SCE service territory. Once such example is the Ivanpah Area RAS in which proposed contingencies to be monitored in addition to generation were subsequently removed. Such concerns and practices should be documented in any upcoming revision.</p>	



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		<p>2. An assessment of how well the SPS manages the planning year's scenarios (for example: very well, sufficient, poorly)</p> <p>3. If managing outages in the area are becoming "unmanageable"</p> <p>4. What the alternative transmission solution would be, including the timeline to construct</p> <p>Publishing this data on the existing and planned RAS will provide an efficient look ahead (and look back) on RAS sufficiency. When RAS are poorly managing scenarios, CAISO the planning area narrative should include justification for the RAS remains in place, or a suggestion for reconfiguration or new transmission.</p>	<p>The comment is noted.</p>
4c	Middle River Power, LLC	<p>The current Special Protection Scheme ("SPS") guidelines, which are included in the CAISO's Planning Standards, provide general guidance that focuses exclusively on reliability. MRP can envision that an outcome of this initiative could be the development of additional SPS guidelines that address the integration of those SPS into the CAISO's market optimization. The Revised Issue Paper does not provide enough information for MRP to offer a meaningful opinion as to whether some or all the SPS guidelines should be converted to mandatory reliability standards.</p>	<p>The comment is noted.</p>
4d	Pacific Gas & Electric	<p>Current RAS guidelines don't provide enough information regarding the design of the new RAS. A lot of the terms are loosely defined in SPS 6. For example, "local contingencies" in SPS6(A), "System elements or variables", "unnecessary actions" and "materially increase" in SPS6(B), and location of monitored facilities in SPS6(C). These terms should be clearly defined to avoid confusion. Furthermore, "exceptions" in SPS6(B) can increase complexity in designing the RAS and should be re-evaluated.</p> <p>When proposing a new RAS among different alternatives, even though it meets the RAS technical design criteria and may seem to be cost efficient initially, consideration should be given based on potential RAS interaction, complexity of design, implementation and operation, long term operation and</p>	<p>The comment is noted.</p>



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		<p>controller station should be considered “remote.” Tripping of such facilities should be avoided beyond the limits specified herein. Therefore, SDG&amp;E proposes deletion of local in SPS6 part (A)</p> <p>A) There should be no more than 4 6 local contingencies (P1 single or credible doubleP7 contingencies) that would trigger the operation of a SPS RAS or non-BES RAS.</p> <p>Edits to SPS7 guidelines:</p> <p>SDG&amp;E suggests that SPS7 be updated to specifically address RAS or non-BES RAS which are used to mitigate BESS charging issues. The high penetration and interconnection requests of storage projects, combined with the high selection of storage resources as part of the CPUC IRP and CEC SB 100 portfolios, are increasing charging challenges. SDG&amp;E had to design a complex scheme recently to address reliability issues that required monitoring flow directions and multiple contingencies. We now have instances where a RAS will be used to simultaneously mitigate reliability issues due to volatile power injections and withdrawals for storage projects which may participate in the ancillary service market.</p> <p>C. In order to promote greater adherence to the guidelines, SDG&amp;E supports making them mandatory standards with regional differences where the IOUs can’t reach a consensus. This would be similar to the voltage criteria currently listed in the CAISO planning standard. In particular, it is extremely important to make the ISO SPS6 guideline mandatory. The goal of making RAS/SPS “simple and manageable” is paramount to decreasing unforeseen circumstances and ensuring system reliability.</p>	<p>The comment is noted</p> <p>Given the framework of a common high voltage transmission access charge across the ISO, inequities could be introduced by a “regional differences” approach to the guidelines.</p> <p>The comment is noted.</p>
4g	Southern California Edison	SPS 6 provides guidance to keep a RAS simple, but does not provide guidance on how to proceed when an existing RAS becomes incrementally more complex, which often occurs due to factors such as new generation projects or new loop-in	The comment is noted.

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		<p>substations. This has led to some initially simple RAS growing far above the recommended six contingency monitoring. Also, the guidance that a RAS can become larger to avoid creation of an overlapping new RAS has created some extremely complex RAS that mitigate system congestion points with a wide area contributing to the limitation.</p> <p>With conversion to a centralized remedial action scheme (CRAS), a RAS is no longer hardware limited to a set number of monitoring contingencies or tripping points. However, this can still cascade to create considerable planning/design complexities, operating complexities, and market complexities. It may instead be helpful to measure complexity in terms of the broad considerations impacting the RAS/CRAS, such as the following:</p> <ul style="list-style-type: none"> <li>• the impact remote facilities and loop flows can have on the RAS/CRAS,</li> <li>• the extent to which outage N-1 conditions create special operating procedures or drive RAS/CRAS scope,</li> <li>• the number of PTOs involved to plan, design, test, operate, and maintain a RAS/CRAS, or</li> <li>• amount of generation included on a RAS</li> </ul> <p>In other words, the types of contingencies may be more important than the number of contingencies.</p> <p>Also, the existing criteria do not provide direction for projects seeking interconnection behind a constraint with a RAS/CRAS that has grown too complex. These projects could be either more or less effective at addressing the constraint than earlier-queued projects. In some cases there is a clear reliability issue, such as stability, in the absence of RAS/CRAS participation. At other times curtailment may be viable, though it is unclear if it is desirable, or would be addressed concurrently with previously queued projects or in a separate participation category.</p>	

**5. Are there any other RAS-related issues that need to be captured in the Issue Paper?**

No	Submitting Organization	Comment Submitted	CAISO Response
5a	Bay Area Municipal Transmission group (BAMx)	BAMx appreciates the completeness and thoughtfulness of the CAISO Issue Paper. At this time, BAMx has no other specific comments on the Issue Paper. BAMx looks forward to reviewing and commenting on the CAISO's Straw Proposal scheduled to be posted on August 31, 2022.	
5b	EDF-R	<p>Protection from Risk for Existing and In-Flight Generation</p> <p>In the policy paper CAISO states that “As a result, the amount of generation that was connected and available to be armed to these RAS exceeds the planning guidelines” and on the stakeholder call CAISO described that some RAS are oversubscribed by as much as 1000 MW and that some RAS are nested within other RAS. Existing generation and in-flight development are dependent on existing and planned RAS. Disruption of these RAS is quite likely to create subsequent disruptions in facility operations and RA contracting. EDF-R requests that CAISO does not modify or further restrict the use of RAS until comparable or better solutions are in place, and that any changes to existing or in-flight RAS are widely socialized with affected generators.</p> <p>At a minimum “in-flight generation” should be defined as generation with an executed Generator Interconnection Agreement. At that stage in development interconnection customers have a reasonable expectation that project interconnection plans are basically firm and established.</p> <p>Furthermore, EDF-R requests CAISO provide empirical data and examples of how any change proposed by CAISO would impact curtailment across generators participating or not into a RAS, and LMP signals. In particular, for oversubscribed RAS, how would modifying existing RAS to a fixed set of generators affect curtailment of generators in the RAS and market signals, and how the oversubscription being accounted for in operations, transmission and interconnection processes and studies?</p> <p>Considerations for the TPP</p> <p>Consistent with other comments in this document and elsewhere, EDF-R encourages CAISO to consider limiting the use of RAS in the future. EDF-R believes that it is clear that</p>	The comment is noted.

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		<p>California is in need of more transmission to enable interconnection to the transmission system and based on operations observations and RAS planning standards in other ISOs that RAS has the effect of masking transmission needs. EDF-R cautions that it is inappropriate that future interconnection projects could bear the cost of major upgrades historically forgone due to CAISO's planning guidelines and RAS oversubscription. Such costs are more appropriately borne by the TPP.</p> <p>With respect to specific projects and RAS, EDF-R encourages CAISO to look at what is needed to resolve 500kv Devers-Colorado Rivers congestion and RAS in this year's TPP. RAS use in this area is widespread, already limiting generation, and immediate review is sensible.</p> <p><b>Fictitious Bus Solution</b></p> <p>Before providing an opinion on CAISO's suggestion to create separate fictitious buses so that generation on RAS is not on the same bus as generation that is not on RAS EDF-R would like to better understand potential impacts of this. Once online all generation should be treated equitably by the market model transmission system. Is it just and reasonable for generators that are otherwise similarly situated to be subject to different treatment because of the RAS? Similarly, EDF-R is reluctant to endorse any fuel-type based treatment to identify which generators would be subscribed to the RAS, such a policy appears to be discriminatory. If CAISO decides to include this as a possible solution in the straw proposal, EDF-R requests CAISO provide empirical data and model how the fictitious bus solution would affect curtailment and LMP signals.</p> <p><b>Changes to single and double contingency limits</b></p> <p>EDF-R requests more detail on the possibility of CAISO changing the single contingency (1100 MW0 and double contingency (1400) amounts. For most items in the paper CAISO presented possible solution sets for stakeholder consideration, but not for the contingency item. EDF-R would like to better understand the potential benefits or concerns with raising or lowering the contingency limits, and if any other</p>	

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		<p>guidelines or planning standards (NERC, WECC, etc) besides inform the limits.            Implementation of new standards            EDF-R requests CAISO provide with its next paper a table illustrating when and where new RAS standards will be implemented:</p> <ul style="list-style-type: none"> <li>• Which TPP planning cycle will first use the new standards? 2022-2023? Or 2023-2024?</li> <li>• Will the new RAS standards apply to Cluster 14 studies? Or start with cluster 15?</li> <li>• What of CAISO's recently published 20-year plan?</li> </ul> <p>How would new SPS guidelines shift those results, particularly in the scenario where tripping limits are reduced with the retirement of Diablo Canyon.</p>	
5c	Middle River Power, LLC	None other than those MRP has mentioned above	
5d	Pacific Gas & Electric	<p>1) When comparing RAS with other alternatives, long-term operation and maintenance costs should be included. Considering the full life cycle of a RAS, the cost benefits of RAS need to be significant. It would be better if cost benefits are defined. For example, a cost limit may be established for RAS, or a RAS is allowed if its cost is under a certain percentage of the system upgrade alternative.</p> <p>2) In the Issue Paper, CAISO brings up the concerns of the complexity from hybrid resources. In the design of a RAS, PG&amp;E would like to add that RAS with bi-direction flow is not recommended. Recommendation is to use RAS for single direction flow. RAS logic may need to specify which technology to trip for hybrid resources.</p> <p>3) At present, trying to mimic what Market does with planning study simulations is challenging because of the inadequacy of tools and it can also require more human interactions.</p>	The comment is noted.
5e	Rev Renewables	<p>REV will like CAISO to provide more details on the following CAISO suggested items:</p> <ul style="list-style-type: none"> <li>• Why does selecting hybrid/collocated and energy storage projects before stand-alone solar and wind resources as part of 1150/1400 MW RAS limit, not degrade Resource Adequacy (RA) Deliverability? Is this tied to these resources having better availability (as compared to standalone PV/Wind)</li> </ul>	Yes, it is tied to hybrid resources have better availability. Hybrid resources are typically studied at their maximum Interconnection Service Capacity (ISC) value in the on-peak deliverability studies. Standalone PV and wind are studied a fraction of their maximum ISC

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		<p>during anticipated CAISO peak? We also request that CAISO clarify whether these kinds of RAS will be out of CAISO markets (Nomograms) so that the risk of over curtailment is reduced for these hybrid/co-located/standalone storage projects.</p> <ul style="list-style-type: none"> <li>• Please explain ISO's thinking on the implementation process to add the most effective generation and whether this will be utilized for future RAS only? It will be also helpful to understand how this concerns generators with less effectiveness who also paid for the upgrades. The addition of most effective generation should help reduce the overall curtailment, which in turn benefits low effective gens with a higher/ longer duration dispatch.</li> </ul> <p>REV agrees with ISO's thinking on the impact on 1150/1400 MW due to potential retirement of Diablo. As these numbers are based on minimum amount of spinning reserves that ISO has historically carried, it will be helpful to assess the needs based on today's system needs. With the changing ISO generation fleet, this number should be assessed regularly based on ISO's reliability needs.</p>	<p>in the on-peak deliverability studies. However, the ISC capacity value of either would fully count towards the 1150/1400 MW RAS limit.</p> <p>The comment is noted.</p> <p>The comment is noted.</p>
5f	San Diego Gas & Electric	<p>SDG&amp;E recommends that the following key items also be addressed as part of this initiative:</p> <ul style="list-style-type: none"> <li>• RAS should only be used as a temporary mitigation to provide Resource Adequacy (RA) deliverability, in lieu of Delivery Network Upgrades (DNUs): It is SDG&amp;E's understanding that the CAISO wants to encourage the interconnection of RA resources at locations that have fewer system constraints and reduced need for curtailments (meaning locations that have appropriate transmission capacity). Using RAS instead of a DNU not only defeats this goal but can potentially distort the IRP portfolio designs by allocating resources to locations where transmission capacity would be constrained absent a RAS. The current IRP process does not take into account that some of the RA resources are located in areas that have RASs. In addition, reliability of the IRP portfolio could be degraded as it does not consider the probability of significant curtailments due to RAS.</li> </ul>	<p>The comment is noted.</p>

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		<ul style="list-style-type: none"> <li data-bbox="520 269 1207 431">• Special Protection System was retired from the NERC Glossary of Terms Used in NERC Reliability Standards effective 4/1/2017. The use of Remedial Action Scheme to replace Special Protection System throughout the ISO Planning Guidelines is recommended.</li>   <li data-bbox="520 472 1207 667">• N-0 RAS must be avoided: SDG&amp;E proposes to eliminate any RAS proposed to mitigate a P0 overload in areas where we have capacity constraints with all lines in service. Building new transmission facilities is necessary to maintain the overall reliability of the system. Special consideration should be taken especially in High Fire Threat District (HFTD) areas.</li>   <li data-bbox="520 708 1207 1032">• Simplification of RAS by limiting the number of Nomogram associated with them and/or action taken by the RAS: Complex RAS that requires a nomogram that triggers other RAS or opening a 500kV line, can degrade system reliability hence not meeting system performance criteria if the RAS fails or inadvertently operates. Furthermore, SDG&amp;E recommends avoiding the removal of critical facilities (e.g., 500 kV lines) during a RAS operation. Removal of critical facilities by a RAS, during PSPS events which also coincide with peak loads, can lead to greater reliability issues.</li>   <li data-bbox="520 1073 1207 1300">• <ul style="list-style-type: none"> <li data-bbox="520 1105 1207 1300">o It is important to model/account for all operational procedures, nomograms in the planning cases in order to ensure the best continuity between planning and operations. This will limit instances where an unrealistic RAS might be implemented, which would present a reliability risk to the system.</li> <li data-bbox="520 1308 1207 1500">o The inverse is also true where every effort should be made to model RAS and other operational procedures in the market, as any omissions may lead to an unreliable generation dispatch. As such, SDG&amp;E encourages that all future RAS at a minimum fit within the capabilities/framework of GCARM, with a longer-term goal of more consideration of all operational</li> </ul> </li> </ul>	

No	Submitting Organization	Comment Submitted	CAISO Response
		<p>phenomena in GCARM (and from GCARM into the transmission planning cases).</p> <ul style="list-style-type: none"> <li>SDG&amp;E recommends development of prioritization guidelines that would dictate the planned generation to be tripped and/or sequence of any RAS action. Such guidelines might include consideration of resource type, order of interconnection, or other criteria that can be developed and implemented in a non-discriminatory manner.</li> </ul>	
5g	Southern California Edison	<p>One issue that the CAISO discusses is whether a RAS should be modified to trip the most effective generation to improve the overall reliability and security of the system and improve efficacy since doing so could raise concerns with generators perceiving different treatment. As a departure from how legacy RASs are designed and operate, the SCE CRAS is designed so that participating generation facilities with the greatest effective shift factor are selected first for tripping. This will result in certain generators always being tripped while others will or may have a significantly less probability of getting tripping. And as the amount of participating generation continues to increase, generation with poor shift factors that pay for upgrades to be included on the CRAS will have an even smaller likelihood of being tripped if at all. While this operation is meant to reduce curtailment either pre or post outage by tripping the most effective generation, it does also result in the concern that the CAISO highlights, namely that certain generators will be perceived as different.</p> <p>This issue supports the earlier SCE comment that only highly effective generating facilities should participate in a RAS. When there is ample generation, those with more effective shift factors will always be selected first.</p>	The comment is noted.