



ISO Planning Standards Remedial Action Scheme Guidelines Update

Issue Paper

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ISO Planning Standards: Remedial Action Scheme Guidelines Update

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1. Introduction

The ISO Remedial Action Scheme (RAS) guidelines are part of the California ISO Planning Standards (ISO Standards).¹ The RAS guidelines, along with the other requirements in the Planning Standards, complement the existing NERC/WECC Reliability Standards and ensure a secure and reliable ISO infrastructure development. The current RAS guidelines section has 17 guidelines. Each of these guidelines provide a good engineering practice-based framework from the inception to the ultimate design and operation of the RAS originated from various Planning processes.

Although these guidelines have helped the ISO extensively in designing multiple RAS, there is a need to update these guidelines considering several new drivers such as new updated reliability standards (TPL-001-5 and PRC-012-2), various ISO initiatives (Generator Contingency & RAS Modeling initiative), a significant expected increase in the number of RAS proposed through planning processes and planned retirement of Diablo Canyon nuclear generating units. Some of the guidelines that were originally utilized to address the impacts of some of these drivers are now redundant and need to be updated.

This initiative will review the existing ISO RAS guidelines and any references to the RAS guidelines as captured in Section III and any other section of the ISO Standards. The initiative will remove any redundant guidelines that are already covered under mandatory NERC PRC-012-2 Standard, and update other guidelines as needed based on the recent changes. While most of the guidelines provide a good utility practice framework, the ISO will also explore opportunities to replace some of these with mandatory standards based on the latest reliability needs.

The ISO has developed this issue paper to provide stakeholders with the required background, the need to update and the potential impacts based on the proposed modifications. This paper and the subsequent stakeholder engagement sessions will be utilized to review and refine some of the proposed modifications as well as to seek feedback on other potential changes from the stakeholders.

2. Background and Issues

The ISO RAS guidelines were intended to encourage and allow the use of RAS to maximize the use of existing transmission facilities while maintaining system reliability and operability of the ISO controlled grid. Over the years, utilizing the guideline, the ISO has selected RAS over new transmission facility primarily due to faster implementation timeline, lower costs, increased utilization of existing facilities and a more efficient use of scarce transmission resources associated with the RAS. The guideline and its utilization have helped keep costs down for integrating new generation into the grid and/or addressing reliability concerns under various studied system conditions. However, the increased transmission system utilization that is partly made possible with implementation of the RAS also potentially results in increased exposure of not meeting system performance criteria if the RAS fails or inadvertently operates. Transmission

¹ <http://www.caiso.com/Documents/ISOPlanningStandards-September62018.pdf>

outages can become more difficult to schedule due to increased flows across a larger portion of the year; and during a planned or forced outage of nearby facilities that affect the distribution of flows on the system. Additionally, the change in the effectiveness of the RAS during outages also adds to the operational complexity. The system can become more difficult to operate due to proliferation of the RAS that may cause coordination concern among the RAS in close proximity with other RAS in the vicinity area. These challenges have become more pronounced considering the 18,000 MW of new generation that has already been interconnected over the past 10 years, and an additional 27,000 MW of generation that will potentially interconnect in the next 10 years. There are currently 69 NERC-related RAS on the BES system with 23 of those RAS being added in the last 10 years. Without updates to the existing RAS guidelines, it is expected that over the next ten years an excessive amount of RAS will be added to the system. A review of the use of RAS in other ISO/RTOs in the country indicated that the California ISO relies far more on the use of RAS in lieu of transmission upgrades than the rest of the industry.

Besides the potential concerns with the numerous existing and proposed RASs, there have been other changes such as major updates to the TPL and PRC standards, various ISO initiatives (Generator Contingency & RAS Modeling initiative)², and planned retirement of Diablo Canyon units. These changes require updating some of the existing guidelines to align with the changes and ensure any future RAS proposed through the process do not adversely impact the reliability of the ISO grid. The following paragraphs will discuss each of the changes and the proposed updates to the ISO guidelines.

There are several terms and multiple guidelines which despite their usefulness over the years have now become redundant with some of the requirements in the mandatory NERC TPL and PRC Standards. For instance, use of terms such as the single, double and credible double contingency in the current guideline does not align with the use of these terms in the NERC TPL Standards and needs to be updated. These terms, when originally used, were consequence oriented. For example, single contingency will align closely with current NERC TPL-001-5 P1 category (Loss of one transmission circuit, transformer etc.). Similarly, the term double contingency, as used in the guideline, will closely align with the current NERC TPL-001-5 category P7 and in some instances credible 500 kV common corridor P6 contingencies. The term double contingency is not used in the latest TPL standards, and therefore needs to be replaced with the appropriate NERC TPL contingency category type. Besides these terms, some of the guidelines originally established to provide a good engineering practice framework to address issues such as failure, redundancy and inadvertent operation of the RAS have also now become redundant with the NERC PRC-012-2 Standard requirements.

In addition to the usage of terms that do not align with the NERC Reliability Standards, there are other terms used in the guideline elsewhere that need to be either defined or removed altogether. For instance, the ISO SPS 6 guideline related to the maximum number of contingencies and maximum number of monitored system variables uses the term 'Local contingencies' that is not

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http://www.caiso.com/informed/Pages/StakeholderProcesses/CompletedClosedStakeholderInitiatives/GeneratorContingency_RemedialActionSchemeModeling.aspx

defined in the existing RAS guideline. The ISO is soliciting feedback on either defining the term or updating the ISO SPS 6-C guideline related to specifying the maximum electrical distance of the monitoring facility to clarify the scope of local contingencies. Additionally, the current RAS guideline such as ISO SPS 6 may not provide adequate information for the design of the new RAS, particularly complicated RAS that includes remote monitoring of line contingencies and limiting elements and curtailing remote generation that may not be adequately effective. Increased complexity in the RAS operation may pose significant challenges in ensuring reliable operation of the RAS and preventing its potential misoperation.

With the increased implementation of battery energy storage system (BESS) in the CAISO-controlled grid, the RAS guideline may need to be updated to reflect increased complexity in implementing RAS to mitigate potential reliability concern due to volatile power injections and withdrawal for BESS, depending on its mode of operation. The RAS may become more complex due to the need to monitor flow directions as well as a larger number of contingencies that may cause reliability concerns.

There have also been other development such as the planned retirement of the Diablo Canyon generating facility. This will directly impact the RAS guideline related to the amount of generation curtailment and maintaining the spinning reserve requirement. The current ISO guideline for the maximum amount of generation that can be curtailed for a single contingency via the use of RAS cannot exceed the maximum capacity of one Diablo Canyon unit at 1150 MW. The guideline for double contingency is 1400 MW and these limits were based on the minimum amount of spinning reserves that ISO has historically been required to carry. Considering the scenario with the planned retirement of Diablo Canyon generating facility, the guideline for the maximum amount of generation curtailment in a RAS needs to be reviewed and updated as necessary.

Lastly, there have been ISO-driven initiatives such as the GCARM initiative that models the RAS in the market model. This has turned out to be more of a challenge than was expected and is considered a work in progress. Currently, the ISO is not expecting this initiative to have any material impacts to the RAS guidelines. However, based on the development of such initiatives, the RAS guideline might need future updates.

3. Next Steps

Due to the issues and challenges outlined above, the ISO is planning to propose changes to the current guidelines in order to provide further clarity for RAS development, and also explore opportunities to potentially limit the use of future RAS in an area that is saturated with existing RAS. This issue paper serves to start the process by identifying some of the key issues. The ISO will seek comments from the stakeholders to identify any current and additional issues as feedback to this issue paper. The ISO will consider potential solutions to address these issues in the first straw proposal.

4. Stakeholder Engagement

The ISO is proposing the following schedule to engage the stakeholders for this initiative.

4.1. Schedule

Table 1 lists the proposed schedule for the review and updates to the current ISO RAS guidelines.

Table 3: Schedule

Item	Date
Post Issue Paper	17-Jun-21
Stakeholder Call	24-Jun-21
Stakeholder Comments Due	9-Jul-21
Post Straw Proposal	9-Aug-21
Stakeholder Meeting	16-Aug-21
Stakeholder Comments Due	30-Aug-21
Post Revised Straw Proposal (tentative)	27-Sep-21
<i>Stakeholder Meeting (tentative)</i>	4-Oct-21
<i>Stakeholder Comments Due (tentative)</i>	18-Oct-21
Post Draft Final Proposal	6-Dec-21
Stakeholder Call	13-Dec-21
Stakeholder Comments Due	27-Dec-21

The ISO proposes to present its proposal to the CAISO Board of Governors in November 2021. The ISO is committed to providing additional opportunities for stakeholder input as required to support the goals of this initiative. Stakeholders can submit written comments through the ISO's [commenting tool](#).

4.2. Next Steps

The ISO will discuss the Issue Paper during the stakeholder call on June 24, 2021. The ISO requests that the stakeholders submit written comments by July 9, 2021.