Stakeholder Comments Template

Subject: Regional Resource Adequacy Initiative

Submitted by	Company	Date Submitted
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This template has been created for submission of stakeholder comments on the Straw Proposal for the Regional Resource Adequacy initiative that was posted on February 23, 2016. Upon completion of this template please submit it to initiativecomments@caiso.com. Submissions are requested by close of business on **March 16, 2016.**

Please provide feedback on the Regional RA Straw Proposal topics:

1. Load Forecasting
   a. *Weather-normalized load forecast: We assume that the hourly load forecast used to assess adequacy is a weather-normalized value. The CAISO should clearly define how it defines weather-normalization to ensure that load forecasts for potential new members (LSEs) outside the current ISO footprint are consistent.*
   b. *Energy Efficiency: We agree that energy efficiency savings should be included in the hourly load forecast. We recommend that these savings also be reported separately along with a description of how they are assessed.*
   c. *Distributed Generation: We agree that the effects of distributed generation (e.g. solar rooftop) be included in the load forecast and we recommend that this behind-the-meter generation also be reported separately.*
   d. *Demand Response: Since demand response refers to actions that can be taken, if necessary, to offset high peak-hour loads, we recommend that it be accounted for on the resources side of the adequacy calculation. However, if DR is included in the loads, we recommend that it also be reported separately.*

2. Maximum Import Capability Methodology
   a. *Using the "maximum amount of simultaneous energy schedules into ISO BAA, at the ISO coincident peak system load hours over the last two years" to assess maximum import capability can arbitrarily limit the availability of imports from the Northwest. We recognize that the MIC is simply an upper*

bound for import <u>transfer capability</u>. We also assume that for the adequacy assessment, an estimate of the <u>availability</u> of NW imports will be made. However, in a situation when the NW has had two very dry years followed by an average or wet year, the MIC (based on the dry years) would arbitrarily limit the available imports from the Northwest.

b. *We recommend that the MIC be calculated based on a longer historical record and on the calculated north-to-south transfer capability instead of the energy schedules.*
c. *We also recommend that availability of imports from the Northwest be based on more robust stochastic assessments instead of deterministic load/resource balance calculations (e.g. as reported in the Bonneville Power Administration's White Book).*

3. Internal RA Transfer Capability Constraints

4. Allocation of RA Requirements to LRAs/LSEs

5. Updating ISO Tariff Language to be More Generic

6. Reliability Assessment
    a. Planning Reserve Margin for Reliability Assessment
        i. *<u>Not all PRMs are Equal</u>: In our work with the IEEE Loss of Load Expectation Best Practices Work Group, we have observed that planning reserve margins across the country vary dramatically depending on what uncertainties they are designed to cover. For example, some LSEs design their PRMs to only cover thermal forced outages and contingency reserves. Some LSEs add a component to cover load uncertainty due to temperature variations and some include a component for transmission. Some LSEs have to account for uncertainties that do not exist in other areas, for example, the NW has to deal with streamflow uncertainty for its hydroelectric system. Thus, defining a single PRM for an ISO footprint that spans many diverse areas could lead to subareas that are over or under protected with respect to adequacy. One way to avoid this problem is to define a probabilistic adequacy metric and threshold for the entire CAISO footprint and then derive local PRMs based on that adequacy standard (see the discussion below on "deterministic vs. probabilistic PRM" for more detail).*
        ii. *<u>Balancing Reserves</u>: Generally, balancing reserves (to compensate for within-hour deviations in load and in variable resource generation) are allocated to specific resources, whose availability is adjusted accordingly. If that is not the case, balancing reserves must be added to the PRM. But that is not recommended because resources providing those reserves have to be specified ahead of time.*
        iii. *<u>Deterministic vs. Probabilistic PRM</u>: Historically, PRMs have been developed via a "building block" approach, that is, each uncertainty*

to be covered is assigned a specified percentage of surplus capacity, with the final PRM being the sum of all the components. For example, a typical PRM of 15 percent might include 6 percent for contingency reserves, 5 percent for forced outages and 4 percent for variation in load due to temperature. However, defining a PRM in this deterministic manner does not present a clear indication of what level of adequacy is being provided. A better approach (but much more complicated) is to use probabilistic methods to define a PRM. For this approach, an LSE must first define a metric to measure adequacy and then set a threshold for that metric. For example, the NW Power and Conservation Council has adopted a 5-percent maximum threshold for the loss of load probability of the NW power supply. In simple terms, this means that if the likelihood of the region experiencing a shortfall in the year being assessed is 5 percent or less, the power supply is deemed to be adequate. The 5 percent standard can be translated into a PRM by constructing a power supply with exactly a 5 percent LOLP and then extracting the resource capacity and dividing it by the weather-normalized peak load. The use of probabilistic methods to define PRMs is becoming more and more common across the country. Any adequacy metric and threshold will work. NERC has developed a pilot program to standardize the metrics used to assess adequacy. Those metrics are loss of load hours and expected unserved energy. However, NERC is not tasked with setting thresholds for those metrics, nor is it anticipated that universal thresholds will be developed anytime soon (if ever). Those threshold must be developed regionally, such as was done by the Council for the Northwest portion of WECC.

iv. *<u>Accommodating Diversity</u>: If a common adequacy standard existed, such as the 5 percent LOLP for the NW, then CAISO subareas could use that standard to define the specific PRM for their own area. It is quite possible then for various subareas to have different PRM values but at the same time they would all be providing exactly the same level of adequacy for their customers. Unfortunately, no common resource adequacy standard exists. Having one overarching PRM for the entire CAISO footprint can lead to overbuilding in areas whose local PRM is smaller than the CAISO PRM. Conversely, a subarea with a local PRM that is greater than the CAISO PRM might lead the CAISO to assume that the subarea is surplus when in fact it is not. Without a predefined probabilistic resource adequacy standard, it is difficult to determine whether all subarea within the CAISO are actually providing the same level of supply adequacy.*

b. Resource Counting Methodologies for Reliability Assessment

i. *<u>Variable Energy Resources</u>: The capacity contribution of variable energy resources (such as wind and solar) must be assessed as a function of the system that they are being added to. Variable resource capacity can be more dependable if sufficient flexibility (i.e. storage) is available to compensate for the variability in its generation. As more*

VERs are added, and as more system flexibility is consumed, the amount of dependable VER capacity decreases. Thus, the only way to properly count the contribution of VERs is to assess their effective load carrying capability (ELCC). Methods to assess ELCC are well documented but, as a practical matter, it may be difficult because detailed simulation models may be required.

ii. *<u>Market Supplies</u>: Some LSEs do not count market supplies when defining their planning reserve margins. In those cases, LSEs choose to only count on contracted or owned resources to provide adequacy. This approach could lead to slightly overbuilt systems depending on the availability of market supplies. For the west coast, due to the diversity of resources and loads, it makes economic sense to count some amount of market supply to provide for an adequate system. However, as with variable energy resources, the amount of market supply to count in defining the PRM has to be dependable. For example, market availability from the Northwest, which has high variability in surplus energy, should likely be limited to an amount based on low runoff volume years.*

iii. *<u>Energy Efficiency and Distributed Generation</u>: We have already commented on how these should be counted.*

iv. *<u>Demand Response</u>: We suggest that demand response resources be included on the resource side of the ledger.*

v. *<u>Balancing Reserves</u>: As mentioned earlier, we suggest that balancing reserves be allocated to specific resources and that the capabilities of those resources be adjusted accordingly.*

c. ISO Backstop Procurement Authority for Reliability Assessment

7. Other