

Stakeholder Comments Template

Submitted by	Company	Date Submitted
Nancy Rader (nrader@calwea.org)	CalWEA	November 3, 2015
Michael Goggin (mgoggin@aweaa.org)	AWEA	(updated deadline per CAISO)
Dariush Shirmohammadi (dariush@shirconsultants.com)	CalWEA	

Please use this template to provide your comments on the presentation and discussion from the stakeholder web conference held on October 19, 2015.

Submit comments to InitiativeComments@caiso.com
Comments are due November 2, 2015 by 5:00pm

The presentation discussed during the October 19, 2015 stakeholder web conference may be found on the [Frequency Response Initiative](#) webpage.

Please provide your comments on the ISO’s straw proposal for each of the eight issues listed below along with the ISO’s straw proposal. The ISO welcomes comments in addition to these issues as well.

Frequency Response Standard

The ISO believes the straw proposal and its accompanying technical appendix covers the standard’s requirements for compliance purposes. The ISO is endeavoring to provide sufficient information to stakeholders for effective evaluation of the ISO’s proposal. The ISO seeks comments on whether any unresolved questions on the standard and the ISO’s obligation still exist.

Comments:

CalWEA and AWEA agree with the basic framework of the CAISO strategy intended to assure the availability of sufficient primary frequency response (PFR) capability to address the reliability of its controlled grid by:

- 1) Obligating and incentivizing synchronous resources to provide their mandated governor response responsibility that is available and properly tuned at all times;¹ and
- 2) Developing market incentives or financial compensation mechanisms for asynchronous resources (variable energy and storage resources, etc.) to add PFR capability to their suite of services.

Furthermore, we agree with the CAISO's intent to implement this strategy in a two phase process whereby Phase 1 (consisting of activities that predate 2017) mainly focuses on part 1 of the CAISO strategy and Phase 2 (consisting of post-2017 activities) focus on part 2 of the CAISO strategy.

However, to help make the overall CAISO strategy more efficient as well as fair and equitable, CalWEA and AWEA recommend the following enhancements:

- a) CalWEA and AWEA recommend that all resources, including synchronous generators that have an obligation to offer governor response, be compensated for the provision of PFR. The payment mechanism should be similar to that used for providing regulation service ("performance payment" or "mileage payment"). A performance payment, coupled with the CAISO "non-compliance penalty" will incentivize all generators and particularly synchronous generators to not only ensure the availability of their governor response but also to tune the governor better (e.g., reduce governor deadband and/or the droop) to meet system needs.

¹ NERC (http://www.nerc.com/docs/pc/FRI_Report_10-30-12_Master_w-appendices.pdf) and others have documented that most conventional generators fail to provide sustained frequency response, in many cases because there is no economic incentive to provide this service. NERC has noted that only 70-75% of generators have governors that are capable of sustaining frequency response for more than one minute, and about half of conventional generators have controls that may withdraw sustained frequency response for economic reasons. Moreover, "Only 30% of the units on-line provide primary frequency response. Two-thirds of the units that did respond exhibit withdrawal of primary frequency response." Therefore, "Only 10% of units on-line sustain primary frequency response." In a statement to FERC, NERC (http://www.nerc.com/files/FinalFile_Comments_Resp_to_Sept_Freq_Resp_Tech_Conf.pdf) has directly attributed the decline in frequency response to changes in how conventional power plants are operated, with changes in the composition of electric demand being a secondary factor. NERC also forcefully exonerated renewable generation for the decline in frequency response, stating that "These changes [the decline in frequency response] have been evolving for some time and are not the direct result of the emergence of renewable resources such as wind and solar." In addition, analysis conducted for the CAISO identified no major concerns for frequency response in a transition to a high renewable future, finding that "None of the credible conditions examined, even cases with significantly high levels of wind and solar generation (up to 50% penetration in California), resulted in under-frequency load shedding (UFLS) or other stability problems" (<http://www.caiso.com/Documents/Report-FrequencyResponseStudy.pdf>).

As we noted before (see Footnote 1) CalWEA and AWEA believe that the governor response from synchronous generators, if provided at the levels these units are technically capable of providing at minimal cost, will remain sufficient to meet CAISO's PFR obligations even with deeper penetration of renewable resources. However, we also foresee that there will be low-load operating situations whereby the PFR obligation may necessitate the commitment of synchronous generators that would not otherwise be committed as part of the CAISO DA market activities. Such a reliability commitment would raise the cost of operation (and emissions) mainly by causing the curtailment of renewable resources due to an overgeneration condition. Hence, sufficient incentives or, better yet, PFR capability compensation should be offered to asynchronous generators so that they can add and offer PFR capability to the CAISO market. As a result, CalWEA and AWEA do not see any need to make the provision of PFR capability, even if fully compensated, mandatory for asynchronous resources unless future system operation trends prove otherwise.²

Frequency Response Drivers

Several factors contribute to the primary frequency response performance of participating generators having governors. The ISO discusses some of the main drivers of PFR performance in Section 4.2 of its straw proposal. These factors include (1) magnitude of frequency deviation,

² NERC (http://www.nerc.com/files/FinalFile_Comments_Resp_to_Sept_Freq_Resp_Tech_Conf.pdf) and other sources indicate that different resources face vastly different costs for providing frequency response service. For example, while nearly all wind projects have the technical capability to quickly ramp up their output and provide frequency response, under a wind plant's normal un-curtailed operating condition there is a major opportunity cost for doing so. Ensuring that a wind plant can provide an increase in output requires holding the plant below its current maximum potential output (as provided by the current wind resource) so that it can increase its output on command. This comes at the large opportunity cost of foregone production from zero emission and zero fuel cost wind energy for the entire duration the wind plant is providing this service. In contrast, holding a conventional power plant below its maximum output (a) saves the significant fuel cost associated with operating that plant at a higher level of output and (b) reduces air emissions, typically making them a more economic source for providing frequency response. Because of this and the fact that the decline in frequency response has been primarily caused by conventional generators reducing their frequency response contribution for economic reasons, namely the lack of payment for providing frequency response service, we believe that if a market-based payment mechanism were put in place sufficient frequency response service would be provided at very low cost. This market mechanism would use price signals to ensure that frequency response is provided by the resources that can cost-effectively provide this service. In contrast, requiring all generators to provide some level of frequency response would result in a highly inefficient allocation of the provision of the power system's need for frequency response service.

(2) amount of synchronous on-line capacity providing sustained PFR, and (3) headroom available from that connected on-line capacity.

The ISO is evaluating what additional data points would need to be included in its Masterfile or through other mechanisms to facilitate a market tool or product to be designed. The ISO seeks comments on what factors influence a generator's ability to provide PFR in the event of a frequency disturbance and the pieces of information necessary to estimate expected PFR.

Comments:

CalWEA and AWEA agree with CAISO on the main drivers supporting the availability of frequency response from synchronous generators. Given that beyond "synthetic inertia response," the PFR capability from inverter-based resources (asynchronous generators) is not yet well defined, we believe that a technical workshop with inverter-based resource manufacturers and other stakeholders will be beneficial in expanding the list of drivers to include those from asynchronous generators.

Phase 1, addressing real-time deficiencies

Section 6.2 of the straw proposal discusses Phase 1 of the initiative which will enact the five steps to ensure it is capable of meeting the requirement at that time. The first step discussed in section 6.2.1 is to develop "look-ahead" tools to assess the PFR capability of the system at various time horizons in the future based on current system conditions. If the look ahead indicates an anticipated deficiency of PFR the ISO can take actions to address the deficiency.

The ISO seeks comments on its proposal for addressing real-time PFR deficiencies for 2017 compliance period.

Comments:

As noted before, CalWEA and AWEA support CAISO's overall strategy in addressing primary frequency response in two phases. As we see it, for Phase 1 of this broad approach, the biggest factors for CAISO to consider is the magnitude of PFR requirement and CAISO's obligation to meet its share of the total magnitude. And this magnitude needs to be measured on a daily basis, once before the DA market and again between the DA and the FMM markets. The capability to meet the CAISO share of the requirement should become a constraint for the DA unit commitment and 15-minute market unit commitment processes. Only in this fashion will it be possible to ensure the availability of sufficient PFR from the CAISO footprint.

However, when it comes to addressing the capability question, it is essential that the share of PFR for each Balancing Area (BA) is correctly apportioned. This apportionment should be based on the effectiveness of the PFR from each BA in resolving the interconnection-wide PFR need – similar to generation curtailment to resolve emergency transmission overloads; it should not be based on the magnitude of load and generation within the BAs.

Phase 1, tariff and interconnection revisions

Section 6.2 of the straw proposal discusses Phase 1 of the initiative which will enact five steps to ensure it is capable of meeting the requirement at that time. The first step discussed in section 6.2.2 is to revise the tariff to include requirements for all participating synchronous generators with governors, not just those providing spinning reserves, to set governors to specified droop settings and deadbands, and to not override governor response through outer-loop controls or other mechanisms.

The ISO seeks comments on the tariff revisions it is proposing to help the ISO ensure sufficient frequency responsive headroom and whether other revisions should be considered.

Comments:

CalWEA and AWEA strongly support this part of CAISO proposal. At the same time, as we broadly presented in our response to the first question, CalWEA and AWEA believe that synchronous generators should receive a performance (mileage) payment after the provision of governor response (in addition to getting penalized for not providing their PFR obligation in sufficient magnitude) in order to better incent these resources to participate in the provision of governor response.

Phase 1, ISO's practice of preserving operating reserve headroom

Section 6.2 of the straw proposal discusses Phase 1 of the initiative which will enact five steps to ensure it is capable of meeting the requirement at that time. The first step discussed in section 6.2.3 is to revise the tariff to clarify the authority of the ISO to designate any reserve not previously identified as Contingency Only by a Scheduling Coordinator (SC) as Contingency Only reserves.

Comments:

CalWEA and AWEA support this part of the CAISO proposal. At the same time, we believe that if the actual unit commitment process is formulated to ensure sufficient PFR is available in the system there should be no need for taking such measures. However, until such time that the

need for PFR is not modeled in the DA and FMM unit commitment processes, we agree with CAISO that converting the contingency flag for all reserve capacity to Contingency Only flag will help ensure the availability of the needed FPR within the CAISO footprint.

Phase 1, performance requirements

Section 6.2 of the straw proposal discusses Phase 1 of the initiative which will enact five steps to ensure it is capable of meeting the requirement at that time. The first step discussed in section 6.2.4 is to include frequency response performance requirements for resources with governor control and frequency responsive capacity available.

The ISO will continue to develop the details of a proposed performance requirement and seeks comments from stakeholders on an appropriate performance requirement.

Comments:

Please note our response to the previous questions.

Phase 1, allocation of BAL-003-1 non-compliance penalties

Section 6.2 of the straw proposal discusses Phase 1 of the initiative which will enact five steps to ensure it is capable of meeting the requirement at that time. The first step discussed in section 6.2.5 is considering provisions for allocating any non-compliance penalties associated with BAL-003-1, should they be imposed on the ISO, to resources that should have provided more PFR than they actually delivered during frequency events.

The process discussed in ISO tariff section 14.7 applies to an allocation of any reliability-based penalty. The ISO seeks comment on how it could apply these tariff provisions to BAL-003-1 compliance and whether it should explore additional tariff provisions beyond those set forth in section 14.7 to impose responsibility for penalties on any resource that fails to provide primary frequency response for which it has an obligation to provide.

Comments:

As we noted before, CalWEA and AWEA fully support this penalty provision of the proposal.

Phase 2, long-term approaches

Phase 2 of the initiative will evaluate if a market constraint or product is better suited to competition for frequency response capability (Section 6.3 of straw proposal). Such market-based mechanisms could not be designed, approved and implemented by December 1, 2016, and therefore the ISO will need to consider them in a second phase of this initiative.

Comments:

Again, CalWEA and AWEA fully support the implementation of a market constraint to ensure the availability of sufficient PFR in the CAISO footprint. As we have also noted before, this market constraint should be combined with incentives to synchronous generators (performance payments) in Phase 1 and asynchronous generators (PFR capability payments and performance payments) in Phases 1 and 2 of the CAISO strategy to ensure the sufficiency of PFR from the CAISO BA.