Storage as a Transmission Asset

Stakeholder Comment Template

Submitted by	Company	Date Submitted
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Please use this template to provide your comments on the Storage as a Transmission Asset revised straw proposal that was posted on August 15, 2018.

Submit comments to InitiativeComments@CAISO.com

Comments are due September 4, 2018 by 5:00pm

The revised straw proposal, posted on August 15, 2018, as well as the presentation discussed during the August 21, 2018 stakeholder web conference, may be found on the Storage as a Transmission Asset webpage.

Please provide your comments on the revised straw proposal topics listed below, as well as any additional comments you wish to provide using this template.

Contractual Arrangement

The ISO proposes to develop a new agreement with SATA resource owners that captures elements from Participating Generator Agreement (PGA), Participating Load Agreement (PLA), Reliability-Must-Run (RMR) and Transmission Control Area (TCA) agreements. Additionally, the ISO has indicated its preference to control SATAs when they operate as transmission assets. Please provide comments on this proposal.

Comments:

1. **Ensure new contract doesn't discriminate against SATA**

The CRI team (Kerinia Cusick, Jon Wellinghoff and Lorenzo Kristov) supports developing a new agreement with elements taken from other existing contracts. As the ISO develops the pro forma contract, we simply ask that the ISO verify it isn't placing requirements on SATA resources that could be considered discriminatory. Discrimination detrimental to a SATA resource can take two distinct forms. Either SATA resources can be required to perform certain functions or meet certain standards which are not required of traditional transmission assets without a rational basis, i.e. independent of the operational characteristics of the resource. Or SATA resources can be required to operate or perform like traditional transmission assets in circumstances where the inherent characteristics of the SATA resource make it impossible or impractical to do so. In the latter instance consideration should be given to tailoring the business practice or tariff rule to accommodate the unique characteristics of the SATA resources as long as other critical operational parameters such as reliability and delivery of intended transmission services can be assured.

2. **Only enter into 40-year transmission contracts where there is a high degree of certainty regarding load peak and profile**

The ISO specifically asks for comment about the need to balance TPP rolling 10-year planning cycles against the different life expectancies of SATA resources (e.g., 10 years for batteries) compared to conventional transmission assets (i.e., 40 years), and the challenge of projecting SATA costs out three to four project cycles for an apples-to-apples comparison. The ISO's perspective on this question seems to be that the SATA resource, due to its shorter life span for some types of storage, has less value than conventional transmission because the latter can be implemented once and will serve for 40 years. CRI would argue instead that, in a climate of rapid change in the manner of energy delivery and provision of energy services, including changes in load characteristics, technology advancement, resource type, mix, and location, shorter-lived solutions provide substantial flexibility and offer option values that equate to significant ratepayer benefits. Thus shorter, 20 year or less, planning and resource depreciable lives, are more valuable to consumers than traditional longer 40 year lives.

The ISO's own explanations – about its inability to forecast market participation hours for SATA resources due to uncertainties in the inputs that drive transmission needs – underscore this point. If the factors driving a need for transmission services are subject to great forecast uncertainty, as they will likely be through the coming years of transition to a renewable energy power system, then in many instances ratepayers would be better served by solutions that will last for 10 years than ones that last for 40 years. CRI would argue, then, that a decision to build a 40-year asset with ratepayer funding should be taken only for those needs for which there is a high degree of certainty that the need will sustain for 40 years and there will be no regrets for investing in underutilized transmission capacity.

3. **Use 20-year contracts for SATA (20 years with option to cancel at year 10)**

Based on the above perspective, for the current initiative CRI suggests a 20-year contract term for SATA resources, structured as an initial 10-year term with a provision to renew for a second 10-year term if the need is confirmed in the TPP with sufficient lead time for the SATA owner-operator to perform any

needed replacement or refurbishment for the second term. For example, a battery storage system with manufacturer-specified 10-year life of the battery cells would be contracted for 20 years of transmission service, and the refurbishment costs after the first 10 years would be included in the cost of the SATA project for project selection purposes. The contract would also allow the ISO to cancel the second 10-year term if the TPP studies indicate the project's transmission service is no longer needed.[1]

CRI believes this approach has merit for the following reasons:

- As the ISO points out, the ISO TPP plans for a rolling 10-year window. A 20-year contract in two 10-year phases would give the ISO roughly 8-9 years before revisiting the same transmission reliability issue.
- A 20-year contract would only require projecting out cost for one additional, future project lifecycle, minimizing the probability of significantly over, or under, estimating future battery costs.
- As the ISO has mentioned, California is undergoing a significant change in load profiles, peak loads and generation mix. Shortening the planning lifecycle, and procuring assets with shorter life, benefits ratepayers by giving the ISO more flexibility.
- Accommodating SATA resources with a 20 contract with two 10-year phases recognizes that requiring SATA resource to conform to the traditional 40-year contract life of a conventional transmission asset would be discriminatory. Thus, this accommodation for the unique characteristics of SATA resources avoids that discriminatory result.

Transmission Revenue Requirement Capital Credit

The ISO has proposed a TRR capital credit to reduce a SATA resource's capital cost recovery. The objective of this credit is (1) to protect ratepayers from early degradation of SATA resources operational capabilities due to dispatches from ISO market participation and potential for reduced useful lifespan for a SATA resource's ability to meet the identified transmission need(s), and, (2) to ensure the SATA resource owner considers all marginal costs when bidding into the market. Please provide comments on the ISO's proposal and any potential alternative the ISO could consider to achieve the same objectives.

Comments:

CRI understands the ISO's objectives with the TRR credit requirement and appreciates the importance protecting ratepayers and the fidelity of the market bidding process by ensuring SATA owners bid their marginal costs. However, we believe the desired objectives can be achieved in a less complex and punitive manner, while also achieving a better result for both SATA developers and consumers.

[1] If the TPP finds that the transmission service of the SATA is no longer needed and the ISO cancels the second 10-year term, the more permanent features of the project (e.g., site infrastructure and interconnection facilities) could convert to a conventional energy-only generator interconnection agreement subject to the same performance specifications as the original SATA resource. If the resource owner-operator desires full capacity deliverability status it would face the same process as other energy-only resources seeking higher deliverability status.

1. Enforce contractual performance criteria versus implementing "TRR Credit"

The two objectives stated for instituting a TRR credit requirement can instead be achieved by the ISO relying upon its contract with the SATA owner-operator to ensure that assets perform as required for the duration of the contract. With effective contract enforcement ratepayers should not require any additional protection. Further, this will require the SATA owner-operator to internalize the cost of any asset degradation due to market participation, and thus create the right incentive to include the associated marginal cost in its market bids.

CRI believes that contract enforcement as described above will also address the concern of the SATA asset owner distorting market outcomes by bidding excessively low. Contract enforcement requires the SATA owner-operator to internalize the cost of any performance degradation resulting from market participation, which the owner-operator can convert into a marginal cost of market participation to be incorporated in the SATA's market bids.

With regards to protecting ratepayers from SATA asset owners willfully wearing down the SATA in order to make revenue in the market, the protection offered ratepayers through ISO's contractual provisions should be adequate, and any requirements above and beyond the contract are likely discriminatory. As highlighted in Section 8.1. of ISO's Revised Straw Proposal, the contract will include: 1) maintenance obligations; 2) performance obligations; 3) performance availability; 4) service availability; 5) monitoring for compliance; 6) non-performance penalties; 7) market participation obligation/restriction; 8) capital additions; and finally; 9) termination rights. The SATA asset owner will clearly be responsible to meet ISO's needs as defined in the contract or face penalties and termination. The asset owner will need to plan that any revenues earned in the market must be sufficient to cover the cost of ongoing refurbishment of SATA hardware caused by market participation.

So both objectives are effectively achieved by proper contract drafting and enforcement.

2. Developing an accurate "TRR Credit" value will be nearly impossible

Aside from there being a simpler alternative to the TRR credit mechanism for realizing the same objectives, CRI believes the TRR crediting approach has fundamental flaws that cannot be overcome. The first is the complexity of determining the appropriate value of the TRR credit. The second is the inability to overlay the TRR credit onto the ISO proposed cost recovery options without rendering those options infeasible.

To be accurate, the TRR credit would need to be specific to both the storage technology and the market service the asset provides. The O&M costs of pumped storage will not be similar to those of an electrochemical battery or flywheel. And a Lithium-ion battery would not be similar to a Vanadium flow battery. So the credit would need to be tailored to each and every technology. It will also be nearly impossible to apportion a percentage of O&M cost of supporting equipment such as inverters, HVAC, substations, etc. to transmission versus market operations. Finally, as mentioned, the TRR credit value would need to be market product application specific. Primary degradation factor of an electrochemical battery participating in energy market would be MWh, while a similar battery participating in frequency regulation would be number of cycles. There are even significant differences between ancillary services. For example, a battery proving 30-minute spin might not see any degradation, while another providing

frequency regulation would. And then imagine the additional complexity for a SATA resource that participates in multiple market services.

CRI suggests that this complexity should not be managed by the ISO but should instead be assigned to the SATA owner-operator by enforcing the contractual requirements for the asset to provide the specified transmission services over the term of the contract. The asset owner-operator will be the best party to determine any degradation of the asset due to market participation and then undertake whatever cost is necessary to fulfill its contractual commitments.

Additionally, CRI went through the effort of trying to apply the TRR credit approach to each of the currently proposed cost recovery options. In at least two instances it appears infeasible. For example, in Option 3 (revenue sharing), the TRR credit would also need to be prorated using the same ratio for revenue split. If not, it becomes an impossible barrier to market participation. An asset cannot be charged 100% of the cost to participate in the market but be allowed to only retain a portion of the revenue earned. In that scenario, the asset would rarely be bid into the market. It is also impossible to see how one would apply the TRR credit approach to Option 2 (partial cost of service). In that scenario, it is expected that SATA sponsors would bid a "net cost" which is lower than 100% of the SATA capital costs, discounting the SATA costs up front based on expected market revenues. As such, the "net cost" would have to reflect only the expected market revenue, and exclude the cost of operating in the market, otherwise the SATA sponsor would pay twice to participate in the market.

Market Participation

The ISO provided two additional options it is currently considering to notify SATA resources when they would be permitted to provide market services and access market revenues: Day-ahead market option and D+2 Option. Please provide comments on these options, including any preference or alternative options.

Comments:

CRI supports both the Day-ahead and the D+2 options. Additionally, CRI asks ISO to commit to evaluating, on a case-by-case basis in the context of the TPP, the possibility of providing further advance information to potential SATA sponsors regarding opportunities for market participation.

1. **Create standard process to determine what market participation data can be provided SATA asset owner-operators on a case-by-case basis**

CRI understands the rapid pace of change in California's generation fleet and the growth of distribution-connected energy resources, and appreciates the uncertainties the ISO faces in trying to provide SATA assets advance notification of the seasons/hours they can participate in the market over the life of the contract. CRI believes, however, that these uncertainties will not be the same in all areas of the grid. For example, in Section 8.2 of the revised straw proposal, the ISO says that an unforeseen natural gas plant retirement would impact its need for SATA transmission services. However, it is our understanding that this is an issue only in locations affected by the availability of a natural gas power plant, so that not all

transmission assets will be affected by this uncertainty. Moreover, the ISO has a process in place to forestall power plant retirement, namely RMR.

Similarly, the affects on load profiles and peak loads of various load modifiers, such as behind-the-meter solar PV, have locational characteristics that will be more or less significant for different transmission needs for which SATA resources are selected. Since the CEC updates these estimated impacts annually or biennially, the ISO should at least be able to analyze the CEC data and place reasonable confidence bounds around probability of releasing an asset to operate in the market on a rolling year-by-year basis. In addition, the sophistication of modeling tools and computer assets to produce model results are advancing rapidly. The ISO should not foreclose the option of providing more granular market opportunity data to SATA assets simply because doing so at this moment in time is difficult or in part infeasible.

In short, CRI suggests that the question of forecasting market participation availability for a SATA resource should not end with the conclusions reached in the present initiative, but should become a standard part of the ISO's planning process, particularly where a SATA or other non-conventional ATS looks like it may be the best solution.

Cost Recovery Mechanism

The ISO has proposed three alternative cost recovery mechanisms in the revised straw proposal:

1. Full cost-of-service based cost recovery with energy market crediting
2. Partial cost-of-service based cost recovery with no energy market crediting
3. Full cost-of-service based cost recovery with partial market revenue sharing between owner and ratepayer

Please provide comments on these three options and any other options the ISO has not identified. Please provide specific comments on (a) if the ISO should maintain option 2, above, and (b) why, if any, specific market profit threshold must be reached before the SATA resource would be permitted to retain some portion of profits and how such threshold should be determined.

Comments:

CRI continues to support Option 2 and asks that ISO continue to carry forward the option for the following reasons:

- CRI informally polled a number of competitive energy storage and transmission developers and found there is continued support for Option 2.
- As ISO notes, the two parties that have suggested it will not be financeable and ask that it be removed are SCE and SDG&E, two parties that will most likely never bid a project under Option 2. Competitive third-party providers, such as LSPower, who would conceivably bid under Option 2 in a competitive solicitation, have argued strongly for it.
- CRI agrees that ISO's inability to forecast market participation hours in essence precludes long-term bi-lateral contracts. Bi-lateral contracts would have facilitated participation from as many

parties as possible in the competitive process. However, eliminating bi-lateral contracts does not imply that projects bid under Option 2 automatically become non-financeable. In no scenario is there the expectation that a SATA will be financed by 100% merchant revenues. By definition, a SATA will at least be predominately used as a transmission asset and financed via a TAC under a TRR. Larger companies will have the ability to place a fraction of the SATA cost on their balance sheet or/or secure debt financing. It should be expected that initial bids submitted under Option 2 will only anticipate a small percentage of market participation and merchant revenue (e.g. 5%). However, as companies become more experienced and competitive opportunities for SATA and other ATS expand, the percent of merchant revenue will most probably increase.

- CRI disagrees that Option 2 is any more complex than Option 3 to implement in the ISO tariff, and ultimately, Option 2 will be the lowest cost solution for ratepayers.
- Option 2, not 3, is characteristic of ISO's encouragement of competitive solicitations and the fact that it puts as many opportunities as possible through the Phase 3 TPP competitive process. The ISO prides itself in encouraging competition. To take a solution forward to FERC, without including an option that encourages and enables competitive sponsorship of ATS over the long run, is contrary to ISO's approach to implementation of FERC Order 1000. It also appears to be contrary to the FERC Policy Statement on Cost Recovery by Electric Storage Resources[2] that clearly contemplates recovery by storage resources of costs from both market based sources and rate based sources with the same asset.
- The concern about potential SATA owners going bankrupt under Option 2 is false. ISO goes through an extensive pre-qualification process in Phase 3 of the TPP, which will weed out any financially weak parties.

Given that the ISO is a national leader in this area and would become the first ISO to allow an asset to receive both cost-of-service and market-based revenues, it is appropriate to allow more options and flexibility since both the ISO and industry are experimenting and learning together. Therefore, taking forward 3 options at this point seems appropriate. In a decade, real life experience in the field may show that one of the 3 options can be deleted.

Options in the event of insufficient qualified project sponsors

The ISO has proposed potential options for addressing SATA projects when there is insufficient qualified project sponsors. Please provide comments on these options, including preferences and/or additional alternatives that should be considered.

Comments:

CRI has no comments on this topic at this time.

[2] 158 FERC ¶ 61,051 UNITED STATES OF AMERICA FEDERAL ENERGY REGULATORY COMMISSION 18 CFR Part 35 [Docket No. PL17-2-000] Utilization of Electric Storage Resources for Multiple Services When Receiving Cost-Based Rate Recovery (Issued January 19, 2017)

Consistent with FERC Policy Statement

The ISO believes the revised straw proposal is consistent with the FERC Policy Statement. Specifically, that the straw proposal does not inappropriately suppress market prices, impact ISO independence, nor result in double recovery of costs. Please provide comments on the whether you agree or disagree with the ISO. If you disagree, please clarify why and how the ISO might address this issue.

Comments:

See comments above in **Cost Recovery Mechanism** section. Otherwise we do not disagree.

Other

Please provide any comments not addressed above, including any comments on process or scope of the Storage as a Transmission Asset initiative, here.

Comments:

CRI asks CAISO to anticipate that SATA sponsors will want to propose hybrid solutions (e.g. solar plus storage). Provided the sponsor commits to operating the combined resource within the same maximum power injection (Pmax), and the maximum power withdrawal limits of the right-sized pure SATA solution, CRI suggests the ISO should be indifferent to the combination of technologies used to meet the ISO requirements. As solar costs continue to decline, and with the potential for securing the ITC for the battery system when combined with solar, a hybrid solution may be the most cost effective solution for ratepayers.