Western Power Trading Forum
Comments on the CAISO's April 5th Phase 2 Discussion and Scoping White Paper
April 29, 2011

WPTF appreciates the CAISO's initiative on the Phase 2 issues and the opportunity to provide these comments. We first address the CAISO's specific requested areas of feedback followed by more specific comments.

Summary: WPTF summarizes the main themes of its comments herein.

1. In the short run, the CAISO should create market mechanisms to procure and/or price/value the MOC and Flexible Ramping Constraint, as these are tangible services the CAISO currently wishes to use for which no market-based design exists. The CAISO should focus on a rigorous analysis of what is needed by the CAISO, provide complete transparency on its requirements, and undertake dedicated exploration with stakeholders of possible market design attributes. We offer some suggestions for design considerations.
2. In the mid-term, the CAISO should work to identify those market design elements that the CAISO can use to build a dynamic portfolio of integration services that can be adjusted as required to offer the most cost-effective operational flexibility. The CAISO should also continue to pursue sub-hourly intertie scheduling which will itself tend to align the DA/HA/RT and in-state/out-of-state markets.
3. For the longer-term, rather than reaching for a comprehensive solution that may become stymied given the wide range of uncertainties, the CAISO should develop guiding principles that are consistent with its vision of "getting the spot markets right" to guide future modifications of market design as conditions change so that the CAISO is providing transparent information on the locational value of integration services that guide investment.
4. Regarding specifics, WPTF has provided a series of comments on the CAISO specific service proposals and policy questions.

A. <u>Phase 2 Proposed Plan</u>

The proposed plan for Phase 2 as outlined in the Introduction, including the idea of a comprehensive market roadmap and a subset of topics to address this year.

In the CAISO's April 5, 2011 Phase 2 Discussion and Scoping White Paper ("scoping paper") the CAISO identifies two objectives: (1) to develop a comprehensive framework or roadmap for the market changes that need to be designed and implemented over the next several years, and (2) to get target (presumably identify *and design*) market elements for board approval in late 2011 or early 2012.

Regarding the first of these objectives, of course it would be convenient to generate an ultimate solution and proceed consistent with that. However, we are realistic and have a strong desire to avoid the likely outcome of getting stymied while trying to identify a comprehensive solution for a problem that is unprecedented, rapidly changing, uncertain, and dependent upon many factors outside of the control of the CAISO and our stakeholder community. WPTF is concerned that the CAISO may not be acknowledging the full nature of the problem for which it suggests a comprehensive plan be generated given for example, that the specific renewable build out and transmission reinforcement charges are not yet known. WPTF's recommendation to expeditiously proceed with the design of market products, for which locational requirements can be dynamically adjusted as required based on integration requirements, will help mitigate the risk of these uncertain changes in operational requirement.

WPTF suggests that it would be appropriate is to develop a *vision* for the end state, including identifying the nature of the flexible tools that will be available to the CAISO for managing the grid as we expect it to change with renewable build-out. WPTF envisions market mechanisms whereby the CAISO obtains the spot services it needs from dispatch, procurement of optionality for services such as ramping and balancing services, and commitment, for example. WPTF also envisions that forward procurement of some nature would occur smoothly and easily if needed to ensure availability for those spot market characteristics once those spot markets are developed. For such services the CAISO would allow competitive price formation to reflect the value of the service would pay providers accordingly and would incent appropriate development of, and contracting for, supply and renewable system needs. WPTF encourages consideration of distinct products and encourages a general goal to reduce uplifts. While WPTF does not have a complete position established yet, we would support discussions on having energy prices reflect the costs of constraints enforced in the market (e.g., commitment and min-load costs) – for example as in an "extended LMP design" to the extent that separate products are not developed to meet system needs.

Similarly the scheduling of energy would move toward a closer alignment with the consumption of energy (e.g., sub-hourly intertie scheduling), and as a result the in-state and out-of-state markets could align. There are likely other similar design principles not articulated herein. The vision at this level should be transparent, competitively procured spot market products for all required services where such products can be reasonably designed, and the minimization of opaque, out-of-market mechanisms that increase uplift or obscure the value of required services. Such a vision can and should be adopted, irrespective of particularities of the outcomes of the assessment of future needs and design choices. As part of this process gaps between the vision and the expected future state, if any, could be addressed.

There are, however, needs that the CAISO anticipates, some of which may perhaps arise within the next 12 – 24 months. A first principle should be to focus on the specific product/service designs as a top priority for development of specific proposals for Board approval by the end of 2011 as part of this Phase 2 set of activities. The CAISO should work to fully evaluate the requirements for operating flexibility developed through the renewable integration studies and the operation of the MOC and flexible ramping constraints. Such activities represent "low hanging fruit" in pursuit of the vision proposed above. Whereas the CAISO scoping paper lays

a set of possible market changes, the set of items currently is more in the form of a "laundry list". For the CAISO's next paper it should work toward its recommendation regarding which offer the most value for implementing sooner rather than later.

Regarding the CAISO's #2 objective – the development of specific products/services/constraints for board action by ~ December 2011 – WPTF strongly recommends that the CAISO address replacement mechanisms for the non-market mechanisms instituted since MRTU start-up, in particular addressing minimum on-line constraints (MOCs) and the proposed flexible ramping constraint. These must be explicit and accompanied by price signals. It is imperative that the deficiencies with the two services the CAISO is either already taking or planning to take must be corrected on a very high priority timeline.

Resolution of these existing deficiencies alone could easily consume the balance of the Phase 2 activities for the balance of the year. Activities should include the CAISO providing additional detail about the use of the services/constraints (drivers, selection of resources, effectiveness of current mechanisms, benefits to the system of the service), discussions and analysis of possible valuation and pricing market designs, and illumination of the drivers behind the services/constraints.

Recapping, the highest priority for short run intensive activity is to implement market-based valuation and pricing mechanisms for the additional services the CAISO already takes or plans to take. In parallel the CAISO and stakeholders should investigate any understanding of the next most imperative constraints/service the CAISO expects to need. Lastly for the longer-run the appropriate action at this point would be to develop a vision and guiding principles. Going into more specifics for the long term "comprehensive" solution may likely be futile or misplaced given the rapid change and uncertainties.

B. Comprehensiveness of Phase 2 Issues and Roadmap

Is the list of topics and issues for consideration in Phase 2 and inclusion in the roadmap complete? If not, please identify others that should be included.

As indicated above, we do not believe that ensuring that the "laundry list" of possible solutions is as broad as possible is particularly useful beyond the very initial discussions that the CAISO has had. Certainly WPTF does not recommend a detailed development of options associated with each of the possible alternatives that the CAISO identified in its scoping paper. Instead CAISO and stakeholder activities should shift to identifying those alternatives that are believed to offer a flexible portfolio of reliability services to provide the required operational flexibility.

C. Prioritization

Which topics and issues should be high priority for addressing this year?

As detailed in A, above, market-based mechanisms for MOC and flexible ramping should be the highest priority for this year. In parallel, and necessarily on a longer-time horizon (because such discussions involve entities outside the CAISO footprint), but not at the expense of the previous objective, the CAISO should continue to pursue sub-hourly intertie scheduling as can be supported by WECC and market participants.

D. Other Comments

WPTF offers additional comments to the more narrow items as identified below.

Pay for Performance Regulation; PJM Regulation Design Changes:

WPTF would like the CAISO to address the following questions:

- Does the CAISO experience the same operational drivers that PJM described, namely a poor response rate potentially triggered by fast-ramping resources and longer-ramping resources not being distinguished? If not, how is the CAISO's situation different than PJM's?

- Does the CAISO believe such design changes would be effective for the CAISO situation? If so, how would the CAISO propose addressing the current separate Reg Up and Reg Down products, and what – if any –changes to the design would the CAISO recommend and why? And if this approach has potential from the CAISO's perspective, would these market changes offer minimal or significant improvement to the CAISO's operational flexibility?

- The CAISO recently obtained Board approval for Regulation Energy Management, after investment of significant staff time, which not only unavoidably delayed other work on market and product development for renewable integration, but which also represents a first step toward allowing new technologies to provide Regulation – does the CAISO intend to abandon REM?

If the CAISO does intend to change course on the next refinement of Regulation service, and to the extent the CAISO views PJM-style changes as holding significant potential, it would be helpful if the CAISO could post the design and stakeholder documents to which Andy Ott referred for the convenience and benefit of the CAISO stakeholders.

Changes to Hourly Intertie Scheduling:

WPTF believes it is a productive long-run initiative to increase the flexibility and responsiveness at the ties. Doing so could also facilitate alignment of the DA, HA and RT markets which would in turn finally treat in-state and out-of-state similarly. However, the CAISO's paper did not seem to articulate fully the dependency upon scheduling practices in WECC at large. WPTF recommends that the CAISO address this dependency in its next white paper and identify any

alternatives or actions the CAISO believes it could take separate from, or in advance of, WECC-wide scheduling practice changes.

Contingency Only Operating Reserves

Whereas WPTF expects there is some value to allowing contingency-only designations on an hourly basis, it seems potentially more important to revisit how the CAISO uses reserves generally, especially in light of possible other market design changes for operational flexibility. WPTF asks the CAISO to consider the more broad use of reserve energy prior to or within its next white paper.

Multi-settlement of AS

WPTF has been an advocate of the ability to buy back AS for example and thereby would generally be supportive of fully multi-settlement AS. WPTF does not, however, find a strong connection between this capability and the satisfaction of the CAISO's operating flexibility requirements for renewable integration. The CAISO should clarify if and how this is related to operational flexibility. Perhaps more importantly, WPTF suggests that the CAISO consider full multi-settlements for AS rather than just addressing the buy back issue, as doing so would provide a more complete mechanism for the market to adapt to changing market conditions.

RUC Enhancements

WPTF certainly supports improvements to the CAISO's ability to forecast needs given variable generation, providing that the CAISO offers transparency into any redesigned methods. WPTF would like further clarification on the extent of the benefits the CAISO would expect in the area of operational flexibility should RUC be integrated into the IFM. This should not be another mechanism to increase the capacity committed to meet obscured requirements for operating flexibility – so the basis for any modification of RUC requirement would need to be completely transparent.

Load/Gen Following

See WPTF's comments under "Contingency-Only Reserves" above as it may pertain to provision through existing Operating Reserve services. WPTF would be supportive of further consideration of this market design alternative to the extent that the CAISO believes it offers an efficient solution to its operational flexibility needs. Consistent with our comments above, we believe that the CAISO should begin to estimate the procurement target for each service given the anticipated flexibility needs. WPTF also asks the CAISO to begin to articulate whether needs are envisioned to manage hourly schedule-driven ramps, or unanticipated short-run variability as it seems that the drivers provide information about the relative value of such a following product.

WPTF also recommends that the CAISO provide additional information about the nature of the load/gen following requirements, in particular the extent to which the CAISO expects that such can be anticipated at the time of the DA market. To the extent reservation needs can be anticipated at the time of the DA then the procurement of resources may produce a more efficient market solution. If not procured within the DA the CAISO will, it seems, be faced with issues associated with pricing given that currently there are no settlements associated with

RTPD runs. Furthermore, procuring this service only in RTPD will preclude provision by medium-start time units. Similarly, currently there is no settlement for internal generators during HASP. Most importantly, while the CAISO indicates that waiting until after the DA IFM run would "allow the CAISO to determine requirements for load-following reserves after the outcome of the IFM and RUC processes". [p. 11] WPTF notes that procurement in the DA IFM would also be informed by the balance of the solution and that it is not technically necessary to *wait* until the IFM is complete for the computations to "know what happens in the IFM".

We also want to confirm that while the CAISO in its scoping paper indicates that: "At the same time, some of the changes currently in progress such as the flexible ramp constraint will effectively better ensure sufficient load-following capacity" [p. 11], that the CAISO is committed to creating market mechanisms for the ramping services. In other words, the CAISO should not view the ramping constraint as something that alleviates the need for developing the required services. In fact, the use of such a constraint should elevate the priority of seeking to implement appropriate market mechanisms.

Regarding procuring the following service in the monthly or annual auction, WPTF believes that this is a separate question that relates to how to procure a well-defined commodity for which a spot market has already been established. Once the product is defined, the CAISO can evaluate alternatives for designing competitive procurement mechanisms, which may include long forward procurement, which WPTF agrees may reduce the overall cost of the following service. If long forward procurement is an impractical means of obtaining certain operational flexibility, then the CAISO must nevertheless create a spot market to procure any remaining following service (potentially following needs not anticipated in month- or week-ahead). Therefore, while we support consideration of this option, it is premature to view this as an *alternative* to a daily procurement.

Frequency Response

The CASIO scoping paper provides a brief discussion on system inertia and frequency response. WPTF first wishes to understand better whether these elements are conjoined. Frequency response is both a regional (California) and broader WECC requirement/service. The CAISO should clearly identify the intended focus of this issue. Moreover, the CAISO should specify the type of frequency response it requires. All synchronous machines are capable or providing some measure of frequency response. However, large conventional machines are uniquely capable of providing frequency response service within a few seconds. As discussed further below, inertia, while also a factor in the provision of frequency response, also plays a key role in supporting imports in Southern California. Especially in light of the CAISO's recent focus on supporting measures necessary to support and increase import capability (especially for new renewable resources), a specific focus on the role on inertia for supporting imports appears reasonable. More specifically, the CAISO should focus on how, to explicitly model and price the SCIT nomogram in the CAISO market software or otherwise transparently price the provision of this important service. WPTF encourages the CAISO to consider whether frequency response and inertia should bifurcated and addressed separately and to explicitly identify the nature and value of these distinct services.

System Inertia

WPTF appreciates the CAISO's willingness to explicitly address system inertia issues, as this has seemingly been a long-standing area of need within the CAISO to some level or another. WPTF requests more information/transparency about the potentially enormous implications for system stability of the changing composition of the generating infrastructure – for example, some information about the role of inertia in the SCIT nomogram has apparently been removed from the CAISO website. The CAISO should publish much more information on the role of inertia and the CAISO's requirements for SCIT, for example, as part of the immediate activities supporting Phase 2.

WPTF notes that the CAISO has referred to a study with GE anticipated to be completed in July and we agree that such a study will aid in our understanding of the system needs. However, WPTF does not see any need to wait until the outcome of the study to discuss the market design and compensation of such market services. In fact, we expect that the CAISO is already knowledgeable of the role of inertia-and the implications of the resource planning scenarios being considered in the renewable integration studies that could be used as indicative of the requirements for such services.

WPTF asks the CAISO to include in its next RI Phase 2 paper some discussion of inertia needs as it sees them today and alternatives for market designs, including addressing the overlap of the types of services intertia provides (e.g., frequency response and facilitating Southern California imports). The need for this examination is self-evident and timely. As the CAISO is acutely aware, the potential replacement/retirement of Once-Through Cooling (OTC) generation is being examined in a number of forums (The State Water Board OTC process, the CPUC LTPP, the CEC/SCAQMD AB1318 process). OTC generation located in the LA Basin provides most if not all of the inertia required to support imports into Southern California. New renewable resources in or around the LA Basin or elsewhere in Southern California do not and cannot provide the requisite amount of inertia to support Southern California imports.

MOCs

As indicated above in Part A of our comments, WPTF strongly supports movement to market-based compensation for MOCs given the CAISO's need to consider these needs in the market runs.

On one level compensation for MOCs seems very straight forward as the CAISO could simply implement subregional spinning reserve procurement for its MOC needs. This would result in the incremental value of the MOCs being provided via the spinning reserve payments.

The CAISO should clarify any distinctions between the nature of the requirements met through MOCs and the service provided by Spinning Reserve. WPTF presumes the CAISO believes the use of Spinning Reserve is problematic for two reasons. First the CAISO seems to believe that there is insufficient competition to ensure competitive pricing for the services.[1] Secondly, it

[1] The CAISO wrote [p 14]: "The MOC does not lend itself to a spot market product because only specific resources are able to resolve the constraint…" However, the CAISO has not provided any specific data to demonstrate this conclusion.

seems the CAISO has historically found it inappropriate to secure 10-minute reserves for this reliability need.

To the first issue, WPTF believes it critical to provide to stakeholders information about the level of competitiveness or these services. If collectively market participants and the CAISO determine that the provision is uncompetitive then it may necessitate the establishment of an administratively set compensation, through such mechanisms as bid controls or contract-based procurement, for example. Such a mechanism must however, allow providers the ability to earn the scarcity value of the services their resource provides given that absent the generator the CAISO would need additional generation built or perhaps significant transmission system upgrades. Nevertheless, the need for narrower sub-regional AS procurement for some of the CAISO's further reliability/flexibility needs seems likely, and as a result it seems may be an advantageous time to discuss ways to mitigate market power without unreasonably diluting the scarcity price signals when sub-regions are shown to be uncompetitive.

To the second issue, if the CAISO continues to believe that the use of 10-minute reserves for this need is "overkill" then we ask the CAISO to provide a critical assessment of the relative merits of implementing a similar 30-minute reserve product. If a parallel 30-minute product can satisfy this need then implementation of such would seem no more complex than the AS services already implemented.

In any event, we presume that the MOC service is a contingency-type reliability service, that is that the MOCs protect against certain reliability situations – either protecting against the loss of certain elements and/or that they maintain voltage. In this case, provision of MOCs seem no different than other reliability-related reserve services, for which the CAISO selects providers based on bids and sets clearing prices based on the marginal bid plus any opportunity value. Focusing on system or opportunity cost only for compensation seems to fail to reflect the market value of the capacity or voltage support reliability service being provided. The CAISO's scoping paper seems short-sighted in this respect in that it proposes primarily an energy opportunity cost only compensation.[2]

To a specific point in the scoping paper, the CAISO in its paper indicates that it may be appropriate to establish a pricing mechanism for any MOC that is "regularly binding at high capacity levels". WPTF questions the appropriateness of this statement, and we believe that the MOCs should always be explicitly treated even if at times the price of the constraint is zero. That is, we presume that the MOCs were implemented because the CAISO believes that they regularly do bind and/or because it is important enough to ensure sufficient capacity is available that the ISO believes it necessary to include such a constraint even if the frequency of binding is low. Assuming this is the case for even one MOC then a mechanism with explicit pricing as we've alluded to above with our recommendation for a locational reserve solution. Based on the type of procurement mechanism it may be the case that when the constraint does not bind the settlement implications are inconsequential (e.g., the AS reserve sub-regional premium would be zero). For example, the procurement of the MOC seems similar to the procurement of spinning reserves in a sub-region that mirrors the MOC area. Yet the sub-regional constraint

[2] The CAISO states [p 14]: "…potentially an opportunity cost could be calculated that reflects the commitment of higher cost resources in the SMEC for all resources."

should be active *a priori* and not *ex ante* based on some assessment of the ongoing frequency with which it binds.

Lastly, the scoping paper suggests to some extent that the RA program might be a right place to address MOC requirements. WPTF believes that the CAISO should as a first priority establish spot market mechanisms to procure needs. That should incent forward contracting – either through CPUC RA requirements or otherwise. We believe, however, that RA requirements without an ISO spot procurement mechanism do not work. For example it would depend upon something like CPM as a fall back. As a result we discourage an approach that primarily intends to address MOCs through the RA program.

Imposing changes on the RA program to obtain operating flexibility would be complicated because not all operating characteristics the CAISO might require (fast ramping, voltage support, inertia, start time, operating range) can be objectively prioritized on a year-ahead or multi-year-ahead basis. Different operating conditions, load levels and what network elements are out for maintenance require different capabilities at different locations. Additionally, action to impose requirements for operating flexibility (however that is defined) on the RA program would place the burden directly on LSEs, diminishing the role of the CAISO spot markets in properly pricing and assigning the cost of spot market treatment required. In any event, the CASIO must publish more information on how the MOCs are specified and used so that an objective assessment of what transparent spot market products might be established instead, for example information such as: are the constraints uniformly specified in terms of on line MW of capacity, or are they defined in MW-sec of inertia, or some other measure, is the locational granularity variable or fixed, how often do they bind, what are the shadow prices and how should they be interpreted, what are the changes in commitment and dispatch when they do bind, can they change commitment and not be binding, and if so how can their impacts be made transparent in such circumstances.

Flexible Ramping Constraints

WPTF addressed priority-related issues with Ramping Constraints (RCs) in Part A above and herein we offer some additional technical comments. The CAISO has designed the interim RC as a RTPD-invoked mechanism and states that doing so allows incorporation of up to date information, WPTF questions the appropriateness of this approach in the long run. Again, there is no current settlement process for RTPD (or HASP for internal generators), and as such it is unclear what market prices would be set for this service if procured only in RTPD. Compensation – potentially based on some market opportunity value – may be useful to suppliers but would not alone provide the right price signals within the market.

WPTF also questions whether procurement in RTPD to address forecast variability is necessarily the most efficient procurement method. For example, procurement in advance (e.g., in DA) would increase the pool of resources that could provide the ramping ability in RT and may also provide an overall more efficient provisional mix (e.g., with DA energy and ancillary services). WPTF notes that the CAISO's Technical Bulletin on flexible ramping indicates that the CAISO may in the future consider applying it in the day-ahead market.

In addition to addressing the lack of existing RTPD settlements capabilities, WPTF would like the CAISO to provide further information about (1) the limitations on the pool of available resources that results from an RTPD-only procurement and (2) further information about the extent to which over time the CAISO expects to be able to predict the ramping needs in advance of RTPD. That is, will not the CAISO find patterns over time that could standardize the additional ramping capacity needs?

Cost Allocation

WPTF continues to believe that the appropriate cost allocation policies can be more effectively designed as the services and the intended procurement methods are resolved. However, the CAISO has asked for input on cost allocation from a principled perspective with the stated aim of providing conceptual guidelines that can be applied as the RI process moves forward.

WPTF consistently advocates for cost allocation based on cost-causation principles. "Cost causation" is short-handed phrase that is easily applied when the party or action that caused the cost to be incurred is clearly known and easily associated with the costs. The goal under cost causation is to place the burden such that the most appropriate party is financially motivated to avoid the events or actions that cause the costs to be incurred. Aligning the incentives is a key element of ISO markets and of the CAISO's MRTU markets.

If the CAISO is to adopt a principle we would advocate that it be this: allocate costs so as to create the best incentives that will result in an economically efficient investment decisions and cost assignment. .

Applying this principle for RI is not at all straight forward. Further if we endeavor to say ahead of time either that load should pay for all costs or generators should pay for all costs there is a possibility that we will miss opportunities to provide the most efficient incentives. It is for this reason that WPTF believes that we must first determine what the services are that the CAISO needs, what the market mechanisms are to procure the services, and how the resulting payments are designed. Through this process we need to understand what is driving the need for them and determine how the CAISO will set the levels of each and what drives the cost of the services in the markets. Through this process we can then determine the extent to which it is possible to relate the needed services to any particular sector. Only after this point will it be possible to make the policy decisions about what incentives are created if the costs are assigned to load or if the costs are assigned to some other sector. As part of this parties can explore past policy decisions (e.g., that regulation costs are assigned to load) and consider whether it is efficient to deviate from this historic allocation.

It is already evident to WPTF based on available information that not all of the CAISO's operational flexibility costs should be shifted to renewables. The CAISO's need for MOCs clearly predates the expansion of variable resources. Similarly its RC seems to some extent needed to manage the fact that the CAISO's HASP process produces only hourly block schedules at the ties – also irrespective of variable resources. If certain services or certain levels of CAISO procurement can be deemed to be needed to manage variable energy resources, then WPTF would also recommend a process that looks at the VERs' ability to reduce the need for such costs if those costs were to be allocated to that sector.

In short, WPTF recommends a principle of establishing cost allocation policies that best align financial incentives for controlling costs and considering historically-adopted methods where we cannot show that any particular party or sector has the ability to effectively reduce the costs if such were assigned, or where such costs would have no bearing on the relative efficiency of investment alternatives, and we advocate for a clear recognition for a critical examination of the drivers of the ISO procurement of services before establishing specific cost allocation processes.