SWP's comments on revised Straw proposal on Standard Resource Adequacy Capacity Product

December 18, 2008

The California Department of Water Resources State Water Project (SWP) appreciates the opportunity to provide comments to the California Independent System Operator (CAISO) on its revised straw proposal entitled "Standard Resource Adequacy Capacity Product" dated December 4, 2008. SWP participated in the December 11 stakeholder meeting conducted by the CAISO/MSC for discussion on the revised CAISO straw proposal. SWP respectfully submits following comments / questions to the CAISO on the straw proposal:

SWP recognizes three major issues embedded into the straw proposal that have significant impact: 1) Standard Capacity Product (SCP) tags; 2) Performance standard including availability target for the RA resources; 3) Clarification issues.

Before going to these issues SWP would like to highlight a potential flaw in the resource adequacy resource scheduling / bidding design under MRTU. The MRTU tariff section 40.6.8 requires a RA resource that is not a Use Limited Resource (ULR) to offer all of its RA capacity into the CAISO market for 24 hours. Otherwise, the CAISO software will insert "generated bids" for that non-ULR for the hours it did not offer provided the resource is not in outage. An LSE may have enough RA ULRs to cover for certain hours of a day because of use limit nature and would probably need some other non-ULRs to cover for other hours when ULRs are not available as required by tariff section 40.6.8. In that case, the non-ULRs may not be in real outage and if the non-ULR is offered for hours not covered by ULRs, the software will generate bids for the non-ULR for hours not offered. This would make the ULR capacity redundant or ineffective as a RA resource. Although the tariff provisions are there to provide ability for ULRs to be counted as RA resource, this situation would prevent ULRs from being an effective RA resource. The example in Table 1 illustrates this problem for LSE2 (resource SR3).
If reserve sharing LSEs are subject to RA obligation for RA peak hours only during which reliability is a concern, the problem associated with tariff 40.6.8 will not exist.

1) Standard Capacity Product (SCP) tag attributes:

The straw proposal defines SCP tags as:
SCP Tag *{Resource ID, RA capacity MW≤NQC, Month}*
This tag with three attributes as proposed can not accommodate resources that are potential RA resources for only certain hours of a day although Use Limited Resources (ULR) are allowed to offer only for certain hours according to the tariff. The notion that once RA capacity is procured the same capacity is for 24 hours of a day does not capture the resources that are available or can be made available only for some hours of a day.

Table -1

LSEs For "January" 2010	Local RA obligation	Local RA resource IDs, MW and daily available hours	Compliance Local RA	System RA obligation	System RA resource IDs, MW and daily available hours	Compliance System RA
LSE 1	40 MW	"LR1"=40 MW; HE01-HE24	Yes; one resource is available for 24 hrs	240 MW	"SR1"= 200 MW; all hours Plus "LR1"	Yes; one resource is available for 24 hrs
LSE 2	40 MW	"LR2"=40 MW; HE01-HE12 "LR3"=40 MW; HE13-HE24	Yes; two resources available half time covering a whole day	240 MW	"SR2"=100MW HE01-HE24 "SR3"=100MW(ULR) HE12-HE24 "SR4"=100 MW HE01-HE11 Plus "LR2", "LR3"	Yes; three resources available covering the whole period

In the Table-1 two identical LSE1 and LSE 2 are shown. LSE1 makes RA compliance with just two resources where as LSE2 makes compliance with two or more resources that are available in temporal basis for a day thus covering the availability for the whole day. The CAISO proposed tag only addresses LSE1 but not the LSE2 because the tag attribute is not on temporal basis but monthly. If the SCP tag includes monthly as well as daily and hourly attributes, the LSE 2 could have been supported for its compliance the way it does in the above table. To address the LSE 2's way of compliance, SWP proposes the SCP tag as following:

SCP Tag *{Resource ID, RA capacity MW≤NQC, Year range (yy-yy),Month range (mm-mm), Day range (dd - dd), time range (HE.-.HE..}*

Example in Table-1: The LSE 1 uses following tags of 240 MW covering January 2010 for full RA compliance:

["LR1", 40MW, 09-09,01-01,01-31,HE01-HE24]
["SR1", 200MW, 09-09, 01-01, 01-31, HE01-HE24]

The LSE2 uses following tags of 240 MW covering January 2010 for full RA compliance:

["LR2", 40MW, 09-09,01-01,1-31,HE01-HE12]
["LR3", 40 MW,09-09, 01-01, 01-31, HE13-HE24]
["SR2", 100MW,09-09,01-01,01-31,HE01-HE24]
["SR3", 100MW,09-09,01-01,01-31,HE12-HE24]
["SR4", 100MW,09-09,01-01,01-31,HE01-011]

LSE1 (RAR=240 MW) for January 2010, all days (hours of days in the display)

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
"LR1" for all hours=40 MW (local)																							
"SR1" for all hours=200 MW (system)																							

LSE2 (RAR=240MW) for January 2010, all days (hours of days in the display)

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
"LR2"=40 MW (local)												"LR3"=40 MW (local)												
"SR2"=100 MW (system)																							
"SR4"=100 MW (system)												"SR3"=100 MW (system)-ULR											

The CAISO can validate above plans reconciling days and hours of the month and the required capacity and the RA resources for a particular LSE. The SWP proposed tag design also addresses the LSE1 which is submitting plans according to the CAISO proposed SCP tag.

Pros of SWP proposed SCP tag design:

1) Provides flexibility in counting resources for RA in temporal basis: Use Limited Resources (ULR) as RA resources are exempt from 24 hours availability requirement. However, an LSE that uses ULRs as RA resources that are available only for, let's say, super-peak hours (HE15-HE19), may still need other resources to cover for the rest of the hours for which those ULRs are not available, in order to satisfy its on-peak demand as RA compliance for the whole day. The LSE may use either ULRs or non-ULRs that are available for hours other than super-peak hours to meet its on-peak demand. This temporal flexibility does not exist in the CAISO proposed tag. With the CAISO tag design, the LSE2 would have procured total of (40+40+100+100+100=380 MW) capacity to satisfy its obligation of 240 MW. This could be expensive for LSE2. In addition, if they are non-ULRs, all 380 MW would have to be offered for 24 hrs to satisfy RA requirement of 240 MW except for the ULR, "SR3".
2) Provides room for trades of excess RA capacity on temporal basis: LSEs that have excess generation capacity may sell or trade excess capacity on temporal basis on any day and any hour. LSEs can shop around for capacities based on their requirement rather than buying capacity from the same resource for a whole month or a year. With the CAISO proposed tag, LSEs may not opt for buying on-peak only capacity from ULRs because they can not be available for 24 hours; they would rather choose to buy from resources that are available for 24 hours. The CAISO SCP tag would preclude on-peak capacity available from such resources because capacity procured from non-ULR on top of capacity from ULR would need to be offered 24 hours. In example, LSE2 uses ULR resource "SR3". However, with the proposed design, non-ULR resource "SR4" needs to be offered for 24 hours including the hours covered by the ULR ("SR3"). So why would LSE2 procure ULR resource "SR3"? LSE2 would look for resources like "SR2" only that are available for 24 hours. So, the proposed design eliminates participation of resources like "SR3" and "SR4" in the RA capacity market.

3) Sends price signal: CAISO proposed tag undermines the price signal for RA capacity. Just as on-peak and off-peak energy price varies by hour, so does the capacity. This concept is addressed by the SWP proposed tag. Entities can trade tags at varying prices depending on the hour they need.

4) When no load exists, no RA resource should be forced to be available: It may be possible that for an LSE load at a local area during some days or months may not exist or for an LSE total load may be zero during off-peak hours. In such case, making RA resource available is just an unnecessary burden for the LSE. This tag avoids that situation.
5) The tag attributes itself contains the expected availability taking into account the outages except forced outages.
6) Expected availability can be updated intra-monthly for ULRs linking to the Use Plan.
7) Outage replacements: outage units can be replaced with the tag intra-monthly.
8) Addresses multi-year commitments.
9) Enhances the very purpose of capacity market design i.e. pave the way for selling excess capacity efficiently.
10) Question of uniformity of tag: The tag is not uniform because of varying durations. This should not limit the ability of trading capacity. Buyer can buy the needed capacity for the hour it needs from the seller. Buying and selling of capacity would rather be efficient based on varying prices with season or time.

Cons of SWP proposed tag:
MRTU requirement of RA resource to be available for 24 hours except for ULRs is a challenge. If the RA resource is bid or self-scheduled for a few hours of a day unless it is an ULR, the CAISO automatically inserts "**generated bids**" for the rest of the hours if the resource is not in an outage. If a RA resource (non-ULR) is planned for only a certain hours of a day and the CAISO inserts bids for the remaining hours of the day, this proposed tag would be inconsistent. If the CAISO modifies the requirement of 24 hrs scheduling for the same resource and replace by LSE's portfolio RA compliance (supplier can schedule any hour the resource is deployed as a RA resource and cover the whole day with sufficient RA capacity from different resources for the LSE; like LSE 2 in example), then this tag should work. Alternative to this for the SWP proposed tag to work would be to consider outage code for hours when non-ULR is not offered as a special type of outage such as "supplemental RA" in order to avoid insertion of generated bid.

2) Availability target and the performance standard:

SWP notes that in the revised straw proposal, the CAISO has abandoned setting the past five years average availability as the target availability. The new proposal is to consider RA fleet availability for the past year and make a single standard. However, no formula has been created as to how to calculate the target availability. SWP would like to see how the new proposal would fit hydro resources including hydro generating units and pumping loads. Specifically, these resources for SWP depend on the water demand, hydrologic conditions, and environmental constraints. With respect to the Use Limited resources availability target and performance standard SWP proposes as following.

1) If SWP proposed tag is used: the target availability should be measured every month. The target availability is the hours displayed in the tag for the month.

Availability measurement may be monthly or annually. Threshold for penalty may be the ICPM proposed 95% of the target. "Forced is forced" concept should remain. Bonus for better than target performance should be established.

2) If the CAISO proposed tag is used: SWP would like to see the formula that will be used in calculating the target availability for the CAISO's new proposal on target availability. Alternatively, the target availability should be the monthly submitted expected availability hours (taken into account maintenance and overhaul outage) along with the monthly RA plans (availability derived from the most recent updated intra-monthly or monthly forecast for ULRs). ULRs availability is uncertain and the more close to the compliance month, the better is the availability forecast. "Forced is forced" concept should remain. Availability for ULRs should be updated with the intra-monthly update of Use Plans. Bonus for better than target performance should be established.
3) When there is no load during the compliance month in the updated forecast that was accounted for in the annual RA plan or monthly RA plan, the RA resource serving that load should not be required to be available. The SCP design should be inclusive of this provision.
4) The straw proposal uses "SLIC Outage" as the measurement parameter for performance for each resource. RA compliance with respect to the requirement is to measure whether the resource has been offered (bid or self-scheduled) or not rather than whether the unit has been reported as outage. All the RA resource that has been offered (bid or self-scheduled) may not be committed in IFM or RUC and how "SLIC Outage" applies to such un-committed RA resource is an issue to look at. In the example, RA resources for LSE2 can be tracked for their "offer (bid or self-schedule)" during the compliance month. The "offer" hours can be counted and assessed against the availability target set in the tag and performance standard can be assessed. Measures may have been in place for dispatched RA units for tracking their performance just like any other committed units. It appears that for the sake of simplicity the CAISO is focusing on the SLIC outage. SWP has no objection as far as such outages considered for measuring performance do not equate to the outages that are not equipment failures. In the December 11 SCPM presentation, the CAISO provided a formula for calculating monthly availability from a resource which is as follows:

$$Ajn = \frac{\sum \text{Hourly RA MW Available from Resource j}}{(\text{Total RA MW of resource j}) \times (\text{Total compliance Hrs of Month})}$$

Above proposed formula does not consider allowance to forced outages due to reasons other than equipment failures such as fuel shortage etc. In order to account for such outages in the availability formula, the formula should be modified as:

$$Ajn = \frac{\sum \text{Hourly RA MW Available not in SLIC outage} + \text{Hrly RA MW with SLIC outage (forced fuel/environ/no load)} + \text{Hrly RA MW with SLIC outage ("Supplemental RA Unit") during the RA peak hours from Resource j.}}{(\text{Total RA MW of resource j}) \times (\text{Total compliance Hrs of Month during RA peak hours})}$$

5) Outage representing forced outages other than equipment failures are due to "fuel shortage" (no pumping for pseudo generators) or other constraints such as "environmental factors" and operational constraints, and RA resource not being offered for hours when there will be "no load" to be covered by the LSE; Outage code representing "supplemental RA Unit" is to address the problem due to tariff section 40.6.8.;

6) Performance should be measured only for "RA peak hours (as proposed by the CAISO)"1 for penalties rather than for all hours. "RA peak hours" should be the focus of RA compliance rather than 24 hours. ***For reserve sharing LSEs RA must offer obligation should be limited to these "RA peak hours" only***. This would eliminate the problem associated with the tariff 40.6.8. "RA peak hour" is the time period for which reliability is a concern. It makes sense to make RA resources to be available to meet on-peak demand during on-peak period. However, making the same amount of capacity from the RA resources to meet the lower off-peak demand is an inefficient requirement. For example, to meet 100 MW on-peak demand an LSE shows 115 MW supply RA resource. The same LSE has 50 MW off-peak demand and asking the LSE to offer 115 MW RA capacity during off-peak hour to meet its 50 MW demand is an inefficient requirement. At most, the LSE could be required to meet its own demand by equal supply (not as an RA resource) during off-peak period because the off-peak hour is not capacity constrained in the CAISO market.
7) With regard to penalties for performance, the CAISO can provide the MW capacity and hours the resource was not offered (or SLIC outage) for the month discounting the forced outages as suggested in the formula above. The traders of the capacity can determine themselves the price the buyer would get back from the non-performing capacity without disclosing the price of bilateral capacity transaction to the CAISO. Physical derates for the ULRs should not be applied because their performance is dependent on several uncertain factors and the past records does not represent the upcoming compliance year.

3) In addition to above two major design issues, SWP has following clarification items:

1) At section 3.1 (Current Resource Adequacy Framework: Use Limited resources), the proposal indicates that hydroelectric resources are not required to be registered. Such statement should be in-line with the tariff[2] which includes participating load also for exemption.

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[1] April *through* October – HE14-HE18
Nov-Dec-January- *through* March - HE17-HE21

[2] **40.6.4.1 Registration of Use-Limited Resources.**
Scheduling Coordinators for Use-Limited Resources, other than for hydroelectric Generating Units and Participating Load, including Pumping Load, must provide the CAISO an application in the form specified on the CAISO Website requesting registration of a specifically identified resource as a Use-Limited Resource. This application shall include specific operating data and supporting documentation including, but not limited to;
(1) a detailed explanation of why the resource is subject to operating limitations;
(2) historical data to show attainable MWhs for each 24-hour period during the preceding year, including, as applicable, environmental restrictions for NOx, SOx, or other factors; and

2) The section 3.1 further indicates that Use Plan for Hydro can be updated intra-monthly. This statement should be in line with tariff[3] which includes pumping load as well.
3) The section 3.1 of straw proposal states that Hydro, pumping load, and non-dispatchable ULRs are not committed in RUC process, but they should offer into RUC if available. This is confusing. If such resources are not committed in the RUC process then why should they be required to be offered for RUC?
4) The straw proposal in the flow chart, indicates that exemption from offering every hour applies to ULRs and Extremely Long Start resources. Does this exemption apply to RA Imports with multi-block hour bids? i.e. can imports be made as an RA offer for those block-hours only?

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(3) further data or other information as may be requested by the CAISO to understand the operating characteristics of the unit.
Within five (5) Business Days after receipt of the application, the CAISO will respond to the Scheduling Coordinator as to whether or not the CAISO agrees that the facility is eligible to be a Use-Limited

[3] **40.6.4.2 Use Plan.**
The Scheduling Coordinator shall provide for the following Resource Adequacy Compliance Year a proposed annual use plan for each Use-Limited Resource that is a Resource Adequacy Resource. The proposed annual use plan will delineate on a month-by-month basis the total MWhs of Generation, total run hours, expected daily supply capability (if greater than four hours) and the daily Energy limit, operating constraints, and the timeframe for each constraint. The CAISO will have an opportunity to discuss the proposed annual use plan with the Scheduling Coordinator and suggest potential revisions to meet reliability needs of the system. The Scheduling Coordinator shall then submit its final annual use plan. Scheduling Coordinators for Use-Limited Resources must submit the proposed and final annual use plans in accordance with the schedule set forth in the Business Practice Manual. The Scheduling Coordinator will be able to update the projections made in the annual use plan in the monthly Resource Adequacy Plans. Hydroelectric Generating Units and Pumping Load will be able to update use plans intra-monthly as necessary to reflect evolving hydrological and meteorological conditions. The annual use plan must reflect the potential operation of the Use-Limited Resource at a level no less than the minimum criteria set forth by the Local Regulatory Authority for qualification of the resource.