Multi-Stage Generation (MSG)
Stakeholder Meeting

March 14, 2011
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<thead>
<tr>
<th>TIME</th>
<th>TOPIC</th>
<th>PRESENTER</th>
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<tbody>
<tr>
<td>9:00 a.m. – 12:00 p.m.</td>
<td>Current Status – Questions/Answers</td>
<td>Li Zhou</td>
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<tr>
<td>12:00 p.m. – 1:00 p.m.</td>
<td>Lunch break</td>
<td></td>
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<tr>
<td>1:00 p.m. – 2:00 p.m.</td>
<td>Participant Requested Enhancements</td>
<td>Alva Svaboda</td>
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<tr>
<td>2:00 p.m. – 3:00 p.m.</td>
<td>ISO Proposed Enhancements</td>
<td>Li Zhou</td>
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MSG Process

Janet Morris, Director
Program Management Office
Ongoing MSG Activation Process

Registration
• Following the third MSG activation window, MSG resources may be activated for any trade date subject to 16 business days for processing of the MSG registration.
• Opting out (reverting from MSG to FOR) requires a minimum of 5 business days for CAISO to process.

Testing
• One week testing intervals will be planned with each monthly release, occurring three weeks prior to the second Tuesday of the month.
• External testing will be conducted in the MAP-Stage environment.
• At least one settlement statement will be offered during that testing interval.
• Further testing requests will need to be coordinated in advance with the ISO.
Overview of MSG Production Experience

Li Zhou, Senior Adviser
Power Systems Technology Development
MSG Production Experience Overview (Issues addressed since MSG production in Markets)

- We have addressed the following issues at the Market site
  - A Binding transition decision / Start-up not recognized and observed by subsequent RTPD and RTD runs
  - Proper handling of SLIC outage/re-rate in both RTD and RTPD
  - Proper exceptional dispatch recognition in both RTD and RTPD
  - External DOPs/DOTs during transition
  - MLC adjustment due to self schedules
MSG Production Experience Overview (Pending Issues in MSG production in Markets)

• We are addressing the following issue at the Market site
  – Maximum Daily Transition not recognized by RTPD (already recognized by IFM) – Fix is being tested but not in production yet. Expected to be in production the week of 03/14 – 03/18.
MSG Production Experience Overview (Some System Level Information on MSG)
MSG Production Experience Overview (Some System Level Information on MSG)

![Graph showing real-time clearing in different configuration than self-scheduled](image-url)
MSG Production Experience Overview (Some System Level Information on MSG)

![Graph: Da Cleared Mwh / Rt Cleared Mwh]

- X-axis: Date from 12/7/2010 to 3/2/2011
- Y-axis: Mwh
- Two lines: DA_Cleared_Mwh and RT_Cleared_Mwh
MSG Production Experience Overview (Some System Level Information on MSG)
MSG Production Experience Overview (Some System Level Information on MSG)

![Number of Daily MSG Transitions Chart](chart.png)
MSG Production Experience Overview (Issues addressed since MSG production in Settlement)

We have addressed the following issues at the Settlement site:

-- Mismatches of ADS Configuration IDs and Expected Energy Configuration IDs. They are due to one of the four following reasons,
  1. RTM not passing the correct Active Configuration ID
  2. Inconsistent Configuration ID between RTD and RTPD
  3. EDE SLIC logs were not reflected in the respective Configuration ID
  4. MQS EDE DOP correction process not creating the respective Configuration

-- Day-ahead MLE revenue in IFM BCR amount

-- Self commitment extension regarding whether there is SS at the Plant Level for Different Configuration
MSG Production Experience Overview (Pending Issues since MSG production in Settlement)

Not directly related to MSG resources, we are currently addressing two issues:

-- Several run issues with expected energy and allocation. Mainly performance related;
-- DOP correction process. It sometimes does not create the records correctly which result in incorrect expected energy
MSG Production Experience Overview (Question/Answer based)

• Objectives
  – Review CAISO’s unit commitment and dispatch logic
  – Review various scenarios and expected outcomes
  – Review some expectations for Market Participants
  – Review settlement scenarios
  – Review CAISO plan and Market Participant’s inputs for MSG model enhancement
Question 1: If an Ancillary service self provision (ASSP) is provided for a given configuration, can and how ISO market applications honor that self provision in a different configuration?

Answer: Yes. Both DA/RT ASSPs are considered at plant level,
1. The ASSP on a submitted configuration will undergo the capacity, ramping and regional qualifications as it is;
2. The qualified AS capacity will be then transferred to the other AS qualified configuration but limited by the certified capacity of the transferred configuration for that service;
3. After the capacity and ramping will be carried out on the transferred configuration using their capacity limits and ramp rates;
4. Optimization will evaluate those configurations to determine.
Question 2:
Can a day-ahead awarded AS be observed at a different configuration that can support that capacity in real-time?

Answer: Yes. As long as the other configuration can support that Day-ahead AS. A day-ahead AS is first becoming a real-time self provision on the same configuration in real-time. After it becomes a real-time self provision, the transfer process in answer to question 1 will be used to evaluate other configurations.
Question 3: What are the reasons that a day-ahead awarded AS is disqualified in real-time?

Answer: In general, if the day-ahead awarded configuration AND other bid-in configurations can not support the AS due to SLIC or other changes, the day-ahead AS will be partially or entirely disqualified. The qualification rules are the same as non-MSG resources except the configuration level ramp rates and capacities are used instead. Additionally, if real-time determines the MSG to transit to another configuration, the AS during the transition ramp time will be disqualified when energy prices are extreme.
Question 4: What will be the settlement rule for disqualified AS?

Answer: AS settlement is on plant level. Same as for non MSG resources, the real-time AS disqualification for MSG resources will be used to increase the real-time AS obligation for allocation of real-time AS cost.
MSG Production Experience Overview (Question 5 – Real-time Self schedule VS day-ahead AS)

Question 5: Can a MSG resource have a real-time energy self schedule on a configuration different from the day-ahead awarded AS configuration, assuming the other configuration can support the AS?

Answer: Currently we do not allow that. A real-time self schedule or self provision can only be submitted on the day-ahead awarded configuration. Reason is to ensure that the day-ahead AS is protected. Like to see market participant’s inputs on the need to relax this.
Question 6: Currently, SCUC can provide DA energy, which is within the forbidden zone during transition hours for MSG resources. Even though this DA solution is theoretically correct, the solution is not credible for plant managers since it does not meet forbidden-zone Constraints?

Answer: When transition ramp time is greater or equal to 30 minutes between two non-overlapping configurations, the DA schedule during the transition can be within the gap between configurations. This will not be the case in real-time. Like to see market participant’s inputs on this.
In the following questions/answers 7 to 10, all numbers and graphs are based on the Pmin and Pmax of the configurations.

Question 7: Let C1 be the configuration from which the transition is starting and C2 the configuration to where the transition is ending. C1 has the operating range PMin1 and PMax1 and C2 the operating range PMin2 and PMax2 such that PMin1 = 20, PMax1 = 100, PMin2 = 120, PMax2 = 200 and Transition ramp time (C1-> C2) = 120 minutes.

• How is the transition profile computed?
• Which configuration is the transition profile applied to?
• What are the ADS DOTs/DOPs and the Expected Energy calculations during transition?
• How is the transition profile computed?

Answer: The transition profile is calculated as the linear ramp from 100 to 120 with ramp time of 120 minutes. There are some differences between day-ahead and real-time:
1. For DA, there are two hour’s day-ahead schedules to be at 105 and 115 MWs during the transition ramp time;
2. For RT, the transition profile is used for interval imbalance calculation. The external (ADS) DOTs/DOPs remains at 100 for Two hours at C1 until the end of transition.
MSG Production Experience Overview (Question 7 – Transition Profile UP for non-overlapping transition)

- Which configuration is the transition profile applied to?

Answer: The transition profile is considered between a from configuration and a to configuration. If the question is about which configuration we assume the unit is on, then the answer is that, we assume the unit is on from configuration until transition is finished. In this example, C1.
Question: What are the ADS DOTs/DOPs and the Expected Energy calculation during transition?

Answer: The external (ADS) DOTs/DOPs remains at 100 for Two hours at C1 until the end of transition. A vertical DOP jump (similar as startup/shutdown) from 100 of C1 to 120 of C2 will be assumed at the end of transition for expected energy calculation purpose. Therefore, during the transition, the expected energy is calculated using the C1’s real-time energy bid and other data AND it is also allocated to the C1’s real-time energy bid. The algorithm to calculate expected energy and allocation is the same as non MSG, except that the bid curve and relevant data is from configuration.
MSG Production Experience Overview (Question 7 – Transition Profile UP for non-overlapping transition)

For expected energy calculation and allocation during transition, the real-time bid curve and limits and other data of config 1 are used to calculate real-time expected energy and allocation. Config 1d is the MSG config 1. Same as the real-time minimum load cost/startup cost if applicable.

After the transition, the real-time bid curve and limits and other data of config 2 are used to calculate real-time expected energy and allocation. Config 1d is the MSG config 2. Same as the real-time minimum load cost/startup cost if applicable.
Question 8: Let C1 be the configuration from which the transition is starting and C2 the configuration to where the transition is ending. C1 has the operating range PMin1 = 20, PMax1 = 120, and C2 the operating range PMin2 = 100, PMax2 = 200 and Transition ramp time (C1 -> C2) = 120 minutes.

- How is the transition profile computed?
- Which configuration is the transition profile applied to?
- What are the ADS DOTs/DOPs and the Expected Energy calculations during transition?
MSG Production Experience Overview (Question 8 – Transition Profile UP for overlapping transition)

- How is the transition profile computed?

Answer: The transition profile is assumed to be flat as 110 MW (the mid point of the overlapping range) for the two hours during transition. For both DA and RT, the energy schedules will be assumed at 110MW of C1 for those two hours.

- Which configuration is the transition profile applied to?

Answer: The same as the non-overlapping configurations. It is assumed at the from configuration C1.
MSG Production Experience Overview (Question 8 – Transition Profile UP for overlapping transition)

- What are the ADS DOTs/DOPs and the Expected Energy calculations during transition?

Answer: The ADS DOTs/DOPs stay as 110MW at C1 for two hours until the transition is finished. The DOTs/DOPs before the transition is at C1 and the DOTs/DOPs after the transition is at C2. Therefore, during the transition, the expected energy is calculated using the C1’s real-time energy bid and other data AND it is also allocated to the C1’s real-time energy bid. The algorithm to calculate expected energy and allocation is the same as non MSG, except that the bid curve and relevant data is from configuration.
MSG Production Experience Overview (Question 8 – Transition Profile UP for overlapping transition)

For expected energy calculation and allocation during transition, the real-time bid curve and limits and other data of config 1 are used to calculate real-time expected energy and allocation. Config Id is the MSG config 1. Same as the real-time minimum load cost/startup cost if applicable.

After the transition, the real-time bid curve and limits and other data of config 2 are used to calculate real-time expected energy and allocation. Config Id is the MSG config 2. Same as the real-time minimum load cost/startup cost if applicable.
Question 9: Let C1 be the configuration from which the transition is starting and C2 is the configuration to where the transition is ending. C1 has the operating range PMin1 and PMax1 and C2 the operating Range PMin2 and PMax2 such that PMin1 = 120, PMax1=200, PMin2=20, PMax2=100 and Transition ramp time (C1-> C2) = 120 minutes.

• How is the transition profile computed?
• Which configuration is the transition profile applied to?
• What are the ADS DOTs/DOPs and the Expected Energy calculations during transition?
MSG Production Experience Overview (Question 9 – Transition Profile Down for non-overlapping transition)

• How is the transition profile computed?

Answer: The transition profile is calculated as the linear ramp from 120 to 100 with ramp time of 120 minutes. There are some differences between day-ahead and real-time:
1. For DA, there are two hour’s day-ahead schedules to be at 115 and 105 MWs during the transition ramp time;
2. For RT, the transition profile is used for interval imbalance calculation. The external (ADS) DOTs/DOPs remains at 120 for Two hours at C1 until the end of transition.
MSG Production Experience Overview (Question 9 – Transition Profile Down for non-overlapping transition)

- Which configuration is the transition profile applied to?

Answer: The transition profile is considered between a from configuration and a to configuration. If the question is about which configuration we assume the unit is on, then the answer is that, we assume the unit is on from configuration until transition is finished. In this example, C1.
MSG Production Experience Overview (Question 9 – Transition Profile Down for non-overlapping transition)

• What are the ADS DOTs/DOPs and the Expected Energy calculations during transition?

Answer: The external (ADS) DOTs/DOPs remains at 120 for Two hours at C1 until the end of transition. A vertical DOP jump (similar as startup/shutdown) from 120 of C1 to 100 of C2 will be assumed at the end of transition for expected energy calculation purpose. Therefore, during the transition, the expected energy is calculated using the C1’s real-time energy bid and other data AND it is also allocated to the C1’s real-time energy bid. The algorithm to calculate expected energy and allocation is the same as non MSG, except that the bid curve and relevant data is from configuration.
For expected energy calculation and allocation during transition, the real-time bid curve and limits and other data of config 1 are used to calculate real-time expected energy and allocation. Config Id is the MSG config 1. Same as the real-time minimum load cost/startup cost if applicable.
Question 10: Let C1 be the configuration from which the transition is starting and C2 is the configuration to where the transition is ending. C1 has the operating range PMin1 and PMax1 and C2 the operating range PMin2 and PMax2 such that PMin1 = 100, PMax1=200, PMin2=20, PMax2=120 and Transition ramp time (C1-> C2) = 120 minutes.

• How is the transition profile computed?
• Which configuration is the transition profile applied to?
• What are the ADS DOTs/DOPs and the Expected Energy calculations during transition?
How is the transition profile computed?

Answer: The transition profile is assumed to be flat as 110 MW (the mid point of the overlapping range) for the two hours during transition. For both DA and RT, the energy schedules will be assumed at 110MW of C1 for those two hours.

Which configuration is the transition profile applied to?

Answer: The same as the non-overlapping configurations. It is assumed at the from configuration C1.
MSG Production Experience Overview (Question 10 – Transition Profile Down for overlapping transition)

- Which configuration is the transition profile applied to?

Answer: The transition profile is considered between a from configuration and a to configuration. If the question is about which configuration we assume the unit is on, then the answer is that, we assume the unit is on from configuration until transition is finished. In this example, C1.
What are the ADS DOTs/DOPs and the Expected Energy calculation during transition?

Answer: The external (ADS) DOTs/DOPs remains at 110 for Two hours at C1 until the end of transition. Therefore, during the transition, the expected energy is calculated using the C1’s real-time energy bid and other data AND it is also allocated to the C1’s real-time energy bid. The algorithm to calculate expected energy and allocation is the same as non MSG, except that the bid curve and relevant data is from configuration.
MSG Production Experience Overview (Question 10 – Transition Profile Down for non-overlapping transition)

For expected energy calculation and allocation during transition, the real-time bid curve and limits and other data of config 1 are used to calculate real-time expected energy and allocation. Config Id is the MSG config 1. Same as the real-time minimum load cost/startup cost if applicable.

After the transition, the real-time bid curve and limits and other data of config 2 are used to calculate real-time expected energy and allocation. Config Id is the MSG config 2. Same as the real-time minimum load cost/startup cost if applicable.
MSG Production Experience Overview (Question 11 – Energy settlement when DA and RT are different configs)

Day-ahead energy will be calculated based on Configuration 1’s economic limit, Pmin and other relevant data. It will be allocated to the day-ahead energy bid on configuration 1.

Real-time energy will be calculated based on Configuration 2’s economic limit, Pmin and other relevant data. It will be allocated to the real-time energy bid on configuration 2.
So in CMRI, you will see,

1. Day-ahead energy associated with the day-ahead committed configuration (config 1 in our example);
2. Real-time energy associated with the real-time committed configuration (config 2 in our example).

There will be cases in which a real-time energy is not associated with any configuration ID in CMRI. This is because of two reasons we know:

1. No commitment in RT even it is committed in DA. In this case, RT energy is assuming the RT bid from the DA configuration;
2. Because of telemetry, there can be one non-zero DOP before the first non-zero DOT interval.
MSG Production Experience Overview (Question 12 – No config ID for TEE)

Question 12: Should 0 MW TEE value have a configuration ID or not. CAISO is currently leaving these points blank since that data point does not correlate to any actual configuration but it is still a required field and may be causing trouble for vendor software.

Answer: For the same reason stated in answer to question 11, when a unit is not committed in real-time, TEE will be zero and hence no configuration ID is given. Again, the real-time bid curve is assumed to be the real-time bid curve from the day-ahead committed configuration.
MSG Production Experience Overview (Question 13 – How is SLIC Pmin re-rate handled?)

Question 13: Let C1 has the operating range PMin1 and PMax1 and C2 the operating Range PMin2 and PMax2 such that PMin1 = 120, PMax1=200, PMin2=20, PMax2=100. Assuming that the unit is dispatched and running at 50MW (C2) and there is a plant re-rate to 150MW,

• How to report this in SLIC?
• How does RTD handle this situation?
• How does RTPD handle this situation?
How to report this in SLIC?

Answer: The Pmin re-rate has to include the following information explicitly:
1. Resource level Pmin re-rate to 150MW;
2. Configuration 1 Pmin re-rate to 150MW;

Note: The MSG resource owners are expected to report exactly what the resource and each configuration can do in an outage, re-rate or de-rate event. CAISO does not derive or imply any potential implication.
MSG Production Experience Overview (Question 14 – Why exceptional dispatch energy is generated while not in ADS)

Question 14: Explanation on where Exceptional Dispatch data is coming From when it is not present in ADS.

Answer: Exceptional Dispatch data not present in ADS comes from verbal EDEs that are logged in SLIC and entered manually as part of our post-process before the T+5 EE/EEA/AUX calculation. Such dispatch instructions are issued by our operations in real-time by phone and hence there is no ADS record in this. Same situation can happen for non MSG resource.
MSG Production Experience Overview (Question 15 – Emergency change to the Market Operations BPM for MSG)

Question 15: There was an emergency change to the Market Operations BPM for MSG the day MSG went live on 12/7/10, can CAISO provide an updated document that summarizes what the differences are from the original BRS document.

Answer: The emergency change in market operation BPM does not conflict with the original BRS. It provides a lot more design and implementation detail as to how to achieve the business objectives stated in original BPM. For example, the AS qualification logic described in this presentation is also described the Market Operation BPM. This detail was not known or detailed enough at the time of the BRS development. However the need of AS disqualification is all along stated in the BRS.
Question 16: How does CAISO qualify and allocate a transition cost with regards to commitment type, commitment period and metered energy?

Answer: There are three steps in this determination within a market:

1. A transition cost is considered eligible for BCR if it is related to a transition decision in which the to-configuration is “ISO committed”;
   1.1. For a transition from a bid-in configuration to a self scheduled configuration, the transition cost is NOT qualified;
   1.2. For a transition from a self scheduled configuration to a bid-in configuration, the transition cost is qualified;
   1.3. Determination of ISO or self commitment on the to-configuration is similar to the non MSG, which relates to energy self schedules, AS self provision, etc.
2. A qualified transition cost is then allocated to settlement intervals within the ISO commitment period of the to-configuration. For example, if a transition cost is $1000 and the to-configuration’s ISO commitment period is 2 hours. Then for each settlement interval within those two hours, the to-configuration is allocated transition cost as $1000 / 12.

3. For each settlement interval, the meter is compared to the Pmin of the to-configuration. If it is within the tolerance band, that particular allocated amount ($1000 / 12 in our example) will be included in BCR.
## MSG Enhancements with no policy impact

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<th>Enhancement/Change</th>
<th>Business Impact</th>
<th>Externally Visible</th>
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<tbody>
<tr>
<td>Include transition ramp time when considering minimum up time constraint of the from configuration (Day-ahead and Real-Time)</td>
<td>This will allow the MSG unit to better model their inter-temporal constraints. Due to the fact that transition ramp time is variant based on transition, current behavior makes it hard for them to choose a MUT.</td>
<td>Y</td>
</tr>
<tr>
<td>RTPD needs to consider telemetry – Currently RTPD does not take the telemetry into consideration for MSG resources. RTD does recognize the telemetry.</td>
<td>This allows RTPD to be able to make a better decision in case of non compliance, early startup/shutdown or transition.</td>
<td>N</td>
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<tr>
<td>MSG DA schedule consistency across day boundaries. Currently as an interim solution, we require market participants to bid in the configuration for HE1 of next trade day if that configuration is committed at HE24 for the prior trade day. This enhancement is to make IFM able to transit to the HE1 bid-in configuration from a different configuration based on initial condition if it is physically possible based on registered transition matrix. MPs do not have to bid in the same configuration in HE1 once this is done.</td>
<td>This will eliminate the need for market participant to bid in the configuration for the first trading hour of next day IF it is committed at that configuration at HE24 the previous day.</td>
<td>Y</td>
</tr>
<tr>
<td>Extension of the terminal condition to consider configuration level minimum down time when making transition decisions.</td>
<td>This will allow the MSG resources with long transition notification time to be able to move to the configuration committed in day-ahead without being moved to another configuration that makes the transition no longer feasible.</td>
<td>Y</td>
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## MSG Enhancements with no policy impact

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<th>Business Impact</th>
<th>Externally Visible</th>
</tr>
</thead>
</table>
| Requested By Market Participants,  
Submission of the Actual Configuration in Real-time from ADS or EMS  
As in the first go-live of MSG implementation, real-time application uses the state estimator or telemetry values to guess which actual configuration the plant is operating on. This is problematic when the MSG resource has multiple configurations overlapping each other. This problem will need to be addressed before we extend the MSG model to other areas including the aggregated pumps and aggregated pump storages.  
CAISO will need to work with market participants to develop a way either through telemetry or ADS for market participants to communicate the actual configuration in real-time to CAISO. This communication will need to happen no less than 5 minute frequency to facilitate the No Bid and Compliance functions in RTM | This will allow accurate configuration to be used in dispatch. Especially important when configurations are overlapping. | Y                 |
| Requested By Market Participants,  
New Inter-Temporal Constraints (Tariff change needed)  
As in the first go-live of MSG implementation, we observe the minimum up time and down time on configuration level and the maximum daily transition per directional transitions. During the late stake holder implementation workshop, market participants have indicated that, the actual constraints they are facing is the physical unit level minimum up time. This is due to the manufacturer’s warranty.  
This will be better described by a 3X1 combined cycle plant. In this example, each Gas Turbine has a minimum up time of 8 hours. So it is fine to move the MSG resource from offline to 1X1 configuration, then to 2X1 and then to 3X1. But it will be problematic to transit from 2X1 to 1X1 too soon since it will imply that one of the GTs has to be shutdown.  
CAISO has reached agreements with market participants that, for the first go-live, the minimum up time and down time on configuration level and the maximum daily transition per directional transitions will be used to model the physical constraints to a large extent. However, this will not complete the solution. A complete solution will be needed to operate the MSG resource correctly and is also important when we extend MSG to other areas including aggregated pumps and pump storages. | Allows the physical unit level constraint to be modeled 100% for the combined cycle unit. | Y                 |
**MSG Enhancements with possible policy and tariff impact (Policy Stake Holder planned in Fall 2011)**

<table>
<thead>
<tr>
<th>Enhancement/Change</th>
<th>Business Impact</th>
<th>Tariff/Policy</th>
<th>Externally Visible</th>
</tr>
</thead>
<tbody>
<tr>
<td>1). Bids for non-RA resources in RTM with DA award. SIBR shall enforce the bids to be available for all configurations below the DA schedule even the DA scheduled configuration is startup-able.</td>
<td>This will solve a lot of operation problems for RTPD/RTD. Having the full capacity range bid-in (lower configurations) is important to be able to move the unit arounds economically.</td>
<td>Tariff/Policy</td>
<td>Y</td>
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<tr>
<td>2). SIBR rule changes to tighten real-time bid submission including support of DA awarded AS or sufficient bids to allow transition across trading hours. Similarly to item B, SIBR shall enforce the lower configurations to be bid in.</td>
<td></td>
<td>Tariff/Policy</td>
<td>Y</td>
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<tr>
<td>3). Whenever a capacity is offered, the MSG resource shall offer the entire capacity range underneath that capacity.</td>
<td></td>
<td>Tariff/Policy</td>
<td>Y</td>
</tr>
<tr>
<td>Requested by Market Participants, Transition Cost registration – Formula needs to be revised (Policy change required)</td>
<td>This will allow market participants to able to capture their true cost of transition. Currently, the formula is too limited.</td>
<td>Tariff/Policy</td>
<td>Y</td>
</tr>
<tr>
<td>Extension of the Real-time limit on maximum number of configurations (Tariff change required)</td>
<td>This will further help the MSG resources with bigger number of configurations. It also helps CAISO since there are more choices to move in case of under-gen or over-gen.</td>
<td>Tariff Only</td>
<td>Y</td>
</tr>
<tr>
<td>-- Change to &quot;Max of 5 configurations - regardless of DA or RUC awards”? -- Or, consider eliminating limit, but enforcing new limit on the transition matrix. Max number of transition paths from a configuration</td>
<td></td>
<td>Tariff Only</td>
<td>Y</td>
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