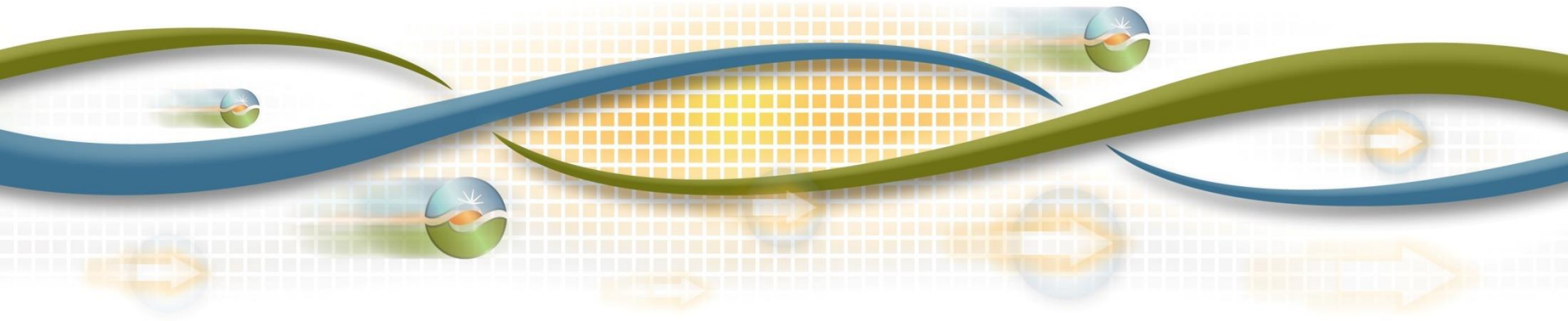




Regional Resource Adequacy Initiative

Working Group Meeting: Maximum Import Capability, Import RA Resources, and Uniform Counting Rules

July 20, 2016



Agenda

Time (PST)		Topic	Presenter
10:00-10:10	1	Introduction	Kristina Osborne
10:10-11:00	2	Maximum Import Capability (MIC)	Chris Devon
11:00-11:20	3	PG&E views on MIC proposal	PG&E
11:20-12:00	4	Internal RA Resource Substitution with External Resources	Chris Devon
12:00-1:00		Lunch	
1:00- 2:00	5	Discussion of Import Resources Qualifying for RA	Chris Devon
2:00-3:55	6	Uniform Counting Rules	Karl Meeusen
3:55-4:00	6	Next Steps	Kristina Osborne

Maximum Import Capability Background

Chris Devon

Senior Infrastructure Policy Developer

Maximum Import Capability (MIC) background

- **MIC process already considers and protects existing contractual rights and pre-existing commitments**
- Will allow the ISO to protect existing arrangements and allow these practices to continue without impacting those arrangements of potential new entrants
- ISO will account for existing arrangements and practices that are established under firm transmission rights and contractual obligations
- 13-step allocation process currently allows LSEs to nominate portions of their overall allocations on the interties on which they seek a specific allocation of import capability

MIC process – calculation and import allocations

- “Import Deliverability” is assigned every year to LSEs:
- **Assignment of RA import capability to LSEs** – MIC on each intertie is available to LSEs for procuring RA capacity from external resources; it is not assigned directly to external resources
- **Process for allocating MIC to LSEs** – Steps 2-13 in Tariff Section 40.4.6.2.1, Available Import Capability Assignment Process
- **Annual determination of MIC** – (Step 1) MIC values for each intertie will still be calculated annually for a one-year term

MIC calculation background

- **Historically Based**

- Select 4 hours by choosing 2 in each one of the last two years (and different days within the same year) with the highest total net import level when peak load was at least 90% of the annual system peak load
- The average of net import schedules (0 MW is assigned when net imports are negative) + the average of unused ETC (adjusted for future year availability) technically should represent the Maximum Import Capability (MIC) for each tie
- In order to assure that all pre-RA import commitments (already paid by ratepayers) are allowed to count for RA until they expire, an uplift is added to the above established methodology for certain branch groups and this higher number is published and divided among LSEs as MIC

Available Import Capability Assignment Process

13 Steps in Tariff Section 40.4.6.2.1

Step 1	Determine Maximum Import Capability (MIC)
	Total ETC
	Total ETC for non-ISO BAA Loads
Step 2	Available Import Capability
	Total Import Capability to be shared
Step 3	Existing Contract Import Capability (ETC inside loads)
Step 4	Total Pre-RA Import Commitments & ETC
	Remaining Import Capability after Step 4
Step 5	Allocate Remaining Import Capability by Load Share Ratio
Step 6	CAISO Posts Assigned and Unassigned Capability per Steps 1-5
Step 7	CAISO Notifies SCs of LSE Assignments
Step 8	Transfer [Trading] of Import Capability among LSEs or Market Participants.
Step 9	Initial SC Request to ISO to Assign Remaining Import Capability by Intertie.
Step 10	CAISO Notifies SCs of LSE Assignments & Posts unassigned Available Import Capability
Step 11	Secondary SC Request to ISO to Assign Remaining Import Capability by Intertie.
Step 12	CAISO Notifies SCs of LSE Assignments & Posts unassigned Available Import Capability
Step 13	SCs may submit Requests for Balance of Year Unassigned Available Import Capability

Maximum Import Capability Calculation Methodology

Proposed change to MIC calculation

- Slight MIC calculation methodology adjustment is needed for use in **limited circumstances**
 - Reflects situations where new areas joining the ISO serves peak load conditions that normally occur during a non-simultaneous season compared to the rest of the system **AND** when there are no simultaneous constraints between those certain areas of an expanded ISO BAA
- Current MIC methodology without this change would needlessly restrict downward the MW amount that can actually be reliably achieved for certain branch groups that are mainly used to serve the peak load in new areas that peak non-simultaneously

MIC calculation change would only be used in limited situations

- Is only to be used when needed in order to avoid restricting the seasonal nature of the peaking timeframe that is used to set MIC values on each intertie
 - Winter peaking area would naturally observe highest import levels during the peak and would need that level of MIC in order to serve their individual peaking needs
- Intended to capture truly maximum reliable MIC values where certain areas have different seasonal peaking characteristics and there are no associated simultaneous constraints between those different areas of the system
 - Allows for the ISO to capture additional benefits of load diversity across a larger geographic footprint

Maximum Import Capability Allocation Methodology

Modification to MIC allocation methodology

- ISO has identified need to revisit MIC allocation methodology
- ISO proposes to limit initial allocations of MIC capability to sub-regions of ISO that would be defined by the Regional TAC sub-regions
- Allocations of MIC would be load ratio share basis for LSEs serving load within specified sub-regional areas
- What does this mean?
 - Current BAA keeps its current MIC allocations
 - PacifiCorp system would keep all MIC capability created by its system and would be allocated by load ratio share of LSEs in that area only

Each sub-region would keep its capability in initial allocation of MIC

- LSEs in the current BAA will still be receiving similar allocations of MIC capability that are made available by the current BAA interties today
 - Same current BAA LSEs would only be able to nominate MIC on those interties into the current BAA (sub-regional TAC area)
- LSEs serving load within the PacifiCorp footprint will receive all of the MIC capability that is provided by PacifiCorp system's capability
 - LSEs in that sub-region would only be able to nominate for additional MIC allocation only on interties into that PacifiCorp sub-region area

Split MIC allocations to each sub-region limits ability of LSEs to use MIC in other sub-regions

- Proposal will still allow for LSEs to utilize MIC in other sub-regions of the ISO under Step 8 (Transfer of Import Capability) of MIC allocation process
 - Additional MIC in other sub-regions can still be bilaterally transferred between any LSE in any sub-region under this step
- Under Step 13 (Requests for Balance of Year Unassigned Available Import Capability) of MIC allocation process all remaining MIC capability yet to be assigned would be open for nomination by all LSEs in all areas of the entire expanded ISO BAA

Proposal balances MIC allocation needs

- Splitting of the initial allocations combined with the ability to bilaterally transfer MIC between the Regional TAC sub-regions and the final Step 13 ability to nominate any remaining MIC anywhere in the footprint will balance MIC allocation method needs
- Maintains fair initial MIC allocations to sub-regions
- Allows flexibility to allow all LSEs some ability to bring system RA imports to the system across any interties in an expanded BAA in order to realize the benefits of a larger geographic footprint

Both MIC calculation and allocation tweaks may need to be revisited in the future but are the best path now

- Both proposals for adjustments to MIC calculation and allocation are intended to address the immediate needs of an expanded BAA as well as align with regional TAC proposals
- ISO believes that it may be necessary to consider a more comprehensive MIC redesign in the future
 - A comprehensive MIC redesign could take over one year to complete a SH process and would not be feasible within the timeframe of this initiative

PG&E will present their views on MIC proposals

RA Unit Outage Substitution Rules for Internal and External Resources

Chris Devon

Senior Infrastructure Policy Developer

Tariff does not allow external resources to substitute for internal resources

- Tariff currently requires that RA capacity from an internal system RA resource (internal non-local RA resource) that has experienced an outage requiring substitution be substituted with capacity from a different internal RA resource
- Generally has been sufficient internal resources available for substitution when internal RA resources experience outage so this restriction has not caused any major concern previously
- ISO believes that in the future this limitation could limit the pool of replacement resources for entities in an expanded BAA

Expanded BAA may have difficulty finding additional available internal resources to substitute

- Limited pool of internal RA system resources as well as the utilization of more pseudo-tied resources may cause some difficulty for finding substitute resources when an internal RA resource experiences outage requiring substitution
- In non-contiguous systems there are some resources that will be pseudo-tied to the expanded BAA, but these resources are currently considered to be external resources and require MIC (not qualifying for substitution for internal resources)

Stakeholders comments on external substitution

- Many commenters support the ISO proposal to allow external resources to substitute for internal resources if specified criteria are met
- Some commenters believe that external resources do not provide the same operating characteristics as a physically identical internal resource due to the granularity of the dispatchability of internal versus external resources
- Some commenters believe that non-resource specific imports should also be eligible to provide substitution

Proposal would allow external RA resources to substitute for internal RA resources

- Proposing to remove the current restriction in the ISO tariff in order to allow for external RA resources to be substituted for internal RA resources
- This change would require some conditions in order to allow for reliable substitution

Conditions for substitution of internal RA resources with external RA resources

- ISO previously proposed to allow an external resource to substitute for an internal resource outage as long as the substitution meets the following conditions:
 1. External resource has similar operating characteristics of the outage resource
 2. External resource/entity has sufficient MIC allocation to be used for substitution
 3. External resource has the capability to fulfill the RA must-offer obligation of the outage resource
 - If the internal RA resource has a 24x7 must-offer obligation, then the substitute resource allocation on the required Interties would be required to fulfill a 24x7 must-offer obligation

How should the ISO further consider the similar operating characteristics requirement?

- Some stakeholders have questioned the need for this criteria
 - How would the ISO determine the substitute has similar characteristics?
 - This was raised by stakeholders at the prior meeting
 - System RA should be interchangeable throughout the footprint
 - There is currently no formal requirement that internal resources being substituted for System RA with a different internal have similar operating characteristics as the resource on outage
 - Ability to use any resource as substitute is still at the ISO's discretion to approve or deny any specific unit substitution

Discussion of Import Resources that Qualify for RA Purposes

Discussion of import resources that qualify for RA - background

- ISO has determined it would be beneficial to clarify requirements for RA imports, including how “firm” commitments should be, and has added this item to scope of the initiative
- Current rules allow LSEs to meet RA system capacity requirements using imported resources, and these imported resources do not have to be tied to a specific physical resource
- ISO tariff is not specific on types of imported resources that can count as RA capacity to meet a RA system capacity requirement

Stakeholder comments on imports for RA

- Some commenters support the current RA tariff that allows an LSE to procure an import resource with available MIC utilizing an unspecified source without a need to show the terms or requirements associated with the resource
- Definition of “firm” should be consistent with energy and capacity products sold in the West and considered firm and should apply to all resources used for resource adequacy purposes in the CAISO footprint
- Some commenters believe these determinations should be left to the relevant LRAs
- Some commenters state that how a supplier effectively hedges these must-offer obligations with “firm” or other market purchases is up to the supplier and should not necessarily implicate the ISO

Stakeholder comments on imports for RA (continued)

- Some commenters very concerned about potential impact to reliability and market from allowing an LSE to meet its RA obligations through a contract which is not supported by specific physical resources
- May be a needs to explore some type of transition (grandfathering) period over which LSE's are able to wind down use of firm energy contracts
- Some commenters question if any lack of specificity to date has undermined RA and believe if existing capacity procurement rules have not resulted in unavailability resources when needed then adding eligibility rules may limit flexibility and create a compliance burden
- Some commenters believe that allowing for differing capacity contract commitments for imports from a subset of LSEs creates potential for adversely impacting system reliability and disadvantaging LSEs that meet higher contract commitments

What issues surrounding imports for RA need to be considered?

- Import system RA amounts shown on many RA system showings and supply plans represent firm capacity contracts.
- Last time we asked SH's these questions:
 - Should there be a role for bilateral spot market purchases or short term firm market purchases procured at market hubs outside of BAA to meet a portion of an LSE's requirements?
 - If there is a role or these sorts of products to be used for RA purposes:
 - How much of an LSEs requirement could be met with them?
 - How far ahead of the delivery month must they be established?
 - How should firmness be defined?
- **Import resources qualifying for RA purposes must be able to ensure system reliability needs**

What types of import resources or products should be allowed to qualify for RA?

- Resource specific
- Non-Resource Specific:
 - Aggregate “systems”, i.e., group of hydroelectric resources grouped into one “system” of resources with the group of specific resources identified?
 - Short-term firm market or bilateral energy purchases backed by firm transmission service?
 - Spot market energy purchases backed by firm transmission service?
- Resource Adequacy is intended to allow for the reliable planning and operation of the system
 - If any types of energy purchases are allowed they should be considered firm commitments to deliver energy to the ISO system

If some level of energy purchases could be counted for RA then how much should be allowed?

- Stakeholders asked for analysis and clear criteria to determine if or how much could be relied upon for RA purposes but it is unclear how this could be analyzed
 - How could the ISO actually analyze the reliability that would be provided with various levels of these energy transactions being used to meet RA requirements?
- Allowing different areas to use different levels of these type of transactions could lead to leaning concerns
 - How could the ISO mitigate these concerns if stakeholders believe that these transactions should count for RA purposes?

If any energy transactions are allowed to count for RA then how far in advance must they be established?

- The ISO's RA construct is based upon month-ahead showings
 - Would it be appropriate to allow for showings of energy transactions to be counted on RA showings made in the month ahead timeframe (T-45 days)?
 - Would it still be appropriate if these import transactions or resources have not been contracted, purchased, or otherwise secured for delivery to the ISO system in that same advance timeframe?
 - If stakeholders believe that some level of flexibility should be allowed in securing these resources “intra-month” but prior to the energy market runs, then how would the ISO be able to ensure those import transactions would actually occur if the energy backing the showing has not been established and secured by firm transmission service in advance?

How firm must the transmission service backing imports for RA need to be?

- If some level of firm energy purchases were counted for RA purposes it will be important to ensure the transmission service backing the transaction is firm
 - NERC Priority 7 Transmission Service
 - Similar to Schedule C Western Power Pool Service Firm Capacity/Energy Sales
 - Some examples of transmission service priority are included below

NERC TLR Procedure: Transmission Service Reservation Priorities

Priority	Acronym	Name
0	NX	Next-hour Market Service
1	NS	Service over secondary receipt and delivery points
2	NH	Hourly Service
3	ND	Daily Service
4	NW	Weekly Service
5	NM	Monthly Service
6	NN	Network Integration Transmission Service from sources not designated as network resources
7	F	Firm Point-to-Point Transmission
	FN	Network Integration Transmission Service from Designated Resources

<http://www.nerc.com/pa/rrm/TLR/Pages/Transmission-Service-Reservation-Priorities-.aspx>

CAISO - WECC Unscheduled Flow Reduction Guideline

Priority	Acronym	Transmission Service/Product Type
0	NX	Group 1 – (code 0-NX) off-path
		Group 2 – on-path
1	NS	Group 3 – (code 1-NS) off-path
		Group 4 – on-path
2	NH	Group 5 – (code 2-NH) off-path
		Group 6 – on-path
3	ND	Group 7 – Priority 3 (code 3-ND) off-path
		Group 8 – Priority 3 on-path
4	NW	Group 9 – Priority 4 (code 4-NW) off-path
		Group 10 – Priority 4 on-path
5	NM	Group 11 – Priority 5 (code 5-NM) off-path
		Group 12 – Priority 5 on-path
6	NN / CF	Group 13 – Priority 6 (codes 6-NN and 6-CF) off-path
		Group 14 – Priority 6 on-path
7	F	Group 15 – Priority 7 (codes 7-F and 7-FN) off-path
	FN	Group 16 – Priority 7 on-path

<https://www.caiso.com/Documents/3510A.pdf>

Uniform Counting Methodologies Proposal

Karl Meeusen, Ph.D.

Senior Advisor – Infrastructure Policy

The ISO proposes to develop uniform counting methodologies for system capacity resources

- Standard counting methodologies allows the ISO to consistently determine the maximum capacity value for purposes of the ISO system reliability assessment
- Counting methodologies will be determined through a transparent and open stakeholder process
- LRAs may develop their own counting rules for state procurement/policy objectives
 - Proposed counting rule apply only to ISO assessments
- All capacity values will be subject to an ISO deliverability assessment

Scope of the ISO Uniform Counting Rules proposal

- Counting rules would apply to ISO reliability assessment and local capacity studies
- No changes to flexible capacity product and/or rules will be considered here
 - Any changes to the flexible capacity product and/or counting rules will be addressed in the Flexible Resource Adequacy Criteria and Must-Offer Obligation – Phase 2 stakeholder initiative (FRACMOO2)

The ISO proposes to use the following capacity counting methodologies

1. P_{max}: The maximum power output a resource can reach as established by an ISO conducted P_{max} test.
2. Effective Load Carrying Capability (ELCC): A probabilistic assessment to determine the likelihood that the ISO would be unable to serve load
3. Historical Data: The monthly historic performance during that same month using a three-year rolling average.
4. Registered Capacity Value: A process by which supply-side demand response or load based resources inform the ISO the amount of capacity it will provide
5. Sustainable Energy Output Test: A test to ensure energy limited resources are able to provide a sustained output for a defined period of time

Eligibility to use Pmax for capacity value

- An evaluation of a resource's maximum output which is verified by the ISO
 - Resource must sustain output at Pmax for one hour
- ISO proposed to use this option for:
 - Thermal: Nuclear, natural gas, oil, coal, geothermal, biomass, and biogas
 - Excludes Qualifying Facilities
 - Participating hydro
- New resources of these types must conduct a Pmax test prior to receiving a capacity value

The ISO proposes to utilize an ELCC methodology for solar and wind resources

- ISO will develop an ELCC methodology to determine uniform counting rules for wind and solar resources
- ELCC values will be established based on an assessment of entire ISO footprint
- May consider ELCC for other resource types in the future
- ISO will utilize exceedance methodology if ELCC methodology is not completed prior to annual reliability assessment

The ISO proposes to utilize an ELCC methodology for solar and wind resources (cont.)

- ISO will conduct a separate stakeholder process to determine most specific details of an ELCC study
- Are there elements of an ELCC study that are critical enough that they must be determined prior to the ISO's initial FERC filing?
 - Converting annual ELCC values to monthly capacity values
 - Establishing correct LOLE levels
 - Methods for developing load profile and/or resource portfolios

Historical methodology

- The historical methodology is a resource's monthly historic performance during that same month during the Availability Assessment Hours, using a three-year rolling average
- The ISO proposes to use the historical methodology for
 - Run-of-the-river hydro
 - Qualifying facilities including Combine Heat and Power
- Resources with missing data due to outages occurring during the availability assessment hours will use average values for the same hours on the same calendar day but from other years

What are the availability assessment hours?

- The Availability Assessment Hours are a pre-defined set of five consecutive hours that –
 - A. Correspond to high demand conditions
 - When RA capacity is most needed for system reliability
 - B. Vary by season to align coincident peak load hours with the five-hour range each day during the month,
 - Based on historical actual load data; and
 - C. Apply to each all non-holiday weekdays

Current availability assessment hours*

Month	Hour Ending	Exclusions
January – March November – December	HE 17 - 21	Saturday, Sunday and federal holidays
April – October	HE 14 - 18	

* Availability Assessment Hours may be reassessed annual and are subject to change each year

Registered Capacity Value

- The ISO proposes to use registered capacity value for load based capacity products such as:
 - PDR
 - RDRR
 - Participating Load
- Scheduling coordinator for resource submits the capacity value
- Capacity value should be based on a resource ability sustain output (i.e. load reduction) for four hours
- ISO will accept and establish as the resource's capacity value subject to resource performance audit

Performance audit and unannounced compliance testing for registered capacity value resources

- The ISO may conduct performance audits
 - i.e. Review of actual performance relative to dispatch instruction and registered capacity value
- The ISO may conduct audits for any months the resource has
 - Been shown as a capacity resource and
 - Received an ISO dispatch
- The ISO may conduct random compliance testing for all resources with a registered capacity value during months in which it has been shown as a capacity resource
- Participating load resources will be tested through the Resource Performance Verification process which
 - test resources providing ancillary services

If a resource fails a performance audit or compliance test

- The ISO proposes to send a warning notification to the SC, its respective LRA, and FERC
 - The resource will be flagged for six calendar months from the audit/test date
- If the resource fails another audit or a compliance test within the six month period, the resource
 - The ISO will also derate the capacity value for that resource for the remainder of the year
 - It must provide replacement capacity or be subject to availability charges
 - The resource's registered capacity value will be lowered for the following RA year

Sustained Energy Output Test

- Evaluate capacity value of an energy-limited resource by testing the resource's sustained output over a four-hour period
 - Non-generator resource (NGR)
 - Pumped hydro
- Resource could substitute an actual four-hour dispatch from the previous 12 months as a demonstration of capacity value
- The test would require the resource to provide four hours of continuous output to determine its maximum sustainable discharge capability in order to establish the capacity value
 - Ensures ISO has sufficient energy output to cover peak load conditions plus uncertainty range

Next Steps

- ISO requests stakeholders provide written comments on any of the topics discussed during today's working group by **July 29:**
 - A comments template with specific questions on each issue covered today will be posted within the next few days and will be available on the ISO website at:
<http://www.caiso.com/informed/Pages/StakeholderProcesses/RegionalResourceAdequacy.aspx>
- Initiative Contact: Chris Devon – cdevon@caiso.com