



California ISO

# Resource Adequacy Enhancements Issue Paper

Stakeholder Meeting  
October 30, 2018

# Agenda

<b>Time</b>	<b>Topic</b>	<b>Presenter</b>
9:00 – 9:10	Welcome and introduction	Jody Cross
9:10 – 9:25	Introduction and overview	Karl Meeusen
9:25 – 10:00	RA counting and eligibility rules	Chris Devon and Karl Meeusen
10:00 – 10:20	Review of resource adequacy import capability provisions	Chris Devon
10:20 – 10:35	Rules for RA imports	Chris Devon
10:35 – 10:55	Must offer obligations, substitution rules, and RAAIM	Karl Meeusen
10:55 – 11:10	System and flexible capacity assessments and adequacy tests	Karl Meeusen
11:10 – 11:40	Meeting local resource adequacy needs	Lauren Carr
11:40 – 11:55	CPM and RMR Review	Karl Meeusen
11:55 – 12:00	Next steps and conclusion	Jody Cross

# Stakeholder Process



# Stakeholder Engagement Plan

Date	Milestone
Oct 22	Issue paper
Oct 29	Stakeholder call on issue paper
Nov 12	Stakeholder comments on issue paper due
Dec 20	Straw proposal (part one)
Early Jan	Hold stakeholder meeting on straw proposal (part one)
Late Jan	Stakeholder comments on straw proposal (part one) due
Early Feb	Straw proposal (part two)
Late Feb	Stakeholder meeting on straw proposal (part two)
Early Mar	Stakeholder comments on straw proposal (part two) due
Apr 9-10	Working group meeting
Apr 22	Stakeholder comments on working group meeting due
May 20	Revised straw proposal
May 28-29	Stakeholder meeting on revised straw proposal
Jun 10	Stakeholder comments on revised straw proposal due
Jul 8	Second revised straw proposal
Jul 16-17	Stakeholder meeting on second revised straw proposal
Jul 31	Stakeholder comments on second revised straw proposal due
Sep 9	Draft final proposal
Sep 24-25	Stakeholder meeting on draft final proposal
Oct-9	Stakeholder comments on draft final proposal due
Nov 13	<b>Present proposal to ISO Board</b>



# Introduction and overview

Karl Meeusen, Ph.D.

Senior Advisor – Infrastructure and Regulatory Policy

October 30, 2018

# Rapid transformation to a cleaner, more variable and energy limited fleet necessitates reexamination of the ISO's RA processes and tariff

- At the onset of the RA program
  - Fleet was primarily gas fired generation paired with a large quantity of hydroelectric resources
  - Some resources subject to use-limitations, but generally available to produce energy when and where needed
- Fleet is transitioning to one that can achieve the objectives of SB 100 (i.e. eligible renewable energy resources and zero-carbon resources supply 100% of retail sales to end-use customers)
- ISO must rely on very different portfolio to reliably operate the grid

**This stakeholder initiative will explore holistic reforms needed to the ISO's resource adequacy rules, requirements, and processes to ensure the future reliability and operability of the grid**

# CPUC is developing a multiyear local RA framework in its RA proceeding

- ISO is an active participant in this proceeding
- Much of what the CPUC is contemplating will require minimal or no ISO tariff modifications
  - ISO will maintain its existing backstop authority
- ISO will continue to assess the CPUC's multiyear RA framework to determine if new ISO tariff provisions are needed

# The ISO has identified numerous aspects of its current RA tariff authority that must be updated

The following issues are of growing concern to the ISO:

- The current RA counting rules do not adequately reflect resource availability
  - Relying on complicated replacement and availability incentive mechanism rules
- Flexible capacity counting rules may not sufficiently align with system and locational operational needs
- Available import capability and allocation may result in inefficient outcomes and withholding of import capabilities
- RA eligibility rules and MOOs for import resources may provide opportunities for economic withholding and/or non-delivery of energy



# The ISO has identified numerous aspects of its current RA tariff authority that must be updated

The following issues are of growing concern to the ISO:

- System and flexible RA assessments do not consider the overall ability of the RA fleet to meet ISO operational needs
- Growing reliance on availability limited resources to serve local capacity areas
  - Resources may not have sufficient run hours or dispatches to ensure local reliability
- Local capacity backstop procurement cost allocation does not contemplate the effectiveness of the local RA resources
  - Including effectiveness factors and expected energy output at peak for a local capacity area

## ISO plans to seek approval from the ISO Board only for this initiative

- Initiative is focused on ISO RA planning, procurement, and performance obligations
  - Applies only to LSEs serving load in the ISO BAA and the resources procured to serve that load
- Falls outside the scope of the EIM Governing Body's advisory role
  - Does not propose changes to either real-time market rules or rules that govern all ISO markets
- ISO seeks stakeholder feedback on this proposed decisional classification for the initiative



# RA counting and eligibility rules

Chris Devon

Senior Infrastructure and Regulatory Policy Developer

Karl Meeusen, Ph.D.

Senior Advisor – Infrastructure and Regulatory Policy

October 30, 2018

# SYSTEM RA COUNTING AND ELIGIBILITY RULES

Chris Devon

Senior Infrastructure and Regulatory Policy Developer

# System RA counting and eligibility background

- The ISO defers to the CPUC and other LRAs to determine Qualifying Capacity (QC) values for resources interconnected to the ISO system
  - The methods applied for QC evaluations are commonly known as RA counting rules
- Section 40 of the ISO Tariff defers RA counting rules and setting resource qualifying capacity values to Local Regulatory Authorities (LRAs)
- The ISO takes the QC values and develops Net Qualifying Capacity (NQC) values
  - NQC process can result in potential resource qualifying capacity value reductions due to resource testing (Section 40.4.4), performance criteria (Section 40.4.5), and deliverability (Section 40.4.6)

# The ISO proposes to review RA counting and eligibility provisions for RA resource NQC adjustments

- The ISO proposes the following issues be in-scope:
  - Application of Effective Forced Outage Rate (EFOR) performance criteria, or other performance related adjustments, including potential accompanying NQC adjustments
  - Review and clarification of RA counting rules for RA resources
- Any consideration of system RA counting rules beyond the NQC adjustments described above are out of scope for this initiative

# Interdependencies with other elements in this initiative

- The potential changes considered in-scope for this element of the proposal may have some dependency and interrelation on other potential modifications considered in this initiative, including:
  - Review of the RAIM provisions,
  - Outage substitution/replacement rules, and
  - Potential implementation of alternative capacity performance penalties

# FLEXIBLE RA COUNTING AND ELIGIBILITY RULES

Karl Meeusen, Ph.D.

Senior Advisor – Infrastructure and Regulatory Policy



# The ISO will continue exploring enhanced flexible RA counting rules from the FRACMOO2 stakeholder process

- ISO will continue assessing the operational capabilities required from the fleet
  - *i.e.* flexible capability to address uncertainty between market runs
- Must align with
  - Day-Ahead Market Enhancements (DAME)
  - Extended Day Ahead Market (EDAM)
- Must determine what flexible RA counting rule changes may be needed to support market changes and operational needs

# The ISO plans to complete the DAME policy by late Q2 2019 and start EDAM by mid-2019

- DAME stakeholder initiative
  - Phase 1 –15-minute day ahead market (Q1 2019)
  - Phase 2 – day-ahead flexible capacity product (Q2 2019)
- EDAM to commence in the middle of 2019
  - Develop market rules that allow EIM entities to participate in the ISO's day-ahead market

## RA must ensure ISO is able to meet a resource sufficiency evaluation

- EIM entities must provide sufficient resources to meet their forecast load and imbalance requirements
- Allows benefit of economic transfers in EIM and EDAM
  - EIM includes hourly resource sufficiency evaluation requiring each BAA to:
    - Have sufficient economic bids to independently balance its supply and demand
    - Not inappropriately lean on others capacity, flexibility, and transmission capability
- If an entity fails the resource sufficiency evaluation, transfers into/out of the BAA are limited
- Each BAA must offer sufficient capacity and economic bids to be able to meet obligations independently



# Review of resource adequacy import capability provisions

Chris Devon

Senior Infrastructure and Regulatory Policy Developer

October 30, 2018

# Resource Adequacy import capability background

- Each year, the ISO establishes maximum import capability (MIC) values for import paths, and allocates MIC to scheduling coordinators for LSEs in the ISO BAA for resource adequacy purposes
- The ISO calculates available import capability for each intertie by using historical import schedule data during peak load periods for the prior two years
- The ISO has also developed a forward-looking methodology, known as expanded maximum import capability used in the ISO transmission planning process
  - This methodology reflects future upgrades to the transmission system and attempts to ensure that sufficient import capability exists to support resource adequacy contracts in future years

# Resource Adequacy import capability background (continued)

- The ISO assigns the total Available Import Capability on an annual basis for a one-year term to Scheduling Coordinators representing LSEs in the ISO BAA
- 13 step allocation process known as the Available Import Capability Assignment Process, is detailed in the ISO tariff, Section 40.4.6.2.1
  - This multi-step process for assignment of Total Import Capability is only used for determining the import capability that can be credited towards satisfying the Reserve Margin of a LSE under Section 40
- Following the 13 step allocation process, LSEs have opportunity to trade their assigned Import Capability with other entities bilaterally
  - This trading opportunity is detailed in the ISO tariff Section 40.4.6.2.2, and is known as the Bilateral Import Capability Transfers and Registration Process

## The ISO proposes to conduct a comprehensive review of resource adequacy Import Capability provisions

- ISO has previously received numerous requests from stakeholders regarding review of the MIC calculation and allocation provisions
- Stakeholders have indicated the ISO should consider alternative MIC calculation methods, as well as suggesting review of challenges presented by current Import Capability Assignment process
- The ISO believes it may also be necessary to consider multi-year Import Capability assessments and allocations as a component of the scope of this comprehensive Import Capability review



# Rules for Resource Adequacy imports

Chris Devon

Senior Infrastructure and Regulatory Policy Developer

October 30, 2018



# Resource Adequacy import rules background

- ISO coordinates with the CPUC, California Energy Commission (CEC) and other local regulatory authorities to set system-level RA requirements
  - System RA requirements are based on LSE's forecasted monthly peak load plus a planning reserve margin, typically 15 percent of monthly peak loads
- LSEs are able to meet their system RA requirements with a mix of RA resources that may include imports from outside of the ISO BAA

## Resource Adequacy import rules background (continued)

- Resource adequacy imports are not required to be resource specific or to represent supply from a specific balancing area, but only that they be on a specific intertie into the ISO system
- Scheduling coordinators are only required to submit energy bids for resource adequacy imports in the day-ahead market
- Imports can be bid at any price and do not have any further obligation to bid into the real-time market if not scheduled or cleared in the day-ahead energy or residual unit commitment process

# Current RA import provisions may need to be revisited

- Previously, some stakeholders expressed concerns with RA import rules potentially allowing some speculative supply to count for RA
  - ISO DMM also issued a special report indicating a concern that RA imports could satisfy RA must offer obligation by routinely bidding significantly above projected prices in day-ahead market to help ensure they do not clear the market, relieving them of any further obligations in real-time
- ISO is concerned about negative impacts related to current RA import provisions, including their impact on the integrity of California's RA program and reliability

# ISO proposes to include a review of RA import rules and provisions in the scope of this initiative

- Includes a reassessment of the requirements and rules for the sources behind RA imports
  - This is increasingly important as the ISO considers extending the day-ahead market to EIM entities to ensure that resources outside of the ISO BA are not double counted in meeting resource sufficiency requirements
- ISO proposes that price caps for import bid submissions are out of scope for this initiative
- Review of RA import rules modifications being considered may be related to review of general RA Must Offer Obligations



# Must offer obligations, substitutions rules, and RAAIM

Karl Meeusen, Ph.D.

Senior Advisor – Infrastructure and Regulatory Policy

October 30, 2018

## ISO will conduct a holistic review of MOOs, RA substitution rules, and RAAIM

- MOOs, RA substitution rules, and RAAIM combine to create a very complicated system of obligations
- Resources providing RA capacity have an obligation to offer their RA capacity into the ISO market
- RA resources taking planned outages may be required to provide substitute capacity or have that outage denied

## ISO will conduct a holistic review of MOOs, RA substitution rules, and RAAIM

- Resources that go on forced outage may be subject to the RAAIM if no substitute capacity provided
- RAAIM provides a disincentive to show capacity beyond the bare minimum RA capacity types and amounts
- Applies only to the Availability Assessment Hours
  - These hours and days differ depending on the RA product the resource is providing the ISO

# ISO will conduct a holistic review of MOOs, RA substitution rules, and RAAIM

- Need for substitution rules and RAAIM
  - Including outages in NQC calculations necessitates a review of substitution rules and current RAAIM construct
- Developing an emergency or event based incentive
  - Could be triggered only under certain grid conditions instead of predetermined hours
- Must Offer Obligation for RA imports
  - Creating comparable obligations between internal and external RA resources
  - Bidding obligations into both day-ahead and real-time markets





# System and flexible capacity assessments and adequacy tests

Karl Meeusen, Ph.D.

Senior Advisor – Infrastructure and Regulatory Policy

October 30, 2018

# The ISO is considering a new tool to assess the adequacy of the system and flexible RA fleet

- The composition of the RA fleet is changing
  - From: Gas fired generation paired with a large quantity of hydroelectric resources
  - To: Preferred resources, including variable energy resources, energy limited resources, and DR, supported by reduced gas and hydro fleet
- To date, the RA program has relied heavily on the CPUC Maximum Cumulative Capacity (MCC) buckets
  - Designed to ensure that CPUC jurisdictional LSEs did not over-rely on use limited resources
- This transition has lead the CPUC's Energy Division staff to question the on-going usefulness of MCC buckets

# Current CPUC MCC buckets

Summary of Resource Categories	
Category	Resources may be categorized into one of the five categories shown below, according to their planned availability as expressed in hours available to run or operate per month (hours/month):
DR	Demand Response resources available for “Greater than or equal to” 24 hours per month.
1	Greater than or equal to the ULR [Use Limited Resource] monthly hours. These are for May through September, respectively: 30, 40, 40, 60, and 40.
2	“Greater than or equal to” 160 hours per month.
3	“Greater than or equal to” 384 hours per month.
4	All Hours (planned availability is unrestricted)

## The ISO is considering a new tool to assess the adequacy of the system and flexible RA fleet (cont.)

- A new assessment tool would align with efforts on NQC counting rules and outage improvements
  - *i.e.* ISO assessment of new NQC counting rules and replacement obligations
- CPUC's transition to ELCC values for wind and solar resources is an important first step towards
- ELCC values for wind and solar are derived using a different fleet than the one that is shown for RA
  - The difference can result in different reliability contributions from wind and solar resources between the studied fleet and the shown RA fleet

# Counting rule enhancements do not fully assess if shown RA fleet is able to meet the ISO's operational needs

- ISO will consider developing a tool to assess all RA showings to ensure they provide adequate system and flexible RA capacity
- Ensure the resource adequacy program provides ISO BAA sufficient generation capacity and flexibility to meet its operational needs independently of other BAAs
  - *i.e.* The ISO is able to meet both EIM and EDAM sufficiency tests



# Meeting local resource adequacy needs

Lauren Carr

Infrastructure and Regulatory Policy Developer

October 30, 2018

# LOCAL CAPACITY ASSESSMENTS WITH AVAILABILITY LIMITED RESOURCES

# Current RA program does not fully consider resources' availability limitations

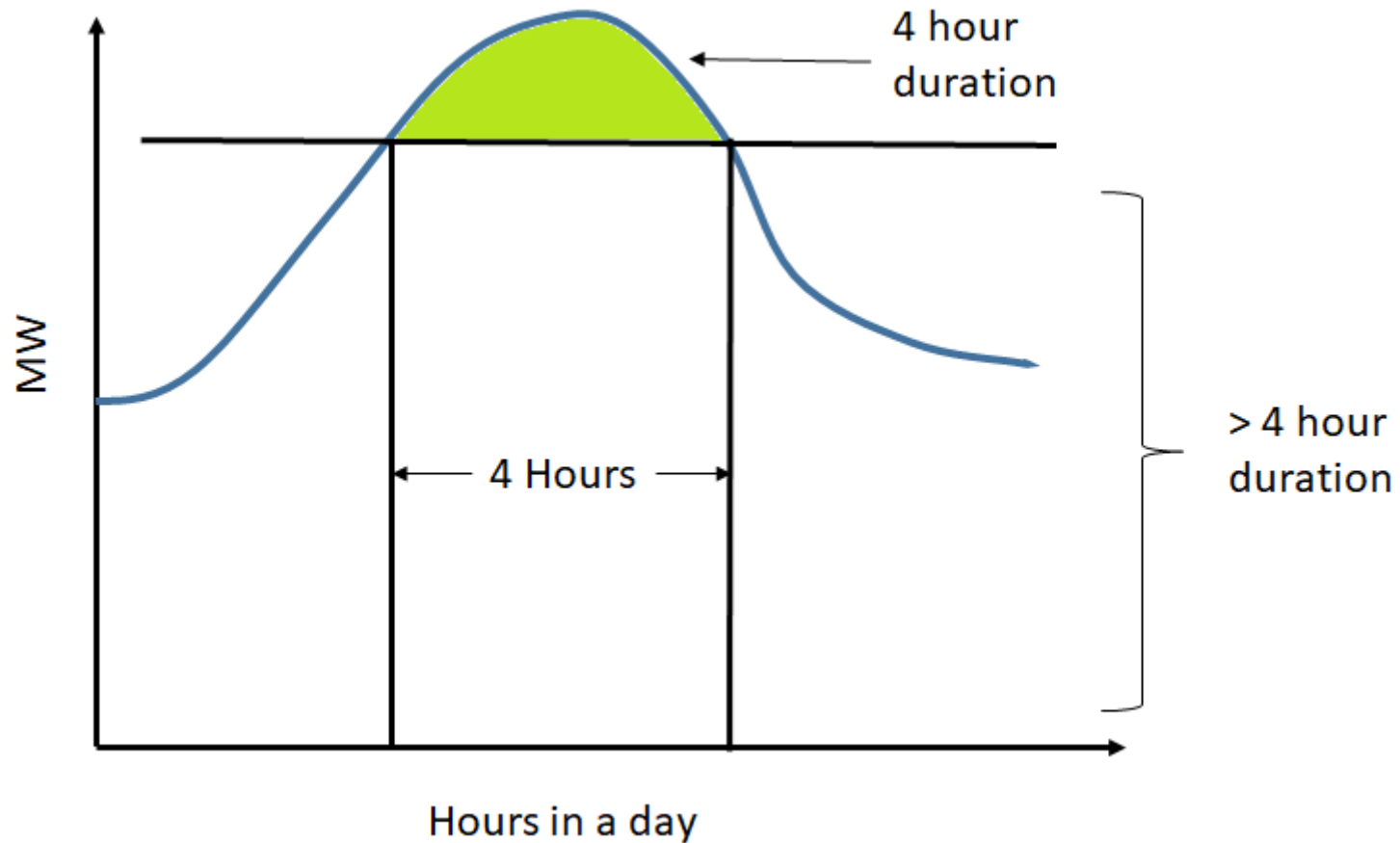
- Availability limited resources have limitations responding to a contingency event in a local area
- These limitations include:
  - Duration hours
  - Event calls
- RA requirements are based on meeting peak capacity needs in MWs



# Examples of valuing RA without considering availability limitations

- Duration limitations
  - 10 MW resource capable of running for 4 hours
  - 10 MW resource capable of running for 8 hours
- Event calls
  - 10 MW resource with 5 event calls per year
  - 10 MW resource with 50 event calls per year
- These resources receive the same RA capacity value even though their availability and capability are different

# Hourly load shape demonstrating four hour minimum availability threshold



## The ISO performs transmission planning studies to determine local area RA procurement needs

- The current study does not consider hourly load and resource analysis
- Moorpark and Santa Clara studies used hourly load and resource analysis to determine if there were binding availability limits in local capacity sub-areas
  - Allowed the ISO to more precisely determine energy needs in local areas
  - Studies showed availability limited resources with a four-hour minimum duration were insufficient in meeting the local area energy (i.e., total MWhs) needs

# Scope of policy examination

- Enhance the ISO's local capacity technical analysis to assess the impact of availability limited resources on local capacity needs

# MEETING LOCAL CAPACITY NEEDS WITH SLOW DEMAND RESPONSE

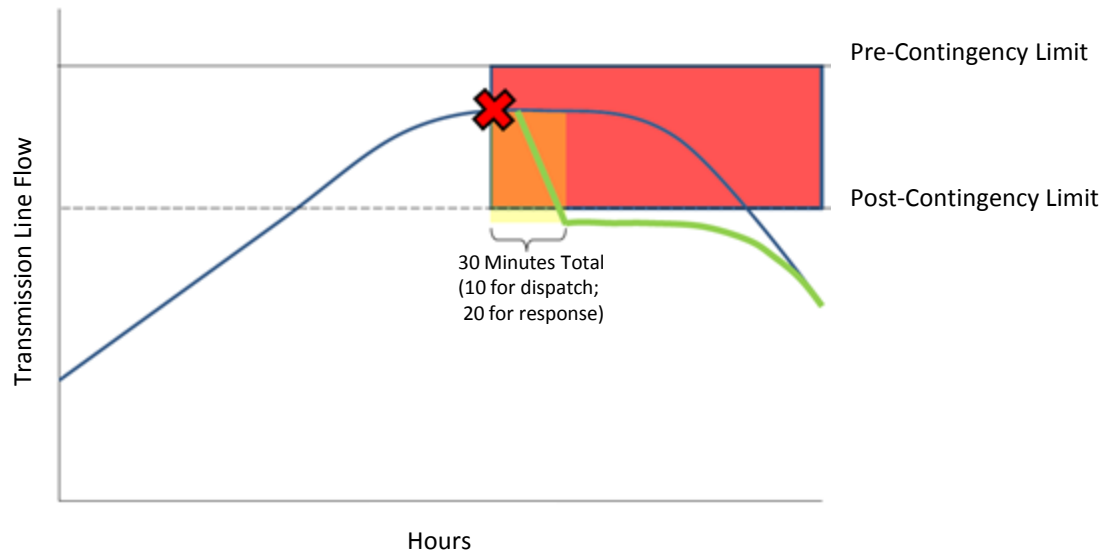
# Background




- Per NERC standards and ISO tariff section 40.3.1.1(1), the ISO must secure the system within 30 minutes of a contingency
- This allows roughly 10 minutes for ISO operators to assess system conditions and 20 minutes for resource dispatch and response
- This required response time impacts DR resources because many cannot respond with 20 minute notification

## Slow DR is not capable of responding to ISO dispatch instructions within 20 minutes

- Slow demand response resources may still help mitigate local area reliability issues
- ISO planning studies indicate current levels of slow DR generally have sufficient availability to count for local RA
  - Excludes limited run-time duration
- Dispatching slow DR resources before a contingency occurs as a preventive measure can allow them to qualify for local RA
- Pre-contingency dispatch may result in DR resources being called upon more frequently

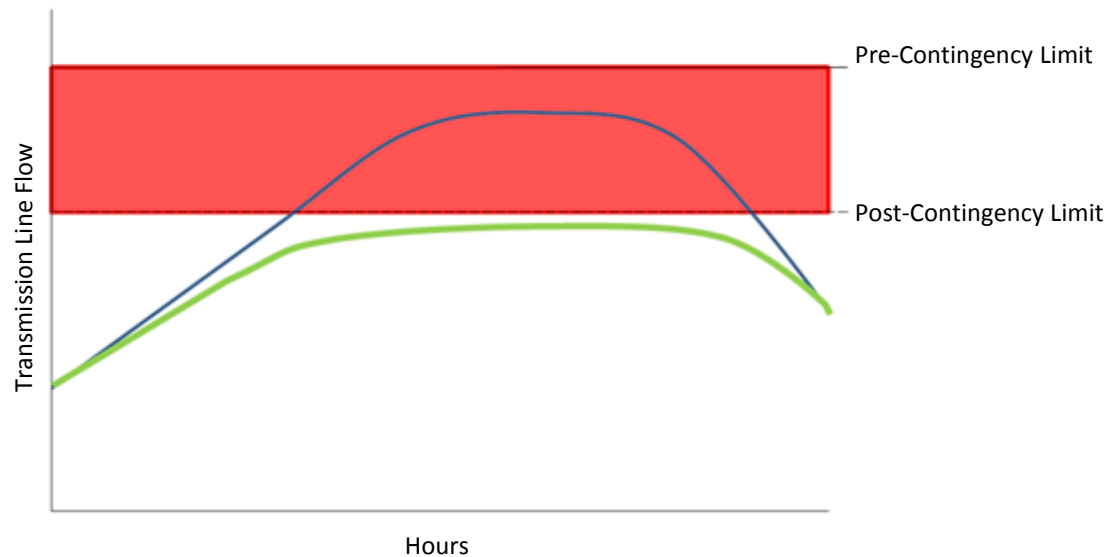
# Resources that can respond with sufficient speed can be dispatched after a contingency to effectively reposition the system within 30 minutes



-  Contingency occurs
-  Pre-contingency line flow
-  DR reduces line flow post-contingency

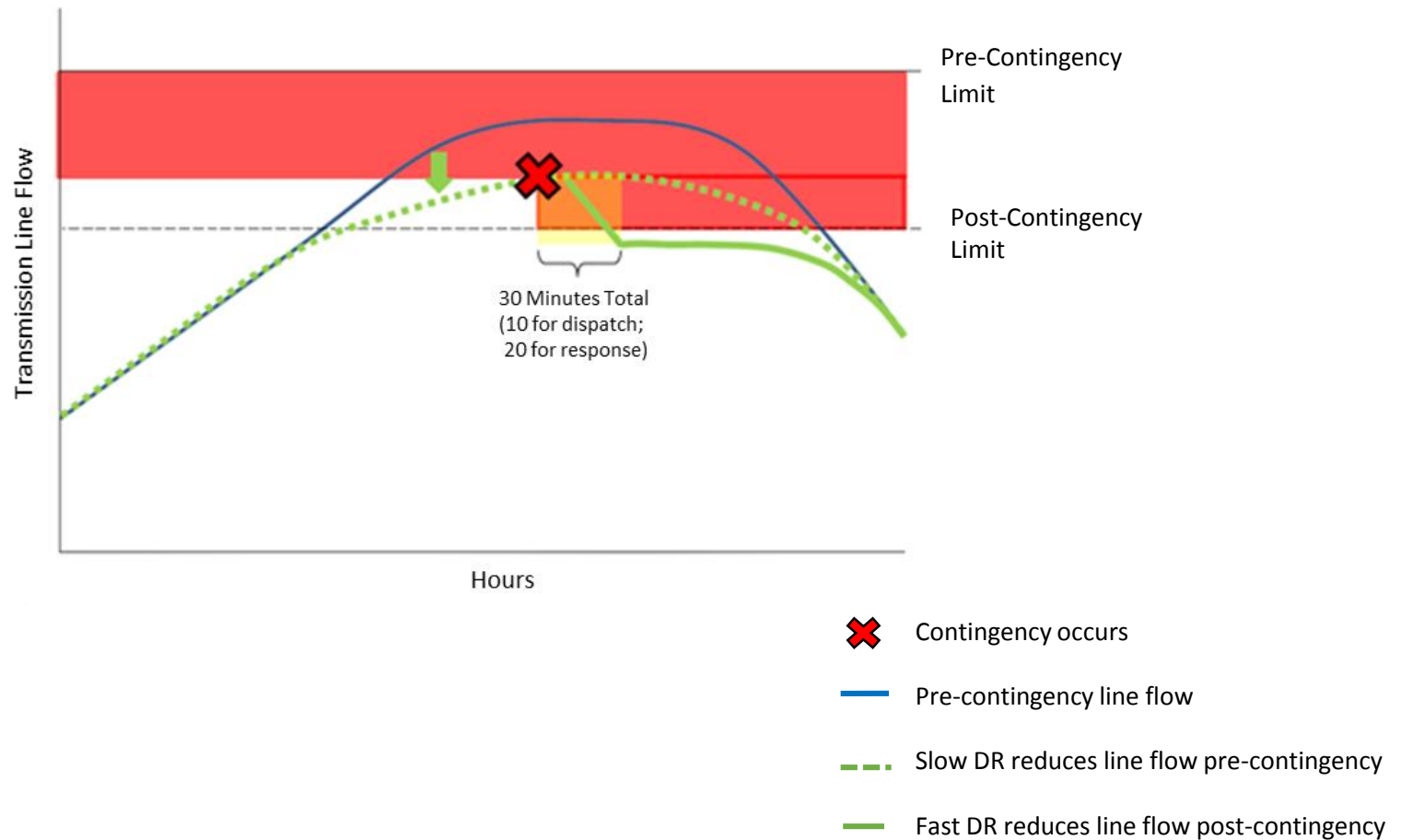


# Slow demand response resources can provide local reliability mitigation if they can be dispatched before a contingency occurs, “in case”



- Pre-contingency line flow
- DR reduces line flow prior to contingency occurring

# A combination of fast and slow resources can work together, provided the slow responding resources are dispatched appropriately



# Scope of examination

- Explore how to best “operationalize” these resources to meet local reliability needs
- Explore how to facilitate the pre-contingency dispatch of these resources through the market
  - To mitigate local area reliability concerns
  - To qualify for local RA
- Does not cover availability limitations of slow DR (this will be covered in availability limited section)



California ISO

# CPM/RMR review

Karl Meeusen, Ph.D.

Senior Advisor – Infrastructure and Regulatory Policy

October 30, 2018

# Multiyear RMR and CPM procurement is not in scope for this initiative

- Currently the ISO is not planning to expand authority for the CPM or RMR backstop mechanisms for multiyear procurement
  - The ISO is currently refining both mechanisms in the RMR-CPM enhancements initiative
  - Additional authority beyond the scope of that initiative is not currently considered necessary

## The ISO is updating BPM language for intermittent resource credit in the local capacity area study

- The ISO is currently updating accounting practices used when performing local capacity area studies
  - These changes and potential impacts will be discussed during this RA enhancements initiative
- New criteria will include performance of intermittent resources during the hour of local peak demand

## Cost allocation for backstop procurement may be considered in this initiative

- Effectiveness factors in local area studies may cause additional procurement
- The ISO will examine how costs should be allocated when there is additional procurement
  - If a particular load serving entity procured resources that are not effective at meeting local requirements, resulting in backstop procurement, it may be appropriate to allocate costs of that procurement to the load serving entity

# The ISO will be submitting essential reliability resources (ERRs) to the CPUC for RA procurement

- Essential reliability resources are resources that the ISO requires to be available to reliably operate the grid
  - A list of these resources will be published for procurement in the RA process
  - The ISO will examine and clarify how ERRs will be procured if not procured as RA through existing ISO backstop procurement authority



# Next steps

- Stakeholder written comments due November 12, 2018
  - Submit to [initiativecomments@caiso.com](mailto:initiativecomments@caiso.com)
  - Comments template posted by COB November 1, 2018
- Straw proposal on part 1 items posted December 20, 2018